APPENDIX 3.5

DEATILED CALCULATION OF PORTAL EMISSIONS

Appendix 3.5 - Emission Inventory for Portal Emissions

Parameters of the Enclosures

Enclosure ID	Description	Road ID Involved	Length of Enclosure	Width of Enclosure	Height of Enclosure	Initial Lateral Dimension [(a)]	Initial Vertical Dimension [(b)]
			(m)	(m)	(m)	(σy)	(σz)
085P1	Wong Chu Road WB	085	227.0	7.0	7.6	3.256	3.535
085P2	Wong Chu Road WB	087	230.3	4.0	7.6	1.860	3.535
085P3	Wong Chu Road WB	088	230.3	8.0	7.6	3.721	3.535
086P1	Wong Chu Road EB	086	105.7	7.0	7.6	3.256	3.535
086P2	Wong Chu Road EB	086	228.8	7.0	7.6	3.256	3.535
103P1	Tuen Mun Road NB	103	183.3	12.0	11.3	5.581	5.256
104P1	Tuen Mun Road SB	104	276.8	12.0	11.3	5.581	5.256
104P2	Tuen Mun Road SB	106	90.9	7.0	11.3	3.256	5.256
104P3	Tuen Mun Road SB	089	90.9	5.0	11.3	2.326	5.256
104P4	Tuen Mun Road SB	123	90.9	5.0	11.3	2.326	5.256
108P1	Tuen Mun Road SB	108	118.5	18.0	8.0	8.372	3.721
109P1	Tuen Mun Road SB	109	182.8	18.0	8.0	8.372	3.721

Notes:

(a) Initial Lateral Dimension as suggested in "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised (EPA-454/R-92-019, October 1992)": Initial Lateral Dimension = Width of Enclosure ÷ 2.15.

(b) Initial Vertical Dimension as suggested in "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised (EPA-454/R-92-019, October 1992)": Initial Vertical Dimension = Height of Enclosure ÷ 2.15.

Appendix 3.5 - Emission Inventory for Portal Emissions

Input Parameters in AERMOD

Portal ID	Enclosure ID	Description	Road Section Located	X-Coordinate	Y-Coordinate	Base mPD	Release Height [(a)]	Vertical Noise Barrier/ Enclosure Adjustment	Release Height in Model	Initial Lateral Dimension	Initial Vertical Dimension
				(HK1980)	(HK1980)	(mPD)	(mAG)	(m)	(mAG)	(σy)	(σz)
085A01	085P1	1st 50m of portal	085	815484.90	827393.80	11.80	3.80	3.00	6.80	3.256	3.535
085A02	085P1	1st 50m of portal	085	815491.90	827394.40	11.80	3.80	3.00	6.80	3.256	3.535
085A03	085P1	1st 50m of portal	085	815498.80	827395.10	11.80	3.80	3.00	6.80	3.256	3.535
085A04	085P1	1st 50m of portal	085	815505.80	827395.70	11.80	3.80	3.00	6.80	3.256	3.535
085A05	085P1	1st 50m of portal	085	815512.80	827396.30	11.80	3.80	3.00	6.80	3.256	3.535
085A06	085P1	1st 50m of portal	085	815519.80	827397.00	11.80	3.80	3.00	6.80	3.256	3.535
085A07	085P1	1st 50m of portal	085	815526.70	827397.60	11.80	3.80	3.00	6.80	3.256	3.535
085A08	085P1	2nd 50m of portal	085	815533.70	827398.30	11.80	3.80	3.00	6.80	3.256	3.535
085A09	085P1	2nd 50m of portal	085	815540.70	827398.90	11.80	3.80	3.00	6.80	3.256	3.535
085B01	085P2	1st 50m of portal	087	815776.60	827441.40	7.00	3.80	7.00	10.80	1.860	3.535
085B02	085P2	1st 50m of portal	087	815780.40	827442.60	7.00	3.80	7.00	10.80	1.860	3.535
085B03	085P2	1st 50m of portal	087	815784.20	827443.80	7.00	3.80	7.00	10.80	1.860	3.535
085B04	085P2	1st 50m of portal	087	815788.00	827445.00	7.00	3.80	7.00	10.80	1.860	3.535
085B05	085P2	1st 50m of portal	087	815791.80	827446.30	7.00	3.80	7.00	10.80	1.860	3.535
085B06	085P2	1st 50m of portal	087	815795.60	827447.50	7.00	3.80	7.00	10.80	1.860	3.535
085B07	085P2	1st 50m of portal	087	815799.40	827448.70	7.00	3.80	7.00	10.80	1.860	3.535
085B08	085P2	1st 50m of portal	087	815803.20	827450.00	7.00	3.80	7.00	10.80	1.860	3.535
085B09	085P2	1st 50m of portal	087	815806.90	827451.50	7.00	3.80	7.00	10.80	1.860	3.535
085B10	085P2	1st 50m of portal	087	815810.50	827453.00	7.00	3.80	7.00	10.80	1.860	3.535
085B11	085P2	1st 50m of portal	087	815813.80	827455.30	7.00	3.80	7.00	10.80	1.860	3.535
085B12	085P2	1st 50m of portal	087	815817.10	827457.50	7.00	3.80	7.00	10.80	1.860	3.535
085B13	085P2	1st 50m of portal	087	815820.40	827459.80	7.00	3.80	7.00	10.80	1.860	3.535
085B14	085P2	1st 50m of portal	087	815823.70	827462.10	7.00	3.80	7.00	10.80	1.860	3.535
085B15	085P2	1st 50m of portal	087	815826.90	827464.90	7.00	3.80	7.00	10.80	1.860	3.535
085B16	085P2	1st 50m of portal	087	815830.00	827467.80	7.00	3.80	7.00	10.80	1.860	3.535
085B17	085P2	2nd 50m of portal	087	815832.60	827470.80	7.00	3.80	7.00	10.80	1.860	3.535
085B18	085P2	2nd 50m of portal	087	815835.20	827473.80	7.00	3.80	7.00	10.80	1.860	3.535
085B19	085P2	2nd 50m of portal	087	815837.70	827476.90	7.00	3.80	7.00	10.80	1.860	3.535
085B20	085P2	2nd 50m of portal	087	815840.30	827480.00	7.00	3.80	7.00	10.80	1.860	3.535
085B21	085P2	2nd 50m of portal	087	815842.90	827483.00	5.10	3.80	7.00	10.80	1.860	3.535
085B22	085P2	2nd 50m of portal	087	815845.50	827486.50	5.10	3.80	7.00	10.80	1.860	3.535
085B23	085P2	2nd 50m of portal	087	815848.00	827490.00	5.10	3.80	7.00	10.80	1.860	3.535
085B24	085P2	2nd 50m of portal	087	815849.60	827493.60	5.10	3.80	7.00	10.80	1.860	3.535
085B25	085P2	2nd 50m of portal	087	815851.20	827497.30	5.10	3.80	7.00	10.80	1.860	3.535
085B26	085P2	2nd 50m of portal	087	815852.80	827500.90	5.10	3.80	7.00	10.80	1.860	3.535
085B27	085P2	2nd 50m of portal	087	815854.50	827504.60	5.10	3.80	7.00	10.80	1.860	3.535
085B28	085P2	2nd 50m of portal	087	815855.80	827508.70	5.10	3.80	7.00	10.80	1.860	3.535
085B29	085P2	2nd 50m of portal	087	815857.20	827512.70	5.10	3.80	7.00	10.80	1.860	3.535
085B30	085P2	2nd 50m of portal	087	815857.90	827516.70	5.10	3.80	7.00	10.80	1.860	3.535
085B31	085P2	2nd 50m of portal	087	815858.70	827520.60	5.10	3.80	7.00	10.80	1.860	3.535
085C01	085P3	1st 50m of portal	088	815779.80	827437.00	7.00	3.80	3.00	6.80	3.721	3.535
085C02	085P3	1st 50m of portal	088	815787.80	827436.90	7.00	3.80	3.00	6.80	3.721	3.535
085C03	085P3	1st 50m of portal	088	815795.80	827436.90	7.00	3.80	3.00	6.80	3.721	3.535
085C04	085P3	1st 50m of portal	088	815803.80	827436.80	8.60	3.80	3.00	6.80	3.721	3.535
085C05	085P3	1st 50m of portal	088	815811.90	827436.80	8.60	3.80	3.00	6.80	3.721	3.535
085C06	085P3	1st 50m of portal	088	815819.80	827436.70	8.60	3.80	3.00	6.80	3.721	3.535
085C07	085P3	1st 50m of portal	088	815828.20	827435.30	8.60	3.80	3.00	6.80	3.721	3.535
085C08	085P3	2nd 50m of portal	088	815836.60	827433.70	8.60	3.80	3.00	6.80	3.721	3.535
085C09	085P3	2nd 50m of portal	088	815844.20	827431.40	8.60	3.80	3.00	6.80	3.721	3.535
085C10	085P3	2nd 50m of portal	088	815851.90	827429.00	8.60	3.80	3.00	6.80	3.721	3.535
085C11	085P3	2nd 50m of portal	088	815859.60	827426.70	12.20	3.80	3.00	6.80	3.721	3.535
085C12	085P3	2nd 50m of portal	088	815867.20	827423.30	12.20	3.80	3.00	6.80	3.721	3.535
085C13	085P3	2nd 50m of portal	088	815874.80	827419.80	12.20	3.80	3.00	6.80	3.721	3.535
086A01	086P1	1st 50m of portal	086	815545.50	827389.50	11.80	3.80	3.00	6.80	3.256	3.535
086A02	086P1	1st 50m of portal	086	815538.60	827388.90	11.80	3.80	3.00	6.80	3.256	3.535
086A03	086P1	1st 50m of portal	086	815531.60	827388.30	11.80	3.80	3.00	6.80	3.256	3.535
086A04	086P1	1st 50m of portal	086	815524.60	827387.80	11.80	3.80	3.00	6.80	3.256	3.535
086A05	086P1	1st 50m of portal	086	815517.70	827387.20	11.80	3.80	3.00	6.80	3.256	3.535
086A06	086P1	1st 50m of portal	086	815510.70	827386.60	11.80	3.80	3.00	6.80	3.256	3.535
086A07	086P1	1st 50m of portal	086	815503.70	827386.10	11.80	3.80	3.00	6.80	3.256	3.535
086A08	086P1	2nd 50m of portal	086	815496.70	827385.50	11.80	3.80	3.00	6.80	3.256	3.535
086A09	086P1	2nd 50m of portal	086	815489.70	827384.90	11.80	3.80	3.00	6.80	3.256	3.535

Appendix 3.5 - Emission Inventory for Portal Emissions

Input Parameters in AERMOD

Portal ID	Enclosure ID	Description	Road Section Located	X-Coordinate	Y-Coordinate	Base mPD	Release Height [(a)]	Vertical Noise Barrier/ Enclosure Adjustment	Release Height in Model	Initial Lateral Dimension	Initial Vertical Dimension
				(HK1980)	(HK1980)	(mPD)	(mAG)	(m)	(mAG)	(σy)	(σz)
086B01	086P2	1st 50m of portal	086	815249.62	827391.40	5.40	3.80	5.00	8.80	3.256	3.535
086B02	086P2	1st 50m of portal	086	815242.09	827392.45	5.40	3.80	5.00	8.80	3.256	3.535
086B03	086P2	1st 50m of portal	086	815234.57	827393.50	5.40	3.80	5.00	8.80	3.256	3.535
086B04	086P2	1st 50m of portal	086	815227.04	827394.55	5.40	3.80	5.00	8.80	3.256	3.535
086B05	086P2	1st 50m of portal	086	815219.44	827395.71	5.40	3.80	5.00	8.80	3.256	3.535
086B06	086P2	1st 50m of portal	086	815211.94	827396.94	5.40	3.80	5.00	8.80	3.256	3.535
086B07	086P2	1st 50m of portal	086	815204.29	827398.39	5.40	3.80	5.00	8.80	3.256	3.535
086B08	086P2	1st 50m of portal	086	815196.76	827400.15	5.40	3.80	5.00	8.80	3.256	3.535
086B09	086P2	2nd 50m of portal	086	815189.39	827402.01	5.40	3.80	5.00	8.80	3.256	3.535
086B10	086P2	2nd 50m of portal	086	815182.02	827403.87	5.40	3.80	5.00	8.80	3.256	3.535
086B11	086P2	2nd 50m of portal	086	815174.65	827405.73	5.40	3.80	5.00	8.80	3.256	3.535
086B12	086P2	2nd 50m of portal	086	815167.28	827407.59	5.40	3.80	5.00	8.80	3.256	3.535
086B13	086P2	2nd 50m of portal	086	815159.91	827409.45	5.40	3.80	5.00	8.80	3.256	3.535
086B14	086P2	2nd 50m of portal	086	815153.13	827411.19	5.40	3.80	5.00	8.80	3.256	3.535
086B15	086P2	2nd 50m of portal	086	815146.35	827412.92	5.40	3.80	5.00	8.80	3.256	3.535
103A01	103P1	1st 50m of portal	103	815841.90	827636.76	5.60	5.65	11.30	16.95	5.581	5.256
103A02	103P1	1st 50m of portal	103	815839.20	827648.56	5.60	5.65	11.30	16.95	5.581	5.256
103A03	103P1	1st 50m of portal	103	815836.40	827660.16	5.60	5.65	11.30	16.95	5.581	5.256
103A04	103P1	1st 50m of portal	103	815833.60	827671.86	5.60	5.65	11.30	16.95	5.581	5.256
103A05	103P1	1st 50m of portal	103	815830.70	827683.46	5.60	5.65	11.30	16.95	5.581	5.256
103A06	103P1	2nd 50m of portal	103	815827.90	827695.16	5.60	5.65	11.30	16.95	5.581	5.256
103A07	103P1	2nd 50m of portal	103	815825.10	827706.86	5.60	5.65	11.30	16.95	5.581	5.256
103A08	103P1	2nd 50m of portal	103	815822.30	827718.56	5.60	5.65	11.30	16.95	5.581	5.256
104A01	104P1	1st 50m of portal	104	815840.30	827721.19	5.60	5.65	11.30	16.95	5.581	5.256
104A02	104P1	1st 50m of portal	104	815843.10	827709.49	5.60	5.65	11.30	16.95	5.581	5.256
104A03	104P1	1st 50m of portal	104	815846.00	827697.89	5.60	5.65	11.30	16.95	5.581	5.256
104A04	104P1	1st 50m of portal	104	815848.80	827686.19	5.60	5.65	11.30	16.95	5.581	5.256
104A05	104P1	1st 50m of portal	104	815851.60	827674.49	5.60	5.65	11.30	16.95	5.581	5.256
104A06	104P1	2nd 50m of portal	104	815854.40	827662.89	5.60	5.65	11.30	16.95	5.581	5.256
104A07	104P1	2nd 50m of portal	104	815857.20	827651.29	5.60	5.65	11.30	16.95	5.581	5.256
104A08	104P1	2nd 50m of portal	104	815860.10	827639.49	5.60	5.65	11.30	16.95	5.581	5.256
104B01	104P2	1st 50m of portal	106	815878.68	827547.37	4.70	5.65	8.00	13.65	3.256	5.256
104B02	104P2	1st 50m of portal	106	815880.36	827540.57	4.70	5.65	8.00	13.65	3.256	5.256
104B03	104P2	1st 50m of portal	106	815882.03	827533.77	4.70	5.65	8.00	13.65	3.256	5.256
104B04	104P2	1st 50m of portal	106	815883.71	827526.98	4.70	5.65	8.00	13.65	3.256	5.256
104B05	104P2	1st 50m of portal	106	815885.39	827520.18	4.70	5.65	8.00	13.65	3.256	5.256
104B06	104P2	1st 50m of portal	106	815887.07	827513.39	4.70	5.65	8.00	13.65	3.256	5.256
104B07	104P2	1st 50m of portal	106	815888.75	827506.59	4.70	5.65	8.00	13.65	3.256	5.256
104B08	104P2	1st 50m of portal	106	815890.43	827499.80	4.70	5.65	8.00	13.65	3.256	5.256
104B09	104P2	2nd 50m of portal	106	815892.11	827493.00	4.70	5.65	8.00	13.65	3.256	5.256
104B10	104P2	2nd 50m of portal	106	815893.94	827486.12	4.70	5.65	8.00	13.65	3.256	5.256
104B11	104P2	2nd 50m of portal	106	815895.86	827479.39	4.70	5.65	8.00	13.65	3.256	5.256
104B12	104P2	2nd 50m of portal	106	815897.78	827472.65	4.70	5.65	8.00	13.65	3.256	5.256
104B13	104P2	2nd 50m of portal	106	815899.70	827465.92	4.70	5.65	8.00	13.65	3.256	5.256
104B14	104P2	2nd 50m of portal	106	815901.61	827459.19	4.70	5.65	8.00	13.65	3.256	5.256
104B15	104P2	2nd 50m of portal	106	815903.49	827452.45	4.70	5.65	8.00	13.65	3.256	5.256
104C01	104P3	1st 50m of portal	089	815882.85	827549.40	5.20	5.65	-	5.65	2.326	5.256
104C02	104P3	1st 50m of portal	089	815884.09	827544.55	5.20	5.65	-	5.65	2.326	5.256
104C03	104P3	1st 50m of portal	089	815885.33	827539.71	5.20	5.65	-	5.65	2.326	5.256
104C04	104P3	1st 50m of portal	089	815886.57	827534.87	5.20	5.65	-	5.65	2.326	5.256
104C05	104P3	1st 50m of portal	089	815887.81	827530.02	5.20	5.65	-	5.65	2.326	5.256
104C06	104P3	1st 50m of portal	089	815889.05	827525.18	10.98	5.65	-	5.65	2.326	5.256
104C07	104P3	1st 50m of portal	089	815890.29	827520.33	10.98	5.65	-	5.65	2.326	5.256
104C08	104P3	1st 50m of portal	089	815891.53	827515.49	10.98	5.65	-	5.65	2.326	5.256
104C09	104P3	1st 50m of portal	089	815892.77	827510.65	10.98	5.65	-	5.65	2.326	5.256
104C10	104P3	1st 50m of portal	089	815894.01	827505.80	14.16	5.65	-	5.65	2.326	5.256
104C11	104P3	2nd 50m of portal	089	815895.24	827500.96	14.16	5.65	-	5.65	2.326	5.256
104C12	104P3	2nd 50m of portal	089	815896.48	827496.11	14.16	5.65	-	5.65	2.326	5.256
104C13	104P3	2nd 50m of portal	089	815897.72	827491.27	14.16	5.65	-	5.65	2.326	5.256
104C14	104P3	2nd 50m of portal	089	815898.77	827486.14	14.96	5.65	-	5.65	2.326	5.256
104C15	104P3	2nd 50m of portal	089	815899.45	827481.07	14.96	5.65	-	5.65	2.326	5.256
104C16	104P3	2nd 50m of portal	089	815899.78	827475.86	14.96	5.65	-	5.65	2.326	5.256
104C17	104P3	2nd 50m of portal	089	815899.87	827470.86	14.96	5.65	-	5.65	2.326	5.256
104C18	104P3	2nd 50m of portal	089	815899.96	827465.87	14.96	5.65	-	5.65	2.326	5.256
104C19	104P3	2nd 50m of portal	089	815900.05	827460.87	16.54	5.65	-	5.65	2.326	5.256
104C20	104P3	2nd 50m of portal	089	815899.77	827455.53	16.54	5.65	-	5.65	2.326	5.256

Appendix 3.5 - Emission Inventory for Portal Emissions

Input Parameters in AERMOD

Portal ID	Enclosure ID	Description	Road Section Located	X-Coordinate	Y-Coordinate	Base mPD	Release Height [(a)]	Vertical Noise Barrier/ Enclosure Adjustment	Release Height in Model	Initial Lateral Dimension	Initial Vertical Dimension
				(HK1980)	(HK1980)	(mPD)	(mAG)	(m)	(mAG)	(σy)	(σz)
104D01	104P4	1st 50m of portal	123	815887.19	827550.52	5.20	5.65	8.30	13.95	2.326	5.256
104D02	104P4	1st 50m of portal	123	815888.43	827545.68	5.20	5.65	8.30	13.95	2.326	5.256
104D03	104P4	1st 50m of portal	123	815889.67	827540.84	5.20	5.65	8.30	13.95	2.326	5.256
104D04	104P4	1st 50m of portal	123	815890.91	827535.99	5.20	5.65	8.30	13.95	2.326	5.256
104D05	104P4	1st 50m of portal	123	815892.15	827531.15	5.20	5.65	8.30	13.95	2.326	5.256
104D06	104P4	1st 50m of portal	123	815893.39	827526.30	10.98	5.65	8.30	13.95	2.326	5.256
104D07	104P4	1st 50m of portal	123	815894.63	827521.46	10.98	5.65	8.30	13.95	2.326	5.256
104D08	104P4	1st 50m of portal	123	815895.86	827516.62	10.98	5.65	8.30	13.95	2.326	5.256
104D09	104P4	1st 50m of portal	123	815897.10	827511.77	10.98	5.65	8.30	13.95	2.326	5.256
104D10	104P4	1st 50m of portal	123	815898.34	827506.93	14.16	5.65	8.30	13.95	2.326	5.256
104D11	104P4	2nd 50m of portal	123	815899.58	827502.08	14.16	5.65	8.30	13.95	2.326	5.256
104D12	104P4	2nd 50m of portal	123	815900.82	827497.24	14.16	5.65	8.30	13.95	2.326	5.256
104D13	104P4	2nd 50m of portal	123	815902.06	827492.40	14.16	5.65	8.30	13.95	2.326	5.256
104D14	104P4	2nd 50m of portal	123	815903.30	827487.55	14.96	5.65	8.30	13.95	2.326	5.256
104D15	104P4	2nd 50m of portal	123	815904.47	827482.59	14.96	5.65	8.30	13.95	2.326	5.256
104D16	104P4	2nd 50m of portal	123	815905.52	827477.70	14.96	5.65	8.30	13.95	2.326	5.256
104D17	104P4	2nd 50m of portal	123	815906.57	827472.82	14.96	5.65	8.30	13.95	2.326	5.256
104D18	104P4	2nd 50m of portal	123	815907.62	827467.93	14.96	5.65	8.30	13.95	2.326	5.256
104D19	104P4	2nd 50m of portal	123	815908.68	827463.04	14.96	5.65	8.30	13.95	2.326	5.256
104D20	104P4	2nd 50m of portal	123	815909.73	827458.15	14.96	5.65	8.30	13.95	2.326	5.256
108A01	108P1	1st 50m of portal	108	815998.90	827221.20	14.20	4.00	-	4.00	8.372	3.721
108A02	108P1	2nd 50m of portal	108	816008.00	827205.70	14.20	4.00	-	4.00	8.372	3.721
108A03	108P1	2nd 50m of portal	108	816017.00	827190.10	14.20	4.00	-	4.00	8.372	3.721
109A01	109P1	1st 50m of portal	109	816144.40	827019.40	27.20	4.00	-	4.00	8.372	3.721
109A02	109P1	1st 50m of portal	109	816157.50	827006.80	27.20	4.00	-	4.00	8.372	3.721
109A03	109P1	1st 50m of portal	109	816169.70	826994.60	30.20	4.00	-	4.00	8.372	3.721
109A04	109P1	2nd 50m of portal	109	816182.50	826981.90	31.00	4.00	-	4.00	8.372	3.721
109A05	109P1	2nd 50m of portal	109	816195.40	826969.30	31.00	4.00	-	4.00	8.372	3.721
109A06	109P1	2nd 50m of portal	109	816208.20	826956.60	32.40	4.00	-	4.00	8.372	3.721

Notes:

(a) Release Height is referenced from AERMOD User's Guide (USEPA,2022). Release Height = Height of Enclosure ÷ 2.

(b) Initial Lateral Dimension is referenced from AERMOD User's Guide (USEPA,2022). Initial Lateral Dimension = Width of Enclosure ÷ 2.15.

(c) Initial Vertical Dimension is referenced from AERMOD User's Guide (USEPA,2022). Initial Vertical Dimension = Height of Enclosure ÷ 2.15.

(d) Portal emissions from Enclosure 085P1 (085A01 to 085A09) were assumed to be emitted from the top of the noise barriers where located at the end of noise enclosure, an adjustment of +3m (top of noise enclosure) was included in the model release height.

(e) Portal emissions from Enclosure 085P2 (085B01 to 085A31) were assumed to be emitted from the edge of the noise semi-enclosure where located at the left-side end of noise enclosure, an adjustment of +7m (top of noise semi-enclosure) was included in the model release height.

(f) Portal emissions from Enclosure 085P3 (085C01 to 085C13) were assumed to be emitted from the top of the noise barriers where located at the right-side end of noise enclosure, an adjustment of +3m (top of noise enclosure) was included in the model release height.

(g) Portal emissions from Enclosure 086P1 (086A01 to 086A09) were assumed to be emitted from the top of the noise barriers where located at the end of noise enclosure, an adjustment of +3m (top of noise enclosure) was included in the model release height.

(h) Portal emissions from Enclosure 086P2 (086B01 to 086B15) were assumed to be emitted from the top edge of the noise cantilevers where located at the end of noise enclosure, an adjustment of +5m (top of noise enclosure) was included in the model release height.

(i) Portal emissions from Enclosure 103P1 (103A01 to 103A08) were assumed to be emitted from the top of the noise enclosure, an adjustment of +11.5m (top of noise enclosure) was included in the model release height.

(j) Portal emissions from Enclosure 104P1 (104A01 to 104A08) were assumed to be emitted from the top of the noise enclosure, an adjustment of +11.5m (top of noise enclosure) was included in the model release height.

(k) Portal emissions from Enclosure 104P2 (104B01 to 104B15) were assumed to be emitted from the top edge of the noise cantilevers where located at the end of noise enclosure, an adjustment of +8m (top of noise enclosure) was included in the model release height.

(l) Portal emissions from Enclosure 104P4 (104D01 to 104D20) were assumed to be emitted from the top edge of the noise cantilevers where located at the end of noise enclosure, an adjustment of +8m (top of noise enclosure) was included in the model release height.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2796	0.2350	0.2384	0.2496	0.2579	0.4835	0.5109	0.4435	0.4467	0.4277	0.4187	0.4131	0.3762	0.3679	0.3748	0.4004	0.4122	0.4257	0.4360	0.4136	0.3711	0.3530	0.3518	0.3243
	NO2	g/vehicle/km	0.0497	0.0478	0.0474	0.0486	0.0499	0.0615	0.0625	0.0670	0.0795	0.0763	0.0739	0.0719	0.0730	0.0705	0.0728	0.0773	0.0800	0.0831	0.0859	0.0822	0.0722	0.0661	0.0655	0.0611
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0146***	***0.0100***	***0.0069***	***0.0054***	***0.0047***	***0.0109***	***0.0246***	***0.0519***	***0.0774***	***0.0719***	***0.0645***	***0.0610***	***0.0535***	***0.0489***	***0.0528***	***0.0593***	***0.0639***	***0.0711***	***0.0770***	***0.0700***	***0.0516***	***0.0403***	***0.0375***	***0.0305***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.71E-03	6.64E-03	4.62E-03	3.58E-03	3.11E-03	7.28E-03	1.64E-02	3.46E-02	5.16E-02	4.79E-02	4.30E-02	4.07E-02	3.56E-02	3.26E-02	3.52E-02	3.96E-02	4.26E-02	4.74E-02	5.13E-02	4.67E-02	3.44E-02	2.68E-02	2.50E-02	2.03E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.85E-03	3.32E-03	2.31E-03	1.79E-03	1.56E-03	3.64E-03	8.21E-03	1.73E-02	2.58E-02	2.40E-02	2.15E-02	2.03E-02	1.78E-02	1.63E-02	1.76E-02	1.98E-02	2.13E-02	2.37E-02	2.57E-02	2.33E-02	1.72E-02	1.34E-02	1.25E-02	1.02E-02
	Emission in each Box of 1st jet	g/s	1.39E-03	9.48E-04	6.60E-04	5.11E-04	4.44E-04	1.04E-03	2.34E-03	4.94E-03	7.38E-03	6.85E-03	6.15E-03	5.81E-03	5.09E-03	4.65E-03	5.03E-03	5.65E-03	6.09E-03	6.77E-03	7.33E-03	6.67E-03	4.91E-03	3.83E-03	3.57E-03	2.90E-03
	Emission in each Box of 2nd jet	g/s	2.43E-03	1.66E-03	1.15E-03	8.95E-04	7.78E-04	1.82E-03	4.10E-03	8.64E-03	1.29E-02	1.20E-02	1.08E-02	1.02E-02	8.91E-03	8.14E-03	8.81E-03	9.89E-03	1.07E-02	1.18E-02	1.28E-02	1.17E-02	8.60E-03	6.71E-03	6.24E-03	5.08E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0010***	***0.0009***	***0.0014***	***0.0030***	***0.0078***	***0.0138***	***0.0128***	***0.0114***	***0.0106***	***0.0104***	***0.0094***	***0.0103***	***0.0115***	***0.0124***	***0.0139***	***0.0152***	***0.0139***	***0.0100***	***0.0075***	***0.0070***	***0.0057***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.73E-03	1.35E-03	9.19E-04	6.97E-04	6.02E-04	9.25E-04	2.01E-03	5.22E-03	9.19E-03	8.55E-03	7.59E-03	7.08E-03	6.92E-03	6.24E-03	6.84E-03	7.64E-03	8.27E-03	9.25E-03	1.01E-02	9.28E-03	6.69E-03	5.02E-03	4.65E-03	3.83E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.63E-04	6.75E-04	4.59E-04	3.49E-04	3.01E-04	4.63E-04	1.00E-03	2.61E-03	4.60E-03	4.28E-03	3.79E-03	3.54E-03	3.46E-03	3.12E-03	3.42E-03	3.82E-03	4.14E-03	4.62E-03	5.05E-03	4.64E-03	3.35E-03	2.51E-03	2.33E-03	1.91E-03
	Emission in each Box of 1st jet	g/s	2.47E-04	1.93E-04	1.31E-04	9.96E-05	8.60E-05	1.32E-04	2.87E-04	7.46E-04	1.31E-03	1.22E-03	1.08E-03	1.01E-03	9.89E-04	8.91E-04	9.77E-04	1.09E-03	1.18E-03	1.32E-03	1.44E-03	1.33E-03	9.56E-04	7.18E-04	6.65E-04	5.47E-04
	Emission in each Box of 2nd jet	g/s	4.32E-04	3.38E-04	2.30E-04	1.74E-04	1.51E-04	2.31E-04	5.02E-04	1.31E-03	2.30E-03	2.14E-03	1.90E-03	1.77E-03	1.73E-03	1.56E-03	1.71E-03	1.91E-03	2.07E-03	2.31E-03	2.53E-03	2.32E-03	1.67E-03	1.26E-03	1.16E-03	9.57E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2558	0.2139	0.2161	0.2275	0.2417	0.4589	0.4873	0.4194	0.4232	0.4101	0.4028	0.3955	0.3590	0.3467	0.3556	0.3812	0.3922	0.4003	0.4005	0.3794	0.3386	0.3229	0.3220	0.2964
	NO2	g/vehicle/km	0.0460	0.0442	0.0437	0.0451	0.0475	0.0588	0.0600	0.0639	0.0760	0.0737	0.0715	0.0693	0.0702	0.0670	0.0697	0.0742	0.0766	0.0787	0.0796	0.0761	0.0665	0.0611	0.0606	0.0565
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0133***	***0.0091***	***0.0063***	***0.0049***	***0.0044***	***0.0104***	***0.0235***	***0.0490***	***0.0734***	***0.0690***	***0.0621***	***0.0584***	***0.0510***	***0.0460***	***0.0501***	***0.0565***	***0.0608***	***0.0668***	***0.0707***	***0.0643***	***0.0471***	***0.0368***	***0.0343***	***0.0279***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.88E-03	6.04E-03	4.19E-03	3.26E-03	2.92E-03	6.91E-03	1.56E-02	3.27E-02	4.89E-02	4.60E-02	4.14E-02	3.89E-02	3.40E-02	3.07E-02	3.34E-02	3.77E-02	4.05E-02	4.46E-02	4.71E-02	4.28E-02	3.14E-02	2.45E-02	2.29E-02	1.86E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.44E-03	3.02E-03	2.09E-03	1.63E-03	1.46E-03	3.45E-03	7.82E-03	1.63E-02	2.45E-02	2.30E-02	2.07E-02	1.95E-02	1.70E-02	1.53E-02	1.67E-02	1.88E-02	2.03E-02	2.23E-02	2.36E-02	2.14E-02	1.57E-02	1.23E-02	1.14E-02	9.28E-03
	Emission in each Box of 1st jet	g/s	1.27E-03	8.63E-04	5.98E-04	4.66E-04	4.17E-04	9.87E-04	2.24E-03	4.67E-03	6.99E-03	6.57E-03	5.91E-03	5.56E-03	4.86E-03	4.39E-03	4.78E-03	5.38E-03	5.79E-03	6.37E-03	6.73E-03	6.12E-03	4.48E-03	3.51E-03	3.27E-03	2.65E-03
	Emission in each Box of 2nd jet	g/s	2.22E-03	1.51E-03	1.05E-03	8.15E-04	7.29E-04	1.73E-03	3.91E-03	8.17E-03	1.22E-02	1.15E-02	1.03E-02	9.73E-03	8.50E-03	7.67E-03	8.36E-03	9.41E-03	1.01E-02	1.11E-02	1.18E-02	1.07E-02	7.84E-03	6.13E-03	5.72E-03	4.64E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0009***	***0.0013***	***0.0029***	***0.0075***	***0.0132***	***0.0124***	***0.0110***	***0.0102***	***0.0100***	***0.0089***	***0.0098***	***0.0110***	***0.0119***	***0.0131***	***0.0140***	***0.0129***	***0.0092***	***0.0070***	***0.0065***	***0.0053***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.60E-03	1.25E-03	8.46E-04	6.46E-04	5.73E-04	8.85E-04	1.93E-03	4.98E-03	8.79E-03	8.25E-03	7.35E-03	6.82E-03	6.65E-03	5.94E-03	6.55E-03	7.33E-03	7.92E-03	8.76E-03	9.36E-03	8.59E-03	6.17E-03	4.65E-03	4.30E-03	3.54E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.99E-04	6.24E-04	4.23E-04	3.23E-04	2.86E-04	4.43E-04	9.63E-04	2.49E-03	4.39E-03	4.13E-03	3.67E-03	3.41E-03	3.33E-03	2.97E-03	3.27E-03	3.67E-03	3.96E-03	4.38E-03	4.68E-03	4.30E-03	3.08E-03	2.32E-03	2.15E-03	1.77E-03
	Emission in each Box of 1st jet	g/s	2.28E-04	1.78E-04	1.21E-04	9.23E-05	8.18E-05	1.26E-04	2.75E-04	7.11E-04	1.26E-03	1.18E-03	1.05E-03	9.74E-04	9.50E-04	8.48E-04	9.35E-04	1.05E-03	1.13E-03	1.25E-03	1.34E-03	1.23E-03	8.81E-04	6.64E-04	6.15E-04	5.05E-04
	Emission in each Box of 2nd jet	g/s	4.00E-04	3.12E-04	2.11E-04	1.62E-04	1.43E-04	2.21E-04	4.82E-04	1.24E-03	2.20E-03	2.06E-03	1.84E-03	1.71E-03	1.66E-03	1.48E-03	1.64E-03	1.83E-03	1.98E-03	2.19E-03	2.34E-03	2.15E-03	1.54E-03	1.16E-03	1.08E-03	8.84E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2582	0.2138	0.2163	0.2280	0.2374	0.4480	0.4722	0.4131	0.4156	0.3984	0.3826	0.3766	0.3413	0.3341	0.3400	0.3647	0.3770	0.3887	0.3985	0.3799	0.3430	0.3238	0.3281	0.3032
	NO2	g/vehicle/km	0.0465	0.0443	0.0438	0.0452	0.0467	0.0575	0.0582	0.0630	0.0747	0.0717	0.0682	0.0663	0.0671	0.0649	0.0669	0.0713	0.0740	0.0767	0.0793	0.0763	0.0674	0.0614	0.0617	0.0577
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0134***	***0.0091***	***0.0063***	***0.0049***	***0.0043***	***0.0101***	***0.0227***	***0.0483***	***0.0720***	***0.0670***	***0.0590***	***0.0556***	***0.0485***	***0.0444***	***0.0479***	***0.0540***	***0.0585***	***0.0649***	***0.0703***	***0.0643***	***0.0477***	***0.0369***	***0.0349***	***0.0285***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.96E-03	6.04E-03	4.19E-03	3.27E-03	2.86E-03	6.74E-03	1.52E-02	3.22E-02	4.80E-02	4.47E-02	3.93E-02	3.71E-02	3.23E-02	2.96E-02	3.20E-02	3.60E-02	3.90E-02	4.33E-02	4.69E-02	4.29E-02	3.18E-02	2.46E-02	2.33E-02	1.90E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.48E-03	3.02E-03	2.10E-03	1.63E-03	1.43E-03	3.37E-03	7.58E-03	1.61E-02	2.40E-02	2.23E-02	1.97E-02	1.85E-02	1.62E-02	1.48E-02	1.60E-02	1.80E-02	1.95E-02	2.16E-02	2.34E-02	2.14E-02	1.59E-02	1.23E-02	1.16E-02	9.50E-03
	Emission in each Box of 1st jet	g/s	1.28E-03	8.63E-04	5.99E-04	4.67E-04	4.09E-04	9.63E-04	2.17E-03	4.60E-03	6.86E-03	6.38E-03	5.62E-03	5.29E-03	4.62E-03	4.23E-03	4.57E-03	5.15E-03	5.57E-03	6.18E-03	6.70E-03	6.13E-03	4.54E-03	3.52E-03	3.33E-03	2.71E-03
	Emission in each Box of 2nd jet	g/s	2.24E-03	1.51E-03	1.05E-03	8.17E-04	7.16E-04	1.69E-03	3.79E-03	8.05E-03	1.20E-02	1.12E-02	9.83E-03	9.27E-03	8.09E-03	7.39E-03	7.99E-03	9.01E-03	9.74E-03	1.08E-02	1.17E-02	1.07E-02	7.94E-03	6.15E-03	5.82E-03	4.75E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0013***	***0.0028***	***0.0074***	***0.0130***	***0.0121***	***0.0105***	***0.0098***	***0.0095***	***0.0086***	***0.0094***	***0.0106***	***0.0115***	***0.0128***	***0.0140***	***0.0129***	***0.0094***	***0.0070***	***0.0066***	***0.0054***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.61E-03	1.25E-03	8.49E-04	6.48E-04	5.63E-04	8.65E-04	1.87E-03	4.91E-03	8.64E-03	8.04E-03	7.01E-03	6.52E-03	6.36E-03	5.74E-03	6.29E-03	7.04E-03	7.65E-03	8.53E-03	9.34E-03	8.61E-03	6.25E-03	4.67E-03	4.38E-03	3.62E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.07E-04	6.25E-04	4.24E-04	3.24E-04	2.82E-04	4.33E-04	9.35E-04	2.45E-03	4.32E-03	4.02E-03	3.50E-03	3.26E-03	3.18E-03	2.87E-03	3.14E-03	3.52E-03	3.82E-03	4.27E-03	4.67E-03	4.31E-03	3.12E-03	2.33E-03	2.19E-03	1.81E-03
	Emission in each Box of 1st jet	g/s	2.31E-04	1.79E-04	1.21E-04	9.26E-05	8.05E-05	1.24E-04	2.67E-04	7.01E-04	1.23E-03	1.15E-03	1.00E-03	9.32E-04	9.09E-04	8.20E-04	8.98E-04	1.01E-03	1.09E-03	1.22E-03	1.33E-03	1.23E-03	8.92E-04	6.67E-04	6.26E-04	5.17E-04
	Emission in each Box of 2nd jet	g/s	4.04E-04	3.13E-04	2.12E-04	1.62E-04	1.41E-04	2.16E-04	4.68E-04	1.23E-03	2.16E-03	2.01E-03	1.75E-03	1.63E-03	1.59E-03	1.44E-03	1.57E-03	1.76E-03	1.91E-03	2.13E-03	2.33E-03	2.15E-03	1.56E-03	1.17E-03	1.10E-03	9.04E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 085A01-085A09
Enclosure Involvec: 085P1
Road Located: 085
Vehicle EF Adopte: 085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2378	0.1992	0.2035	0.2144	0.2236	0.4263	0.4565	0.4130	0.4136	0.3983	0.3881	0.3777	0.3371	0.3309	0.3331	0.3575	0.3711	0.3773	0.3816	0.3592	0.3213	0.3026	0.3005	0.2721
	NO2	g/vehicle/km	0.0432	0.0416	0.0416	0.0429	0.0443	0.0549	0.0565	0.0631	0.0745	0.0718	0.0693	0.0666	0.0665	0.0644	0.0657	0.0701	0.0730	0.0747	0.0763	0.0725	0.0636	0.0577	0.0569	0.0522
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0124***	***0.0084***	***0.0059***	***0.0046***	***0.0040***	***0.0096***	***0.0220***	***0.0483***	***0.0717***	***0.0670***	***0.0598***	***0.0558***	***0.0479***	***0.0439***	***0.0470***	***0.0530***	***0.0575***	***0.0630***	***0.0673***	***0.0608***	***0.0447***	***0.0345***	***0.0320***	***0.0256***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.26E-03	5.63E-03	3.94E-03	3.07E-03	2.70E-03	6.42E-03	1.47E-02	3.22E-02	4.78E-02	4.46E-02	3.99E-02	3.72E-02	3.19E-02	2.93E-02	3.13E-02	3.53E-02	3.84E-02	4.20E-02	4.49E-02	4.06E-02	2.98E-02	2.30E-02	2.13E-02	1.70E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.13E-03	2.81E-03	1.97E-03	1.54E-03	1.35E-03	3.21E-03	7.33E-03	1.61E-02	2.39E-02	2.23E-02	1.99E-02	1.86E-02	1.60E-02	1.46E-02	1.57E-02	1.77E-02	1.92E-02	2.10E-02	2.24E-02	2.03E-02	1.49E-02	1.15E-02	1.07E-02	8.52E-03
	Emission in each Box of 1st jet	g/s	1.18E-03	8.04E-04	5.63E-04	4.39E-04	3.85E-04	9.17E-04	2.09E-03	4.60E-03	6.83E-03	6.38E-03	5.70E-03	5.31E-03	4.56E-03	4.18E-03	4.47E-03	5.05E-03	5.48E-03	6.00E-03	6.41E-03	5.79E-03	4.25E-03	3.29E-03	3.05E-03	2.44E-03
	Emission in each Box of 2nd jet	g/s	2.06E-03	1.41E-03	9.86E-04	7.68E-04	6.74E-04	1.60E-03	3.67E-03	8.05E-03	1.19E-02	1.12E-02	9.97E-03	9.29E-03	7.99E-03	7.32E-03	7.83E-03	8.83E-03	9.59E-03	1.05E-02	1.12E-02	1.01E-02	7.44E-03	5.75E-03	5.33E-03	4.26E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0027***	***0.0074***	***0.0129***	***0.0121***	***0.0107***	***0.0098***	***0.0094***	***0.0085***	***0.0093***	***0.0104***	***0.0113***	***0.0125***	***0.0135***	***0.0123***	***0.0088***	***0.0066***	***0.0061***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.50E-03	1.18E-03	8.05E-04	6.15E-04	5.35E-04	8.27E-04	1.81E-03	4.92E-03	8.61E-03	8.05E-03	7.12E-03	6.55E-03	6.30E-03	5.70E-03	6.17E-03	6.93E-03	7.54E-03	8.31E-03	8.97E-03	8.18E-03	5.89E-03	4.38E-03	4.04E-03	3.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.50E-04	5.88E-04	4.03E-04	3.08E-04	2.67E-04	4.13E-04	9.07E-04	2.46E-03	4.31E-03	4.03E-03	3.56E-03	3.28E-03	3.15E-03	2.85E-03	3.09E-03	3.46E-03	3.77E-03	4.16E-03	4.49E-03	4.09E-03	2.94E-03	2.19E-03	2.02E-03	1.64E-03
	Emission in each Box of 1st jet	g/s	2.14E-04	1.68E-04	1.15E-04	8.79E-05	7.64E-05	1.18E-04	2.59E-04	7.03E-04	1.23E-03	1.15E-03	1.02E-03	9.36E-04	9.00E-04	8.14E-04	8.82E-04	9.89E-04	1.08E-03	1.19E-03	1.28E-03	1.17E-03	8.41E-04	6.26E-04	5.78E-04	4.68E-04
	Emission in each Box of 2nd jet	g/s	3.75E-04	2.94E-04	2.01E-04	1.54E-04	1.34E-04	2.07E-04	4.53E-04	1.23E-03	2.15E-03	2.01E-03	1.78E-03	1.64E-03	1.57E-03	1.42E-03	1.54E-03	1.73E-03	1.89E-03	2.08E-03	2.24E-03	2.05E-03	1.47E-03	1.10E-03	1.01E-03	8.18E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2291	0.1859	0.1870	0.1947	0.2024	0.3844	0.4057	0.3559	0.3660	0.3522	0.3472	0.3421	0.3103	0.2975	0.3074	0.3264	0.3337	0.3380	0.3431	0.3274	0.2955	0.2844	0.2848	0.2604
	NO2	g/vehicle/km	0.0417	0.0391	0.0385	0.0394	0.0406	0.0499	0.0506	0.0548	0.0665	0.0640	0.0624	0.0607	0.0615	0.0582	0.0609	0.0643	0.0660	0.0672	0.0689	0.0664	0.0587	0.0544	0.0542	0.0501
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0119***	***0.0079***	***0.0054***	***0.0042***	***0.0037***	***0.0087***	***0.0195***	***0.0416***	***0.0634***	***0.0592***	***0.0535***	***0.0505***	***0.0441***	***0.0395***	***0.0433***	***0.0484***	***0.0518***	***0.0564***	***0.0606***	***0.0555***	***0.0411***	***0.0324***	***0.0303***	***0.0245***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.95E-03	5.25E-03	3.62E-03	2.79E-03	2.44E-03	5.79E-03	1.30E-02	2.77E-02	4.23E-02	3.95E-02	3.57E-02	3.37E-02	2.94E-02	2.63E-02	2.89E-02	3.22E-02	3.45E-02	3.76E-02	4.04E-02	3.70E-02	2.74E-02	2.16E-02	2.02E-02	1.63E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.98E-03	2.63E-03	1.81E-03	1.40E-03	1.22E-03	2.89E-03	6.51E-03	1.39E-02	2.11E-02	1.97E-02	1.78E-02	1.68E-02	1.47E-02	1.32E-02	1.44E-02	1.61E-02	1.73E-02	1.88E-02	2.02E-02	1.85E-02	1.37E-02	1.08E-02	1.01E-02	8.16E-03
	Emission in each Box of 1st jet	g/s	1.14E-03	7.50E-04	5.18E-04	3.99E-04	3.49E-04	8.26E-04	1.86E-03	3.96E-03	6.04E-03	5.64E-03	5.10E-03	4.81E-03	4.20E-03	3.76E-03	4.13E-03	4.61E-03	4.93E-03	5.37E-03	5.77E-03	5.28E-03	3.91E-03	3.09E-03	2.89E-03	2.33E-03
	Emission in each Box of 2nd jet	g/s	1.99E-03	1.31E-03	9.06E-04	6.98E-04	6.10E-04	1.45E-03	3.26E-03	6.93E-03	1.06E-02	9.87E-03	8.92E-03	8.42E-03	7.35E-03	6.58E-03	7.22E-03	8.06E-03	8.63E-03	9.41E-03	1.01E-02	9.24E-03	6.84E-03	5.40E-03	5.06E-03	4.08E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0024***	***0.0064***	***0.0115***	***0.0108***	***0.0096***	***0.0090***	***0.0087***	***0.0077***	***0.0086***	***0.0095***	***0.0102***	***0.0112***	***0.0122***	***0.0112***	***0.0082***	***0.0062***	***0.0058***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.45E-03	1.10E-03	7.47E-04	5.64E-04	4.90E-04	7.51E-04	1.62E-03	4.27E-03	7.68E-03	7.17E-03	6.41E-03	5.97E-03	5.82E-03	5.15E-03	5.72E-03	6.35E-03	6.82E-03	7.48E-03	8.11E-03	7.49E-03	5.44E-03	4.14E-03	3.85E-03	3.14E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.23E-04	5.52E-04	3.73E-04	2.82E-04	2.45E-04	3.75E-04	8.12E-04	2.14E-03	3.84E-03	3.59E-03	3.21E-03	2.99E-03	2.91E-03	2.58E-03	2.86E-03	3.18E-03	3.41E-03	3.74E-03	4.05E-03	3.75E-03	2.72E-03	2.07E-03	1.92E-03	1.57E-03
	Emission in each Box of 1st jet	g/s	2.07E-04	1.58E-04	1.07E-04	8.06E-05	6.99E-05	1.07E-04	2.32E-04	6.11E-04	1.10E-03	1.02E-03	9.16E-04	8.53E-04	8.32E-04	7.36E-04	8.17E-04	9.07E-04	9.74E-04	1.07E-03	1.16E-03	1.07E-03	7.77E-04	5.91E-04	5.49E-04	4.48E-04
	Emission in each Box of 2nd jet	g/s	3.62E-04	2.76E-04	1.87E-04	1.41E-04	1.22E-04	1.88E-04	4.06E-04	1.07E-03	1.92E-03	1.79E-03	1.60E-03	1.49E-03	1.46E-03	1.29E-03	1.43E-03	1.59E-03	1.70E-03	1.87E-03	2.03E-03	1.87E-03	1.36E-03	1.03E-03	9.62E-04	7.84E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2090	0.1762	0.1821	0.1880	0.1947	0.3673	0.3875	0.3505	0.3647	0.3469	0.3410	0.3302	0.2995	0.2982	0.3043	0.3258	0.3314	0.3424	0.3558	0.3325	0.2992	0.2851	0.2823	0.2638
	NO2	g/vehicle/km	0.0382	0.0372	0.0376	0.0381	0.0392	0.0478	0.0484	0.0541	0.0662	0.0631	0.0613	0.0586	0.0594	0.0583	0.0603	0.0641	0.0655	0.0681	0.0713	0.0673	0.0594	0.0546	0.0537	0.0508
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0109***	***0.0075***	***0.0053***	***0.0040***	***0.0035***	***0.0083***	***0.0187***	***0.0410***	***0.0632***	***0.0583***	***0.0526***	***0.0487***	***0.0426***	***0.0396***	***0.0429***	***0.0483***	***0.0514***	***0.0572***	***0.0628***	***0.0563***	***0.0416***	***0.0325***	***0.0301***	***0.0248***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.26E-03	4.98E-03	3.53E-03	2.69E-03	2.35E-03	5.53E-03	1.24E-02	2.73E-02	4.21E-02	3.89E-02	3.50E-02	3.25E-02	2.84E-02	2.64E-02	2.86E-02	3.22E-02	3.43E-02	3.81E-02	4.19E-02	3.75E-02	2.77E-02	2.17E-02	2.00E-02	1.65E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.63E-03	2.49E-03	1.76E-03	1.35E-03	1.17E-03	2.76E-03	6.22E-03	1.37E-02	2.11E-02	1.94E-02	1.75E-02	1.62E-02	1.42E-02	1.32E-02	1.43E-02	1.61E-02	1.71E-02	1.91E-02	2.09E-02	1.88E-02	1.39E-02	1.08E-02	1.00E-02	8.26E-03
	Emission in each Box of 1st jet	g/s	1.04E-03	7.11E-04	5.04E-04	3.85E-04	3.36E-04	7.90E-04	1.78E-03	3.90E-03	6.02E-03	5.55E-03	5.01E-03	4.64E-03	4.05E-03	3.77E-03	4.09E-03	4.60E-03	4.89E-03	5.44E-03	5.98E-03	5.36E-03	3.96E-03	3.10E-03	2.86E-03	2.36E-03
	Emission in each Box of 2nd jet	g/s	1.81E-03	1.24E-03	8.82E-04	6.74E-04	5.87E-04	1.38E-03	3.11E-03	6.83E-03	1.05E-02	9.72E-03	8.76E-03	8.12E-03	7.09E-03	6.60E-03	7.15E-03	8.05E-03	8.56E-03	9.53E-03	1.05E-02	9.39E-03	6.93E-03	5.42E-03	5.01E-03	4.13E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0023***	***0.0063***	***0.0115***	***0.0106***	***0.0095***	***0.0087***	***0.0084***	***0.0077***	***0.0085***	***0.0095***	***0.0102***	***0.0114***	***0.0126***	***0.0114***	***0.0083***	***0.0062***	***0.0057***	***0.0048***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.33E-03	1.05E-03	7.29E-04	5.47E-04	4.73E-04	7.19E-04	1.55E-03	4.21E-03	7.65E-03	7.07E-03	6.30E-03	5.77E-03	5.63E-03	5.16E-03	5.67E-03	6.33E-03	6.77E-03	7.58E-03	8.40E-03	7.60E-03	5.51E-03	4.15E-03	3.81E-03	3.18E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.64E-04	5.26E-04	3.64E-04	2.73E-04	2.36E-04	3.59E-04	7.77E-04	2.11E-03	3.83E-03	3.54E-03	3.15E-03	2.89E-03	2.81E-03	2.58E-03	2.83E-03	3.17E-03	3.39E-03	3.79E-03	4.20E-03	3.80E-03	2.75E-03	2.07E-03	1.91E-03	1.59E-03
	Emission in each Box of 1st jet	g/s	1.90E-04	1.50E-04	1.04E-04	7.81E-05	6.75E-05	1.03E-04	2.22E-04	6.02E-04	1.09E-03	1.01E-03	9.00E-04	8.24E-04	8.04E-04	7.37E-04	8.09E-04	9.05E-04	9.67E-04	1.08E-03	1.20E-03	1.09E-03	7.86E-04	5.93E-04	5.45E-04	4.54E-04
	Emission in each Box of 2nd jet	g/s	3.32E-04	2.63E-04	1.82E-04	1.37E-04	1.18E-04	1.80E-04	3.88E-04	1.05E-03	1.91E-03	1.77E-03	1.58E-03	1.44E-03	1.41E-03	1.29E-03	1.42E-03	1.58E-03	1.69E-03	1.89E-03	2.10E-03	1.90E-03	1.38E-03	1.04E-03	9.54E-04	7.95E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2043	0.1701	0.1746	0.1800	0.1837	0.3580	0.3722	0.3347	0.3459	0.3471	0.3465	0.3461	0.3103	0.3030	0.3103	0.3348	0.3285	0.3380	0.3444	0.3196	0.2801	0.2671	0.2651	0.2406
	NO2	g/vehicle/km	0.0374	0.0360	0.0361	0.0366	0.0371	0.0466	0.0466	0.0517	0.0629	0.0631	0.0623	0.0613	0.0615	0.0592	0.0615	0.0659	0.0650	0.0672	0.0691	0.0648	0.0558	0.0513	0.0506	0.0465
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0106***	***0.0072***	***0.0051***	***0.0039***	***0.0033***	***0.0081***	***0.0179***	***0.0391***	***0.0600***	***0.0583***	***0.0534***	***0.0511***	***0.0441***	***0.0402***	***0.0437***	***0.0496***	***0.0509***	***0.0564***	***0.0608***	***0.0541***	***0.0389***	***0.0305***	***0.0282***	***0.0226***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.09E-03	4.81E-03	3.38E-03	2.58E-03	2.22E-03	5.39E-03	1.20E-02	2.61E-02	4.00E-02	3.89E-02	3.56E-02	3.41E-02	2.94E-02	2.68E-02	2.92E-02	3.31E-02	3.40E-02	3.76E-02	4.05E-02	3.61E-02	2.60E-02	2.03E-02	1.88E-02	1.51E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.55E-03	2.40E-03	1.69E-03	1.29E-03	1.11E-03	2.69E-03	5.98E-03	1.30E-02	2.00E-02	1.94E-02	1.78E-02	1.70E-02	1.47E-02	1.34E-02	1.46E-02	1.65E-02	1.70E-02	1.88E-02	2.03E-02	1.80E-02	1.30E-02	1.02E-02	9.41E-03	7.53E-03
	Emission in each Box of 1st jet	g/s	1.01E-03	6.87E-04	4.83E-04	3.69E-04	3.17E-04	7.70E-04	1.71E-03	3.73E-03	5.71E-03	5.56E-03	5.09E-03	4.87E-03	4.20E-03	3.83E-03	4.17E-03	4.72E-03	4.85E-03	5.38E-03	5.79E-03	5.16E-03	3.71E-03	2.90E-03	2.69E-03	2.15E-03
	Emission in each Box of 2nd jet	g/s	1.77E-03	1.20E-03	8.46E-04	6.45E-04	5.54E-04	1.35E-03	2.99E-03	6.52E-03	9.99E-03	9.72E-03	8.90E-03	8.52E-03	7.35E-03	6.71E-03	7.29E-03	8.27E-03	8.49E-03	9.41E-03	1.01E-02	9.02E-03	6.49E-03	5.08E-03	4.70E-03	3.77E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0022***	***0.0060***	***0.0109***	***0.0106***	***0.0096***	***0.0091***	***0.0087***	***0.0079***	***0.0087***	***0.0098***	***0.0101***	***0.0112***	***0.0122***	***0.0110***	***0.0078***	***0.0058***	***0.0054***	***0.0044***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.30E-03	1.02E-03	7.01E-04	5.25E-04	4.48E-04	7.02E-04	1.50E-03	4.03E-03	7.27E-03	7.08E-03	6.40E-03	6.04E-03	5.82E-03	5.24E-03	5.78E-03	6.51E-03	6.72E-03	7.48E-03	8.13E-03	7.32E-03	5.17E-03	3.90E-03	3.59E-03	2.91E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.50E-04	5.09E-04	3.50E-04	2.62E-04	2.24E-04	3.51E-04	7.48E-04	2.01E-03	3.64E-03	3.54E-03	3.20E-03	3.02E-03	2.91E-03	2.62E-03	2.89E-03	3.25E-03	3.36E-03	3.74E-03	4.07E-03	3.66E-03	2.58E-03	1.95E-03	1.80E-03	1.46E-03
	Emission in each Box of 1st jet	g/s	1.86E-04	1.45E-04	1.00E-04	7.50E-05	6.40E-05	1.00E-04	2.14E-04	5.76E-04	1.04E-03	1.01E-03	9.14E-04	8.62E-04	8.32E-04	7.48E-04	8.25E-04	9.29E-04	9.59E-04	1.07E-03	1.16E-03	1.05E-03	7.38E-04	5.57E-04	5.13E-04	4.16E-04
	Emission in each Box of 2nd jet	g/s	3.25E-04	2.54E-04	1.75E-04	1.31E-04	1.12E-04	1.75E-04	3.74E-04	1.01E-03	1.82E-03	1.77E-03	1.60E-03	1.51E-03	1.46E-03	1.31E-03	1.44E-03	1.63E-03	1.68E-03	1.87E-03	2.03E-03	1.83E-03	1.29E-03	9.74E-04	8.98E-04	7.28E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2159	0.1748	0.1806	0.1895	0.1947	0.3658	0.3858	0.3332	0.3492	0.3403	0.3388	0.3316	0.3019	0.3025	0.3106	0.3304	0.3502	0.3536	0.3635	0.3378	0.2933	0.2712	0.2748	0.2529
	NO2	g/vehicle/km	0.0395	0.0369	0.0373	0.0384	0.0392	0.0476	0.0482	0.0515	0.0635	0.0619	0.0609	0.0588	0.0598	0.0591	0.0616	0.0650	0.0691	0.0702	0.0728	0.0684	0.0583	0.0520	0.0523	0.0487
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0112***	***0.0074***	***0.0052***	***0.0041***	***0.0035***	***0.0083***	***0.0186***	***0.0390***	***0.0605***	***0.0572***	***0.0522***	***0.0489***	***0.0429***	***0.0402***	***0.0438***	***0.0490***	***0.0543***	***0.0590***	***0.0641***	***0.0572***	***0.0408***	***0.0309***	***0.0293***	***0.0238***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.50E-03	4.94E-03	3.50E-03	2.72E-03	2.35E-03	5.50E-03	1.24E-02	2.60E-02	4.04E-02	3.81E-02	3.48E-02	3.26E-02	2.86E-02	2.68E-02	2.92E-02	3.26E-02	3.62E-02	3.94E-02	4.28E-02	3.81E-02	2.72E-02	2.06E-02	1.95E-02	1.58E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.75E-03	2.47E-03	1.75E-03	1.36E-03	1.17E-03	2.75E-03	6.20E-03	1.30E-02	2.02E-02	1.91E-02	1.74E-02	1.63E-02	1.43E-02	1.34E-02	1.46E-02	1.63E-02	1.81E-02	1.97E-02	2.14E-02	1.91E-02	1.36E-02	1.03E-02	9.76E-03	7.92E-03
	Emission in each Box of 1st jet	g/s	1.07E-03	7.05E-04	5.00E-04	3.88E-04	3.36E-04	7.86E-04	1.77E-03	3.71E-03	5.76E-03	5.45E-03	4.97E-03	4.66E-03	4.09E-03	3.83E-03	4.17E-03	4.66E-03	5.17E-03	5.62E-03	6.11E-03	5.45E-03	3.88E-03	2.94E-03	2.79E-03	2.26E-03
	Emission in each Box of 2nd jet	g/s	1.87E-03	1.23E-03	8.75E-04	6.79E-04	5.87E-04	1.38E-03	3.10E-03	6.49E-03	1.01E-02	9.53E-03	8.70E-03	8.16E-03	7.15E-03	6.70E-03	7.30E-03	8.16E-03	9.05E-03	9.84E-03	1.07E-02	9.54E-03	6.79E-03	5.15E-03	4.88E-03	3.96E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0023***	***0.0060***	***0.0110***	***0.0104***	***0.0094***	***0.0087***	***0.0085***	***0.0078***	***0.0087***	***0.0096***	***0.0107***	***0.0117***	***0.0129***	***0.0116***	***0.0081***	***0.0059***	***0.0056***	***0.0046***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.37E-03	1.04E-03	7.24E-04	5.51E-04	4.73E-04	7.16E-04	1.55E-03	4.01E-03	7.34E-03	6.94E-03	6.26E-03	5.79E-03	5.67E-03	5.23E-03	5.79E-03	6.43E-03	7.14E-03	7.82E-03	8.57E-03	7.72E-03	5.40E-03	3.95E-03	3.72E-03	3.05E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.85E-04	5.21E-04	3.62E-04	2.75E-04	2.36E-04	3.58E-04	7.74E-04	2.01E-03	3.67E-03	3.47E-03	3.13E-03	2.90E-03	2.83E-03	2.62E-03	2.89E-03	3.21E-03	3.57E-03	3.91E-03	4.28E-03	3.86E-03	2.70E-03	1.98E-03	1.86E-03	1.53E-03
	Emission in each Box of 1st jet	g/s	1.96E-04	1.49E-04	1.03E-04	7.87E-05	6.75E-05	1.02E-04	2.21E-04	5.73E-04	1.05E-03	9.91E-04	8.95E-04	8.27E-04	8.10E-04	7.48E-04	8.27E-04	9.18E-04	1.02E-03	1.12E-03	1.22E-03	1.10E-03	7.72E-04	5.65E-04	5.31E-04	4.36E-04
	Emission in each Box of 2nd jet	g/s	3.43E-04	2.61E-04	1.81E-04	1.38E-04	1.18E-04	1.79E-04	3.87E-04	1.00E-03	1.83E-03	1.73E-03	1.57E-03	1.45E-03	1.42E-03	1.31E-03	1.45E-03	1.61E-03	1.79E-03	1.95E-03	2.14E-03	1.93E-03	1.35E-03	9.88E-04	9.29E-04	7.63E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2144	0.1786	0.1781	0.1818	0.1937	0.3563	0.3775	0.3277	0.3344	0.3253	0.3360	0.3167	0.2969	0.2941	0.3085	0.3135	0.3157	0.3351	0.3474	0.3228	0.2930	0.2736	0.2741	0.2501
	NO2	g/vehicle/km	0.0392	0.0377	0.0368	0.0369	0.0390	0.0464	0.0472	0.0507	0.0609	0.0593	0.0604	0.0563	0.0588	0.0575	0.0611	0.0618	0.0625	0.0666	0.0697	0.0655	0.0583	0.0525	0.0522	0.0482
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0112***	***0.0076***	***0.0052***	***0.0039***	***0.0035***	***0.0080***	***0.0182***	***0.0383***	***0.0580***	***0.0547***	***0.0518***	***0.0468***	***0.0422***	***0.0391***	***0.0435***	***0.0465***	***0.0489***	***0.0560***	***0.0613***	***0.0547***	***0.0407***	***0.0312***	***0.0292***	***0.0235***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.44E-03	5.04E-03	3.45E-03	2.61E-03	2.34E-03	5.36E-03	1.21E-02	2.55E-02	3.86E-02	3.65E-02	3.45E-02	3.12E-02	2.81E-02	2.60E-02	2.90E-02	3.10E-02	3.26E-02	3.73E-02	4.09E-02	3.65E-02	2.72E-02	2.08E-02	1.95E-02	1.57E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.72E-03	2.52E-03	1.73E-03	1.30E-03	1.17E-03	2.68E-03	6.06E-03	1.28E-02	1.93E-02	1.82E-02	1.73E-02	1.56E-02	1.41E-02	1.30E-02	1.45E-02	1.55E-02	1.63E-02	1.87E-02	2.04E-02	1.82E-02	1.36E-02	1.04E-02	9.73E-03	7.83E-03
	Emission in each Box of 1st jet	g/s	1.06E-03	7.21E-04	4.93E-04	3.72E-04	3.34E-04	7.66E-04	1.73E-03	3.65E-03	5.52E-03	5.21E-03	4.93E-03	4.45E-03	4.02E-03	3.72E-03	4.14E-03	4.42E-03	4.66E-03	5.33E-03	5.84E-03	5.21E-03	3.88E-03	2.97E-03	2.78E-03	2.24E-03
	Emission in each Box of 2nd jet	g/s	1.86E-03	1.26E-03	8.63E-04	6.51E-04	5.84E-04	1.34E-03	3.03E-03	6.38E-03	9.66E-03	9.11E-03	8.63E-03	7.79E-03	7.03E-03	6.51E-03	7.25E-03	7.74E-03	8.16E-03	9.33E-03	1.02E-02	9.11E-03	6.79E-03	5.20E-03	4.86E-03	3.92E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0023***	***0.0059***	***0.0106***	***0.0100***	***0.0093***	***0.0083***	***0.0084***	***0.0076***	***0.0086***	***0.0092***	***0.0097***	***0.0111***	***0.0123***	***0.0111***	***0.0081***	***0.0060***	***0.0056***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.36E-03	1.06E-03	7.14E-04	5.29E-04	4.70E-04	6.98E-04	1.52E-03	3.95E-03	7.04E-03	6.65E-03	6.21E-03	5.54E-03	5.58E-03	5.09E-03	5.74E-03	6.10E-03	6.47E-03	7.42E-03	8.20E-03	7.39E-03	5.40E-03	3.99E-03	3.71E-03	3.02E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.81E-04	5.32E-04	3.57E-04	2.65E-04	2.35E-04	3.49E-04	7.58E-04	1.97E-03	3.52E-03	3.32E-03	3.10E-03	2.77E-03	2.79E-03	2.55E-03	2.87E-03	3.05E-03	3.23E-03	3.71E-03	4.10E-03	3.70E-03	2.70E-03	1.99E-03	1.85E-03	1.51E-03
	Emission in each Box of 1st jet	g/s	1.94E-04	1.52E-04	1.02E-04	7.56E-05	6.72E-05	9.98E-05	2.16E-04	5.64E-04	1.01E-03	9.49E-04	8.87E-04	7.92E-04	7.97E-04	7.27E-04	8.21E-04	8.72E-04	9.24E-04	1.06E-03	1.17E-03	1.06E-03	7.71E-04	5.70E-04	5.29E-04	4.32E-04
	Emission in each Box of 2nd jet	g/s	3.40E-04	2.66E-04	1.79E-04	1.32E-04	1.18E-04	1.75E-04	3.79E-04	9.87E-04	1.76E-03	1.66E-03	1.55E-03	1.39E-03	1.39E-03	1.27E-03	1.44E-03	1.53E-03	1.62E-03	1.85E-03	2.05E-03	1.85E-03	1.35E-03	9.97E-04	9.26E-04	7.55E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2439	0.2057	0.2066	0.2143	0.2236	0.4287	0.4498	0.3907	0.3973	0.3823	0.3751	0.3703	0.3384	0.3280	0.3321	0.3599	0.3633	0.3754	0.3888	0.3642	0.3287	0.3072	0.3104	0.2884
	NO2	g/vehicle/km	0.0441	0.0428	0.0421	0.0429	0.0443	0.0552	0.0557	0.0598	0.0717	0.0691	0.0671	0.0653	0.0667	0.0638	0.0655	0.0705	0.0715	0.0743	0.0775	0.0734	0.0649	0.0585	0.0587	0.0551
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0127***	***0.0087***	***0.0060***	***0.0046***	***0.0040***	***0.0097***	***0.0217***	***0.0457***	***0.0689***	***0.0643***	***0.0578***	***0.0547***	***0.0481***	***0.0436***	***0.0468***	***0.0533***	***0.0563***	***0.0627***	***0.0686***	***0.0617***	***0.0457***	***0.0350***	***0.0331***	***0.0271***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.47E-03	5.81E-03	4.00E-03	3.07E-03	2.70E-03	6.45E-03	1.44E-02	3.04E-02	4.59E-02	4.28E-02	3.85E-02	3.64E-02	3.21E-02	2.90E-02	3.12E-02	3.56E-02	3.76E-02	4.18E-02	4.57E-02	4.11E-02	3.05E-02	2.33E-02	2.20E-02	1.81E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.23E-03	2.91E-03	2.00E-03	1.54E-03	1.35E-03	3.23E-03	7.22E-03	1.52E-02	2.30E-02	2.14E-02	1.93E-02	1.82E-02	1.60E-02	1.45E-02	1.56E-02	1.78E-02	1.88E-02	2.09E-02	2.29E-02	2.06E-02	1.52E-02	1.17E-02	1.10E-02	9.03E-03
	Emission in each Box of 1st jet	g/s	1.21E-03	8.30E-04	5.72E-04	4.39E-04	3.85E-04	9.22E-04	2.06E-03	4.35E-03	6.56E-03	6.12E-03	5.51E-03	5.21E-03	4.58E-03	4.15E-03	4.46E-03	5.08E-03	5.37E-03	5.97E-03	6.54E-03	5.87E-03	4.35E-03	3.34E-03	3.15E-03	2.58E-03
	Emission in each Box of 2nd jet	g/s	2.12E-03	1.45E-03	1.00E-03	7.68E-04	6.74E-04	1.61E-03	3.61E-03	7.61E-03	1.15E-02	1.07E-02	9.63E-03	9.11E-03	8.02E-03	7.26E-03	7.80E-03	8.89E-03	9.39E-03	1.04E-02	1.14E-02	1.03E-02	7.61E-03	5.84E-03	5.51E-03	4.52E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0027***	***0.0070***	***0.0124***	***0.0116***	***0.0103***	***0.0096***	***0.0095***	***0.0085***	***0.0092***	***0.0104***	***0.0111***	***0.0124***	***0.0137***	***0.0124***	***0.0090***	***0.0067***	***0.0062***	***0.0052***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.53E-03	1.21E-03	8.16E-04	6.15E-04	5.34E-04	8.31E-04	1.79E-03	4.66E-03	8.28E-03	7.74E-03	6.89E-03	6.43E-03	6.32E-03	5.65E-03	6.16E-03	6.96E-03	7.39E-03	8.27E-03	9.12E-03	8.29E-03	6.01E-03	4.45E-03	4.17E-03	3.45E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.66E-04	6.04E-04	4.08E-04	3.07E-04	2.67E-04	4.15E-04	8.94E-04	2.33E-03	4.14E-03	3.87E-03	3.44E-03	3.22E-03	3.16E-03	2.82E-03	3.08E-03	3.48E-03	3.70E-03	4.13E-03	4.56E-03	4.14E-03	3.01E-03	2.22E-03	2.08E-03	1.73E-03
	Emission in each Box of 1st jet	g/s	2.19E-04	1.73E-04	1.17E-04	8.78E-05	7.63E-05	1.19E-04	2.55E-04	6.66E-04	1.18E-03	1.11E-03	9.84E-04	9.19E-04	9.02E-04	8.07E-04	8.79E-04	9.95E-04	1.06E-03	1.18E-03	1.30E-03	1.18E-03	8.59E-04	6.35E-04	5.95E-04	4.93E-04
	Emission in each Box of 2nd jet	g/s	3.83E-04	3.02E-04	2.04E-04	1.54E-04	1.34E-04	2.08E-04	4.47E-04	1.16E-03	2.07E-03	1.94E-03	1.72E-03	1.61E-03	1.58E-03	1.41E-03	1.54E-03	1.74E-03	1.85E-03	2.07E-03	2.28E-03	2.07E-03	1.50E-03	1.11E-03	1.04E-03	8.63E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2664	0.2207	0.2248	0.2346	0.2441	0.4637	0.4913	0.4222	0.4292	0.4116	0.4051	0.3942	0.3622	0.3543	0.3604	0.3842	0.3891	0.3996	0.4137	0.3943	0.3518	0.3349	0.3365	0.3110
	NO2	g/vehicle/km	0.0479	0.0457	0.0454	0.0465	0.0479	0.0594	0.0605	0.0644	0.0770	0.0740	0.0720	0.0692	0.0709	0.0684	0.0706	0.0748	0.0761	0.0786	0.0822	0.0790	0.0691	0.0633	0.0632	0.0590
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0139***	***0.0094***	***0.0065***	***0.0050***	***0.0044***	***0.0105***	***0.0237***	***0.0494***	***0.0744***	***0.0692***	***0.0624***	***0.0582***	***0.0515***	***0.0470***	***0.0508***	***0.0569***	***0.0603***	***0.0667***	***0.0730***	***0.0668***	***0.0489***	***0.0382***	***0.0358***	***0.0292***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.25E-03	6.24E-03	4.36E-03	3.36E-03	2.95E-03	6.98E-03	1.58E-02	3.29E-02	4.96E-02	4.61E-02	4.16E-02	3.88E-02	3.43E-02	3.14E-02	3.39E-02	3.80E-02	4.02E-02	4.45E-02	4.87E-02	4.45E-02	3.26E-02	2.55E-02	2.39E-02	1.95E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.63E-03	3.12E-03	2.18E-03	1.68E-03	1.47E-03	3.49E-03	7.89E-03	1.65E-02	2.48E-02	2.31E-02	2.08E-02	1.94E-02	1.72E-02	1.57E-02	1.69E-02	1.90E-02	2.01E-02	2.22E-02	2.43E-02	2.23E-02	1.63E-02	1.27E-02	1.19E-02	9.74E-03
	Emission in each Box of 1st jet	g/s	1.32E-03	8.91E-04	6.22E-04	4.80E-04	4.21E-04	9.97E-04	2.25E-03	4.70E-03	7.09E-03	6.59E-03	5.95E-03	5.54E-03	4.90E-03	4.48E-03	4.84E-03	5.42E-03	5.75E-03	6.35E-03	6.95E-03	6.36E-03	4.66E-03	3.64E-03	3.41E-03	2.78E-03
	Emission in each Box of 2nd jet	g/s	2.31E-03	1.56E-03	1.09E-03	8.41E-04	7.36E-04	1.74E-03	3.94E-03	8.23E-03	1.24E-02	1.15E-02	1.04E-02	9.70E-03	8.58E-03	7.84E-03	8.47E-03	9.49E-03	1.01E-02	1.11E-02	1.22E-02	1.11E-02	8.15E-03	6.36E-03	5.97E-03	4.87E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0019***	***0.0013***	***0.0010***	***0.0009***	***0.0013***	***0.0029***	***0.0075***	***0.0133***	***0.0124***	***0.0111***	***0.0102***	***0.0101***	***0.0091***	***0.0100***	***0.0111***	***0.0118***	***0.0131***	***0.0145***	***0.0134***	***0.0096***	***0.0072***	***0.0067***	***0.0055***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.66E-03	1.29E-03	8.79E-04	6.66E-04	5.78E-04	8.95E-04	1.94E-03	5.02E-03	8.90E-03	8.29E-03	7.39E-03	6.81E-03	6.71E-03	6.06E-03	6.64E-03	7.39E-03	7.87E-03	8.75E-03	9.67E-03	8.92E-03	6.40E-03	4.81E-03	4.49E-03	3.70E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.31E-04	6.45E-04	4.40E-04	3.33E-04	2.89E-04	4.47E-04	9.72E-04	2.51E-03	4.45E-03	4.15E-03	3.70E-03	3.40E-03	3.36E-03	3.03E-03	3.32E-03	3.70E-03	3.94E-03	4.38E-03	4.84E-03	4.46E-03	3.20E-03	2.41E-03	2.25E-03	1.85E-03
	Emission in each Box of 1st jet	g/s	2.37E-04	1.84E-04	1.26E-04	9.51E-05	8.26E-05	1.28E-04	2.78E-04	7.17E-04	1.27E-03	1.18E-03	1.06E-03	9.73E-04	9.59E-04	8.65E-04	9.48E-04	1.06E-03	1.12E-03	1.25E-03	1.38E-03	1.27E-03	9.15E-04	6.87E-04	6.41E-04	5.28E-04
	Emission in each Box of 2nd jet	g/s	4.16E-04	3.22E-04	2.20E-04	1.67E-04	1.45E-04	2.24E-04	4.86E-04	1.25E-03	2.22E-03	2.07E-03	1.85E-03	1.70E-03	1.68E-03	1.51E-03	1.66E-03	1.85E-03	1.97E-03	2.19E-03	2.42E-03	2.23E-03	1.60E-03	1.20E-03	1.12E-03	9.25E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2766	0.2306	0.2350	0.2455	0.2542	0.4778	0.5060	0.4372	0.4417	0.4232	0.4163	0.4081	0.3728	0.3630	0.3696	0.3948	0.4023	0.4171	0.4268	0.4063	0.3635	0.3457	0.3479	0.3229
	NO2	g/vehicle/km	0.0493	0.0472	0.0469	0.0481	0.0494	0.0609	0.0620	0.0662	0.0788	0.0756	0.0735	0.0712	0.0726	0.0698	0.0721	0.0765	0.0784	0.0816	0.0844	0.0810	0.0710	0.0650	0.0650	0.0610
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0144***	***0.0098***	***0.0068***	***0.0053***	***0.0046***	***0.0108***	***0.0244***	***0.0511***	***0.0766***	***0.0711***	***0.0642***	***0.0602***	***0.0530***	***0.0482***	***0.0521***	***0.0585***	***0.0624***	***0.0696***	***0.0753***	***0.0688***	***0.0505***	***0.0394***	***0.0371***	***0.0303***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.61E-03	6.52E-03	4.55E-03	3.52E-03	3.07E-03	7.19E-03	1.63E-02	3.41E-02	5.10E-02	4.74E-02	4.28E-02	4.02E-02	3.53E-02	3.21E-02	3.47E-02	3.90E-02	4.16E-02	4.64E-02	5.02E-02	4.59E-02	3.37E-02	2.63E-02	2.47E-02	2.02E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.80E-03	3.26E-03	2.28E-03	1.76E-03	1.53E-03	3.60E-03	8.13E-03	1.70E-02	2.55E-02	2.37E-02	2.14E-02	2.01E-02	1.77E-02	1.61E-02	1.74E-02	1.95E-02	2.08E-02	2.32E-02	2.51E-02	2.29E-02	1.68E-02	1.31E-02	1.24E-02	1.01E-02
	Emission in each Box of 1st jet	g/s	1.37E-03	9.31E-04	6.51E-04	5.03E-04	4.38E-04	1.03E-03	2.32E-03	4.87E-03	7.29E-03	6.78E-03	6.11E-03	5.74E-03	5.05E-03	4.59E-03	4.96E-03	5.57E-03	5.94E-03	6.63E-03	7.17E-03	6.55E-03	4.81E-03	3.75E-03	3.53E-03	2.89E-03
	Emission in each Box of 2nd jet	g/s	2.40E-03	1.63E-03	1.14E-03	8.80E-04	7.67E-04	1.80E-03	4.06E-03	8.52E-03	1.28E-02	1.19E-02	1.07E-02	1.00E-02	8.83E-03	8.04E-03	8.68E-03	9.75E-03	1.04E-02	1.16E-02	1.26E-02	1.15E-02	8.42E-03	6.57E-03	6.18E-03	5.06E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0010***	***0.0009***	***0.0014***	***0.0030***	***0.0077***	***0.0137***	***0.0127***	***0.0113***	***0.0105***	***0.0103***	***0.0093***	***0.0102***	***0.0113***	***0.0121***	***0.0136***	***0.0149***	***0.0137***	***0.0099***	***0.0074***	***0.0069***	***0.0057***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.71E-03	1.33E-03	9.08E-04	6.89E-04	5.96E-04	9.16E-04	1.99E-03	5.16E-03	9.11E-03	8.47E-03	7.56E-03	7.00E-03	6.88E-03	6.18E-03	6.78E-03	7.56E-03	8.10E-03	9.09E-03	9.93E-03	9.15E-03	6.57E-03	4.94E-03	4.61E-03	3.82E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.57E-04	6.66E-04	4.54E-04	3.44E-04	2.98E-04	4.58E-04	9.95E-04	2.58E-03	4.55E-03	4.24E-03	3.78E-03	3.50E-03	3.44E-03	3.09E-03	3.39E-03	3.78E-03	4.05E-03	4.54E-03	4.96E-03	4.57E-03	3.29E-03	2.47E-03	2.31E-03	1.91E-03
	Emission in each Box of 1st jet	g/s	2.45E-04	1.90E-04	1.30E-04	9.84E-05	8.52E-05	1.31E-04	2.84E-04	7.37E-04	1.30E-03	1.21E-03	1.08E-03	1.00E-03	9.82E-04	8.82E-04	9.68E-04	1.08E-03	1.16E-03	1.30E-03	1.42E-03	1.31E-03	9.39E-04	7.06E-04	6.59E-04	5.45E-04
	Emission in each Box of 2nd jet	g/s	4.28E-04	3.33E-04	2.27E-04	1.72E-04	1.49E-04	2.29E-04	4.98E-04	1.29E-03	2.28E-03	2.12E-03	1.89E-03	1.75E-03	1.72E-03	1.54E-03	1.69E-03	1.89E-03	2.02E-03	2.27E-03	2.48E-03	2.29E-03	1.64E-03	1.24E-03	1.15E-03	9.55E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																								
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2796	0.2350	0.2384	0.2496	0.2579	0.4835	0.5109	0.4435	0.4467	0.4277	0.4187	0.4131	0.3762	0.3679	0.3748	0.4004	0.4122	0.4257	0.4360	0.4136	0.3711	0.3530	0.3518	0.3243
	NO2	g/vehicle/km	0.0497	0.0478	0.0474	0.0486	0.0499	0.0615	0.0625	0.0670	0.0795	0.0763	0.0739	0.0719	0.0730	0.0705	0.0728	0.0773	0.0800	0.0831	0.0859	0.0822	0.0722	0.0661	0.0655	0.0611
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0065***	***0.0044***	***0.0031***	***0.0024***	***0.0021***	***0.0047***	***0.0105***	***0.0228***	***0.0343***	***0.0319***	***0.0286***	***0.0270***	***0.0329***	***0.0301***	***0.0325***	***0.0365***	***0.0393***	***0.0438***	***0.0474***	***0.0433***	***0.0318***	***0.0247***	***0.0231***	***0.0188***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.30E-03	2.96E-03	2.06E-03	1.61E-03	1.39E-03	3.13E-03	7.02E-03	1.52E-02	2.29E-02	2.12E-02	1.90E-02	1.80E-02	2.19E-02	2.01E-02	2.17E-02	2.44E-02	2.62E-02	2.92E-02	3.16E-02	2.88E-02	2.12E-02	1.65E-02	1.54E-02	1.25E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.15E-03	1.48E-03	1.03E-03	8.04E-04	6.93E-04	1.57E-03	3.51E-03	7.59E-03	1.14E-02	1.06E-02	9.52E-03	8.99E-03	1.10E-02	1.00E-02	1.08E-02	1.22E-02	1.31E-02	1.46E-02	1.58E-02	1.44E-02	1.06E-02	8.24E-03	7.69E-03	6.25E-03
	Emission in each Box of 1st jet	g/s	2.69E-04	1.85E-04	1.29E-04	1.00E-04	8.66E-05	1.96E-04	4.38E-04	9.49E-04	1.43E-03	1.33E-03	1.19E-03	1.12E-03	1.37E-03	1.26E-03	1.35E-03	1.52E-03	1.64E-03	1.82E-03	1.98E-03	1.80E-03	1.32E-03	1.03E-03	9.61E-04	7.81E-04
	Emission in each Box of 2nd jet	g/s	1.43E-04	9.85E-05	6.88E-05	5.36E-05	4.62E-05	1.04E-04	2.34E-04	5.06E-04	7.63E-04	7.08E-04	6.34E-04	6.00E-04	7.31E-04	6.69E-04	7.22E-04	8.12E-04	8.74E-04	9.73E-04	1.05E-03	9.61E-04	7.06E-04	5.49E-04	5.13E-04	4.17E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0034***	***0.0061***	***0.0057***	***0.0050***	***0.0047***	***0.0064***	***0.0058***	***0.0063***	***0.0071***	***0.0076***	***0.0085***	***0.0093***	***0.0086***	***0.0062***	***0.0046***	***0.0043***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.65E-04	6.01E-04	4.10E-04	3.13E-04	2.68E-04	3.99E-04	8.58E-04	2.29E-03	4.08E-03	3.79E-03	3.36E-03	3.13E-03	4.25E-03	3.85E-03	4.21E-03	4.71E-03	5.09E-03	5.70E-03	6.23E-03	5.73E-03	4.12E-03	3.08E-03	2.86E-03	2.36E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.83E-04	3.01E-04	2.05E-04	1.57E-04	1.34E-04	1.99E-04	4.29E-04	1.15E-03	2.04E-03	1.90E-03	1.68E-03	1.57E-03	2.13E-03	1.92E-03	2.10E-03	2.35E-03	2.55E-03	2.85E-03	3.11E-03	2.87E-03	2.06E-03	1.54E-03	1.43E-03	1.18E-03
	Emission in each Box of 1st jet	g/s	4.78E-05	3.76E-05	2.56E-05	1.96E-05	1.68E-05	2.49E-05	5.36E-05	1.43E-04	2.55E-04	2.37E-04	2.10E-04	1.96E-04	2.66E-04	2.40E-04	2.63E-04	2.94E-04	3.18E-04	3.56E-04	3.89E-04	3.58E-04	2.58E-04	1.93E-04	1.79E-04	1.47E-04
	Emission in each Box of 2nd jet	g/s	2.55E-05	2.00E-05	1.37E-05	1.04E-05	8.94E-06	1.33E-05	2.86E-05	7.65E-05	1.36E-04	1.26E-04	1.12E-04	1.04E-04	1.42E-04	1.28E-04	1.40E-04	1.57E-04	1.70E-04	1.90E-04	2.08E-04	1.91E-04	1.37E-04	1.03E-04	9.55E-05	7.85E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2558	0.2139	0.2161	0.2275	0.2417	0.4589	0.4873	0.4194	0.4232	0.4101	0.4028	0.3955	0.3590	0.3467	0.3556	0.3812	0.3922	0.4003	0.4005	0.3794	0.3386	0.3229	0.3220	0.2964
	NO2	g/vehicle/km	0.0460	0.0442	0.0437	0.0451	0.0475	0.0588	0.0600	0.0639	0.0760	0.0737	0.0715	0.0693	0.0702	0.0670	0.0697	0.0742	0.0766	0.0787	0.0796	0.0761	0.0665	0.0611	0.0606	0.0565
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0059***	***0.0040***	***0.0028***	***0.0022***	***0.0019***	***0.0045***	***0.0100***	***0.0215***	***0.0325***	***0.0306***	***0.0275***	***0.0258***	***0.0314***	***0.0284***	***0.0308***	***0.0348***	***0.0374***	***0.0412***	***0.0435***	***0.0397***	***0.0290***	***0.0226***	***0.0211***	***0.0171***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.94E-03	2.69E-03	1.87E-03	1.46E-03	1.30E-03	2.97E-03	6.69E-03	1.44E-02	2.17E-02	2.04E-02	1.83E-02	1.72E-02	2.09E-02	1.89E-02	2.05E-02	2.32E-02	2.50E-02	2.75E-02	2.90E-02	2.65E-02	1.93E-02	1.51E-02	1.41E-02	1.14E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.97E-03	1.35E-03	9.35E-04	7.32E-04	6.49E-04	1.49E-03	3.35E-03	7.18E-03	1.08E-02	1.02E-02	9.16E-03	8.61E-03	1.05E-02	9.46E-03	1.03E-02	1.16E-02	1.25E-02	1.37E-02	1.45E-02	1.32E-02	9.67E-03	7.53E-03	7.04E-03	5.71E-03
	Emission in each Box of 1st jet	g/s	2.46E-04	1.68E-04	1.17E-04	9.16E-05	8.12E-05	1.86E-04	4.18E-04	8.98E-04	1.36E-03	1.27E-03	1.14E-03	1.08E-03	1.31E-03	1.18E-03	1.28E-03	1.45E-03	1.56E-03	1.72E-03	1.81E-03	1.65E-03	1.21E-03	9.41E-04	8.80E-04	7.14E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	8.97E-05	6.24E-05	4.88E-05	4.33E-05	9.92E-05	2.23E-04	4.79E-04	7.23E-04	6.79E-04	6.10E-04	5.74E-04	6.97E-04	6.31E-04	6.85E-04	7.73E-04	8.32E-04	9.15E-04	9.68E-04	8.82E-04	6.45E-04	5.02E-04	4.69E-04	3.81E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0033***	***0.0058***	***0.0055***	***0.0049***	***0.0045***	***0.0061***	***0.0055***	***0.0060***	***0.0068***	***0.0073***	***0.0081***	***0.0087***	***0.0080***	***0.0057***	***0.0043***	***0.0040***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.09E-04	5.56E-04	3.78E-04	2.90E-04	2.55E-04	3.81E-04	8.24E-04	2.19E-03	3.90E-03	3.66E-03	3.25E-03	3.02E-03	4.09E-03	3.66E-03	4.02E-03	4.52E-03	4.88E-03	5.40E-03	5.77E-03	5.31E-03	3.80E-03	2.85E-03	2.65E-03	2.18E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.54E-04	2.78E-04	1.89E-04	1.45E-04	1.28E-04	1.91E-04	4.12E-04	1.09E-03	1.95E-03	1.83E-03	1.63E-03	1.51E-03	2.04E-03	1.83E-03	2.01E-03	2.26E-03	2.44E-03	2.70E-03	2.88E-03	2.65E-03	1.90E-03	1.43E-03	1.32E-03	1.09E-03
	Emission in each Box of 1st jet	g/s	4.43E-05	3.47E-05	2.36E-05	1.81E-05	1.59E-05	2.38E-05	5.15E-05	1.37E-04	2.44E-04	2.29E-04	2.03E-04	1.89E-04	2.56E-04	2.29E-04	2.52E-04	2.82E-04	3.05E-04	3.37E-04	3.61E-04	3.32E-04	2.37E-04	1.78E-04	1.66E-04	1.36E-04
	Emission in each Box of 2nd jet	g/s	2.36E-05	1.85E-05	1.26E-05	9.67E-06	8.50E-06	1.27E-05	2.75E-05	7.29E-05	1.30E-04	1.22E-04	1.08E-04	1.01E-04	1.36E-04	1.22E-04	1.34E-04	1.51E-04	1.63E-04	1.80E-04	1.92E-04	1.77E-04	1.27E-04	9.51E-05	8.83E-05	7.25E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2582	0.2138	0.2163	0.2280	0.2374	0.4480	0.4722	0.4131	0.4156	0.3984	0.3826	0.3766	0.3413	0.3341	0.3400	0.3647	0.3770	0.3887	0.3985	0.3799	0.3430	0.3238	0.3281	0.3032
	NO2	g/vehicle/km	0.0465	0.0443	0.0438	0.0452	0.0467	0.0575	0.0582	0.0630	0.0747	0.0717	0.0682	0.0663	0.0671	0.0649	0.0669	0.0713	0.0740	0.0767	0.0793	0.0763	0.0674	0.0614	0.0617	0.0577
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0060***	***0.0040***	***0.0028***	***0.0022***	***0.0019***	***0.0044***	***0.0097***	***0.0212***	***0.0320***	***0.0297***	***0.0261***	***0.0246***	***0.0298***	***0.0274***	***0.0295***	***0.0333***	***0.0360***	***0.0400***	***0.0433***	***0.0397***	***0.0294***	***0.0227***	***0.0215***	***0.0175***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.97E-03	2.69E-03	1.87E-03	1.47E-03	1.28E-03	2.90E-03	6.48E-03	1.41E-02	2.13E-02	1.98E-02	1.74E-02	1.64E-02	1.99E-02	1.82E-02	1.96E-02	2.22E-02	2.40E-02	2.67E-02	2.89E-02	2.65E-02	1.96E-02	1.51E-02	1.43E-02	1.17E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.99E-03	1.34E-03	9.36E-04	7.34E-04	6.38E-04	1.45E-03	3.24E-03	7.07E-03	1.07E-02	9.90E-03	8.70E-03	8.20E-03	9.94E-03	9.12E-03	9.82E-03	1.11E-02	1.20E-02	1.33E-02	1.44E-02	1.32E-02	9.79E-03	7.55E-03	7.17E-03	5.84E-03
	Emission in each Box of 1st jet	g/s	2.48E-04	1.68E-04	1.17E-04	9.18E-05	7.97E-05	1.81E-04	4.05E-04	8.84E-04	1.33E-03	1.24E-03	1.09E-03	1.02E-03	1.24E-03	1.14E-03	1.23E-03	1.39E-03	1.50E-03	1.67E-03	1.81E-03	1.66E-03	1.22E-03	9.44E-04	8.96E-04	7.31E-04
	Emission in each Box of 2nd jet	g/s	1.32E-04	8.96E-05	6.24E-05	4.89E-05	4.25E-05	9.68E-05	2.16E-04	4.72E-04	7.10E-04	6.60E-04	5.80E-04	5.47E-04	6.63E-04	6.08E-04	6.55E-04	7.40E-04	8.00E-04	8.88E-04	9.63E-04	8.83E-04	6.53E-04	5.04E-04	4.78E-04	3.90E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0032***	***0.0057***	***0.0053***	***0.0047***	***0.0043***	***0.0059***	***0.0053***	***0.0058***	***0.0065***	***0.0071***	***0.0079***	***0.0086***	***0.0080***	***0.0058***	***0.0043***	***0.0040***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.16E-04	5.57E-04	3.79E-04	2.91E-04	2.51E-04	3.73E-04	8.00E-04	2.16E-03	3.83E-03	3.56E-03	3.10E-03	2.89E-03	3.91E-03	3.54E-03	3.87E-03	4.34E-03	4.71E-03	5.26E-03	5.75E-03	5.32E-03	3.85E-03	2.87E-03	2.70E-03	2.23E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.58E-04	2.78E-04	1.90E-04	1.46E-04	1.25E-04	1.86E-04	4.00E-04	1.08E-03	1.92E-03	1.78E-03	1.55E-03	1.44E-03	1.96E-03	1.77E-03	1.93E-03	2.17E-03	2.35E-03	2.63E-03	2.88E-03	2.66E-03	1.92E-03	1.43E-03	1.35E-03	1.11E-03
	Emission in each Box of 1st jet	g/s	4.47E-05	3.48E-05	2.37E-05	1.82E-05	1.57E-05	2.33E-05	5.00E-05	1.35E-04	2.39E-04	2.23E-04	1.94E-04	1.80E-04	2.44E-04	2.21E-04	2.42E-04	2.71E-04	2.94E-04	3.29E-04	3.60E-04	3.32E-04	2.41E-04	1.79E-04	1.69E-04	1.39E-04
	Emission in each Box of 2nd jet	g/s	2.39E-05	1.86E-05	1.26E-05	9.71E-06	8.36E-06	1.24E-05	2.67E-05	7.19E-05	1.28E-04	1.19E-04	1.03E-04	9.62E-05	1.30E-04	1.18E-04	1.29E-04	1.45E-04	1.57E-04	1.75E-04	1.92E-04	1.77E-04	1.28E-04	9.55E-05	9.00E-05	7.42E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2378	0.1992	0.2035	0.2144	0.2236	0.4263	0.4565	0.4130	0.4136	0.3983	0.3881	0.3777	0.3371	0.3309	0.3331	0.3575	0.3711	0.3773	0.3816	0.3592	0.3213	0.3026	0.3005	0.2721
	NO2	g/vehicle/km	0.0432	0.0416	0.0416	0.0429	0.0443	0.0549	0.0565	0.0631	0.0745	0.0718	0.0693	0.0666	0.0665	0.0644	0.0657	0.0701	0.0730	0.0747	0.0763	0.0725	0.0636	0.0577	0.0569	0.0522
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0055***	***0.0038***	***0.0026***	***0.0021***	***0.0018***	***0.0041***	***0.0094***	***0.0212***	***0.0318***	***0.0297***	***0.0265***	***0.0247***	***0.0295***	***0.0271***	***0.0289***	***0.0326***	***0.0354***	***0.0388***	***0.0415***	***0.0376***	***0.0275***	***0.0212***	***0.0197***	***0.0157***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.66E-03	2.51E-03	1.76E-03	1.38E-03	1.20E-03	2.76E-03	6.27E-03	1.41E-02	2.12E-02	1.98E-02	1.76E-02	1.64E-02	1.96E-02	1.81E-02	1.92E-02	2.18E-02	2.36E-02	2.59E-02	2.77E-02	2.50E-02	1.83E-02	1.41E-02	1.31E-02	1.05E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.83E-03	1.25E-03	8.81E-04	6.90E-04	6.01E-04	1.38E-03	3.13E-03	7.07E-03	1.06E-02	9.89E-03	8.82E-03	8.22E-03	9.82E-03	9.03E-03	9.62E-03	1.09E-02	1.18E-02	1.29E-02	1.38E-02	1.25E-02	9.17E-03	7.06E-03	6.57E-03	5.25E-03
	Emission in each Box of 1st jet	g/s	2.29E-04	1.57E-04	1.10E-04	8.63E-05	7.51E-05	1.73E-04	3.92E-04	8.84E-04	1.33E-03	1.24E-03	1.10E-03	1.03E-03	1.23E-03	1.13E-03	1.20E-03	1.36E-03	1.48E-03	1.62E-03	1.73E-03	1.57E-03	1.15E-03	8.82E-04	8.21E-04	6.56E-04
	Emission in each Box of 2nd jet	g/s	1.22E-04	8.35E-05	5.87E-05	4.60E-05	4.00E-05	9.21E-05	2.09E-04	4.71E-04	7.07E-04	6.60E-04	5.88E-04	5.48E-04	6.55E-04	6.02E-04	6.42E-04	7.25E-04	7.87E-04	8.62E-04	9.22E-04	8.35E-04	6.12E-04	4.71E-04	4.38E-04	3.50E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0012***	***0.0032***	***0.0057***	***0.0054***	***0.0047***	***0.0043***	***0.0058***	***0.0053***	***0.0057***	***0.0064***	***0.0070***	***0.0077***	***0.0083***	***0.0076***	***0.0054***	***0.0040***	***0.0037***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.65E-04	5.24E-04	3.60E-04	2.76E-04	2.38E-04	3.56E-04	7.75E-04	2.16E-03	3.82E-03	3.57E-03	3.15E-03	2.90E-03	3.87E-03	3.51E-03	3.80E-03	4.27E-03	4.64E-03	5.12E-03	5.53E-03	5.05E-03	3.63E-03	2.69E-03	2.49E-03	2.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.32E-04	2.62E-04	1.80E-04	1.38E-04	1.19E-04	1.78E-04	3.88E-04	1.08E-03	1.91E-03	1.78E-03	1.58E-03	1.45E-03	1.94E-03	1.76E-03	1.90E-03	2.13E-03	2.32E-03	2.56E-03	2.76E-03	2.53E-03	1.81E-03	1.35E-03	1.24E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	4.16E-05	3.27E-05	2.25E-05	1.73E-05	1.49E-05	2.23E-05	4.85E-05	1.35E-04	2.39E-04	2.23E-04	1.97E-04	1.81E-04	2.42E-04	2.20E-04	2.37E-04	2.67E-04	2.90E-04	3.20E-04	3.46E-04	3.16E-04	2.27E-04	1.68E-04	1.56E-04	1.26E-04
	Emission in each Box of 2nd jet	g/s	2.22E-05	1.75E-05	1.20E-05	9.21E-06	7.94E-06	1.19E-05	2.58E-05	7.20E-05	1.27E-04	1.19E-04	1.05E-04	9.67E-05	1.29E-04	1.17E-04	1.27E-04	1.42E-04	1.55E-04	1.71E-04	1.84E-04	1.68E-04	1.21E-04	8.97E-05	8.30E-05	6.71E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2291	0.1859	0.1870	0.1947	0.2024	0.3844	0.4057	0.3559	0.3660	0.3522	0.3472	0.3421	0.3103	0.2975	0.3074	0.3264	0.3337	0.3380	0.3431	0.3274	0.2955	0.2844	0.2848	0.2604
	NO2	g/vehicle/km	0.0417	0.0391	0.0385	0.0394	0.0406	0.0499	0.0506	0.0548	0.0665	0.0640	0.0624	0.0607	0.0615	0.0582	0.0609	0.0643	0.0660	0.0672	0.0689	0.0664	0.0587	0.0544	0.0542	0.0501
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0053***	***0.0035***	***0.0024***	***0.0019***	***0.0016***	***0.0037***	***0.0084***	***0.0183***	***0.0281***	***0.0262***	***0.0237***	***0.0223***	***0.0271***	***0.0244***	***0.0266***	***0.0298***	***0.0319***	***0.0348***	***0.0373***	***0.0342***	***0.0253***	***0.0199***	***0.0187***	***0.0151***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.53E-03	2.34E-03	1.62E-03	1.25E-03	1.09E-03	2.49E-03	5.57E-03	1.22E-02	1.88E-02	1.75E-02	1.58E-02	1.49E-02	1.81E-02	1.62E-02	1.78E-02	1.99E-02	2.12E-02	2.32E-02	2.49E-02	2.28E-02	1.69E-02	1.33E-02	1.24E-02	1.00E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.76E-03	1.17E-03	8.09E-04	6.27E-04	5.44E-04	1.25E-03	2.79E-03	6.09E-03	9.38E-03	8.75E-03	7.89E-03	7.45E-03	9.04E-03	8.12E-03	8.88E-03	9.93E-03	1.06E-02	1.16E-02	1.24E-02	1.14E-02	8.44E-03	6.63E-03	6.22E-03	5.02E-03
	Emission in each Box of 1st jet	g/s	2.20E-04	1.46E-04	1.01E-04	7.83E-05	6.80E-05	1.56E-04	3.48E-04	7.62E-04	1.17E-03	1.09E-03	9.86E-04	9.31E-04	1.13E-03	1.01E-03	1.11E-03	1.24E-03	1.33E-03	1.45E-03	1.55E-03	1.43E-03	1.05E-03	8.29E-04	7.78E-04	6.27E-04
	Emission in each Box of 2nd jet	g/s	1.18E-04	7.79E-05	5.40E-05	4.18E-05	3.62E-05	8.31E-05	1.86E-04	4.06E-04	6.25E-04	5.83E-04	5.26E-04	4.97E-04	6.03E-04	5.41E-04	5.92E-04	6.62E-04	7.08E-04	7.73E-04	8.29E-04	7.61E-04	5.62E-04	4.42E-04	4.15E-04	3.35E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0028***	***0.0051***	***0.0048***	***0.0043***	***0.0040***	***0.0054***	***0.0048***	***0.0053***	***0.0059***	***0.0063***	***0.0069***	***0.0075***	***0.0069***	***0.0050***	***0.0038***	***0.0036***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.41E-04	4.92E-04	3.33E-04	2.53E-04	2.18E-04	3.23E-04	6.94E-04	1.88E-03	3.41E-03	3.18E-03	2.84E-03	2.64E-03	3.58E-03	3.18E-03	3.52E-03	3.91E-03	4.20E-03	4.61E-03	4.99E-03	4.63E-03	3.35E-03	2.54E-03	2.37E-03	1.93E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.21E-04	2.46E-04	1.67E-04	1.27E-04	1.09E-04	1.62E-04	3.47E-04	9.39E-04	1.70E-03	1.59E-03	1.42E-03	1.32E-03	1.79E-03	1.59E-03	1.76E-03	1.96E-03	2.10E-03	2.30E-03	2.50E-03	2.31E-03	1.68E-03	1.27E-03	1.18E-03	9.65E-04
	Emission in each Box of 1st jet	g/s	4.01E-05	3.07E-05	2.08E-05	1.58E-05	1.36E-05	2.02E-05	4.34E-05	1.17E-04	2.13E-04	1.99E-04	1.77E-04	1.65E-04	2.24E-04	1.98E-04	2.20E-04	2.44E-04	2.62E-04	2.88E-04	3.12E-04	2.89E-04	2.10E-04	1.59E-04	1.48E-04	1.21E-04
	Emission in each Box of 2nd jet	g/s	2.14E-05	1.64E-05	1.11E-05	8.45E-06	7.27E-06	1.08E-05	2.31E-05	6.26E-05	1.14E-04	1.06E-04	9.45E-05	8.81E-05	1.19E-04	1.06E-04	1.17E-04	1.30E-04	1.40E-04	1.54E-04	1.66E-04	1.54E-04	1.12E-04	8.47E-05	7.89E-05	6.44E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2090	0.1762	0.1821	0.1880	0.1947	0.3673	0.3875	0.3505	0.3647	0.3469	0.3410	0.3302	0.2995	0.2982	0.3043	0.3258	0.3314	0.3424	0.3558	0.3325	0.2992	0.2851	0.2823	0.2638
	NO2	g/vehicle/km	0.0382	0.0372	0.0376	0.0381	0.0392	0.0478	0.0484	0.0541	0.0662	0.0631	0.0613	0.0586	0.0594	0.0583	0.0603	0.0641	0.0655	0.0681	0.0713	0.0673	0.0594	0.0546	0.0537	0.0508
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0048***	***0.0033***	***0.0024***	***0.0018***	***0.0016***	***0.0036***	***0.0080***	***0.0180***	***0.0280***	***0.0259***	***0.0233***	***0.0216***	***0.0262***	***0.0244***	***0.0264***	***0.0297***	***0.0316***	***0.0352***	***0.0387***	***0.0348***	***0.0256***	***0.0200***	***0.0185***	***0.0153***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.22E-03	2.22E-03	1.58E-03	1.21E-03	1.05E-03	2.38E-03	5.32E-03	1.20E-02	1.87E-02	1.72E-02	1.55E-02	1.44E-02	1.74E-02	1.63E-02	1.76E-02	1.98E-02	2.11E-02	2.35E-02	2.58E-02	2.32E-02	1.71E-02	1.33E-02	1.23E-02	1.02E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.61E-03	1.11E-03	7.88E-04	6.05E-04	5.23E-04	1.19E-03	2.66E-03	6.00E-03	9.35E-03	8.62E-03	7.75E-03	7.19E-03	8.72E-03	8.14E-03	8.79E-03	9.91E-03	1.05E-02	1.17E-02	1.29E-02	1.16E-02	8.54E-03	6.65E-03	6.17E-03	5.08E-03
	Emission in each Box of 1st jet	g/s	2.01E-04	1.39E-04	9.85E-05	7.57E-05	6.54E-05	1.49E-04	3.33E-04	7.50E-04	1.17E-03	1.08E-03	9.69E-04	8.99E-04	1.09E-03	1.02E-03	1.10E-03	1.24E-03	1.32E-03	1.47E-03	1.61E-03	1.45E-03	1.07E-03	8.31E-04	7.71E-04	6.36E-04
	Emission in each Box of 2nd jet	g/s	1.07E-04	7.39E-05	5.25E-05	4.04E-05	3.49E-05	7.94E-05	1.77E-04	4.00E-04	6.23E-04	5.75E-04	5.17E-04	4.79E-04	5.81E-04	5.43E-04	5.86E-04	6.61E-04	7.03E-04	7.83E-04	8.60E-04	7.73E-04	5.69E-04	4.43E-04	4.11E-04	3.39E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0028***	***0.0051***	***0.0047***	***0.0042***	***0.0038***	***0.0052***	***0.0048***	***0.0052***	***0.0059***	***0.0063***	***0.0070***	***0.0078***	***0.0070***	***0.0051***	***0.0038***	***0.0035***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.89E-04	4.68E-04	3.26E-04	2.46E-04	2.11E-04	3.10E-04	6.64E-04	1.85E-03	3.40E-03	3.14E-03	2.79E-03	2.55E-03	3.46E-03	3.18E-03	3.48E-03	3.90E-03	4.17E-03	4.67E-03	5.17E-03	4.69E-03	3.39E-03	2.55E-03	2.35E-03	1.96E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.94E-04	2.34E-04	1.63E-04	1.23E-04	1.05E-04	1.55E-04	3.32E-04	9.26E-04	1.70E-03	1.57E-03	1.39E-03	1.28E-03	1.73E-03	1.59E-03	1.74E-03	1.95E-03	2.08E-03	2.33E-03	2.59E-03	2.35E-03	1.70E-03	1.27E-03	1.17E-03	9.79E-04
	Emission in each Box of 1st jet	g/s	3.68E-05	2.93E-05	2.04E-05	1.54E-05	1.32E-05	1.94E-05	4.15E-05	1.16E-04	2.12E-04	1.96E-04	1.74E-04	1.60E-04	2.16E-04	1.99E-04	2.18E-04	2.44E-04	2.60E-04	2.92E-04	3.23E-04	2.93E-04	2.12E-04	1.59E-04	1.47E-04	1.22E-04
	Emission in each Box of 2nd jet	g/s	1.96E-05	1.56E-05	1.09E-05	8.19E-06	7.02E-06	1.03E-05	2.21E-05	6.17E-05	1.13E-04	1.05E-04	9.29E-05	8.51E-05	1.15E-04	1.06E-04	1.16E-04	1.30E-04	1.39E-04	1.56E-04	1.72E-04	1.56E-04	1.13E-04	8.49E-05	7.83E-05	6.52E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involvec	085P2
Road Located	087
Vehicle EF Adopte	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2043	0.1701	0.1746	0.1800	0.1837	0.3580	0.3722	0.3347	0.3459	0.3471	0.3465	0.3461	0.3103	0.3030	0.3103	0.3348	0.3285	0.3380	0.3444	0.3196	0.2801	0.2671	0.2651	0.2406
	NO2	g/vehicle/km	0.0374	0.0360	0.0361	0.0366	0.0371	0.0466	0.0466	0.0517	0.0629	0.0631	0.0623	0.0613	0.0615	0.0592	0.0615	0.0659	0.0650	0.0672	0.0691	0.0648	0.0558	0.0513	0.0506	0.0465
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0047***	***0.0032***	***0.0023***	***0.0017***	***0.0015***	***0.0035***	***0.0077***	***0.0172***	***0.0266***	***0.0259***	***0.0236***	***0.0226***	***0.0271***	***0.0248***	***0.0269***	***0.0306***	***0.0314***	***0.0348***	***0.0375***	***0.0334***	***0.0240***	***0.0187***	***0.0174***	***0.0139***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.15E-03	2.14E-03	1.51E-03	1.16E-03	9.87E-04	2.32E-03	5.11E-03	1.15E-02	1.77E-02	1.72E-02	1.57E-02	1.51E-02	1.81E-02	1.65E-02	1.79E-02	2.04E-02	2.09E-02	2.32E-02	2.50E-02	2.23E-02	1.60E-02	1.25E-02	1.16E-02	9.27E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.57E-03	1.07E-03	7.56E-04	5.80E-04	4.94E-04	1.16E-03	2.56E-03	5.73E-03	8.86E-03	8.62E-03	7.87E-03	7.53E-03	9.04E-03	8.27E-03	8.96E-03	1.02E-02	1.05E-02	1.16E-02	1.25E-02	1.11E-02	8.00E-03	6.23E-03	5.79E-03	4.64E-03
	Emission in each Box of 1st jet	g/s	1.97E-04	1.34E-04	9.45E-05	7.25E-05	6.17E-05	1.45E-04	3.19E-04	7.16E-04	1.11E-03	1.08E-03	9.84E-04	9.42E-04	1.13E-03	1.03E-03	1.12E-03	1.27E-03	1.31E-03	1.45E-03	1.56E-03	1.39E-03	1.00E-03	7.79E-04	7.24E-04	5.80E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.13E-05	5.04E-05	3.86E-05	3.29E-05	7.73E-05	1.70E-04	3.82E-04	5.91E-04	5.75E-04	5.25E-04	5.02E-04	6.03E-04	5.51E-04	5.98E-04	6.79E-04	6.97E-04	7.73E-04	8.32E-04	7.43E-04	5.33E-04	4.15E-04	3.86E-04	3.09E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0027***	***0.0048***	***0.0047***	***0.0042***	***0.0040***	***0.0054***	***0.0048***	***0.0053***	***0.0060***	***0.0062***	***0.0069***	***0.0075***	***0.0068***	***0.0048***	***0.0036***	***0.0033***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.76E-04	4.53E-04	3.13E-04	2.36E-04	1.99E-04	3.02E-04	6.39E-04	1.77E-03	3.23E-03	3.14E-03	2.83E-03	2.67E-03	3.58E-03	3.23E-03	3.55E-03	4.01E-03	4.13E-03	4.61E-03	5.01E-03	4.52E-03	3.18E-03	2.39E-03	2.21E-03	1.79E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.88E-04	2.26E-04	1.56E-04	1.18E-04	9.97E-05	1.51E-04	3.20E-04	8.85E-04	1.61E-03	1.57E-03	1.42E-03	1.34E-03	1.79E-03	1.62E-03	1.78E-03	2.00E-03	2.07E-03	2.30E-03	2.50E-03	2.26E-03	1.59E-03	1.20E-03	1.11E-03	8.96E-04
	Emission in each Box of 1st jet	g/s	3.60E-05	2.83E-05	1.96E-05	1.47E-05	1.25E-05	1.89E-05	4.00E-05	1.11E-04	2.02E-04	1.96E-04	1.77E-04	1.67E-04	2.24E-04	2.02E-04	2.22E-04	2.50E-04	2.58E-04	2.88E-04	3.13E-04	2.83E-04	1.99E-04	1.49E-04	1.38E-04	1.12E-04
	Emission in each Box of 2nd jet	g/s	1.92E-05	1.51E-05	1.04E-05	7.86E-06	6.65E-06	1.01E-05	2.13E-05	5.90E-05	1.08E-04	1.05E-04	9.43E-05	8.90E-05	1.19E-04	1.08E-04	1.18E-04	1.34E-04	1.38E-04	1.54E-04	1.67E-04	1.51E-04	1.06E-04	7.97E-05	7.37E-05	5.97E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2159	0.1748	0.1806	0.1895	0.1947	0.3658	0.3858	0.3332	0.3492	0.3403	0.3388	0.3316	0.3019	0.3025	0.3106	0.3304	0.3502	0.3536	0.3635	0.3378	0.2933	0.2712	0.2748	0.2529
	NO2	g/vehicle/km	0.0395	0.0369	0.0373	0.0384	0.0392	0.0476	0.0482	0.0515	0.0635	0.0619	0.0609	0.0588	0.0598	0.0591	0.0616	0.0650	0.0691	0.0702	0.0728	0.0684	0.0583	0.0520	0.0523	0.0487
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0050***	***0.0033***	***0.0023***	***0.0018***	***0.0016***	***0.0036***	***0.0079***	***0.0171***	***0.0268***	***0.0254***	***0.0231***	***0.0217***	***0.0264***	***0.0248***	***0.0269***	***0.0302***	***0.0334***	***0.0364***	***0.0395***	***0.0353***	***0.0251***	***0.0190***	***0.0180***	***0.0146***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.32E-03	2.20E-03	1.56E-03	1.22E-03	1.05E-03	2.37E-03	5.30E-03	1.14E-02	1.79E-02	1.69E-02	1.54E-02	1.44E-02	1.76E-02	1.65E-02	1.79E-02	2.01E-02	2.23E-02	2.42E-02	2.63E-02	2.36E-02	1.67E-02	1.27E-02	1.20E-02	9.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.66E-03	1.10E-03	7.82E-04	6.10E-04	5.23E-04	1.19E-03	2.65E-03	5.70E-03	8.95E-03	8.45E-03	7.70E-03	7.22E-03	8.79E-03	8.26E-03	8.97E-03	1.01E-02	1.11E-02	1.21E-02	1.32E-02	1.18E-02	8.37E-03	6.33E-03	6.01E-03	4.88E-03
	Emission in each Box of 1st jet	g/s	2.08E-04	1.37E-04	9.77E-05	7.63E-05	6.54E-05	1.48E-04	3.31E-04	7.13E-04	1.12E-03	1.06E-03	9.63E-04	9.02E-04	1.10E-03	1.03E-03	1.12E-03	1.26E-03	1.39E-03	1.52E-03	1.65E-03	1.47E-03	1.05E-03	7.91E-04	7.51E-04	6.09E-04
	Emission in each Box of 2nd jet	g/s	1.11E-04	7.33E-05	5.21E-05	4.07E-05	3.49E-05	7.90E-05	1.77E-04	3.80E-04	5.97E-04	5.64E-04	5.13E-04	4.81E-04	5.86E-04	5.50E-04	5.98E-04	6.70E-04	7.43E-04	8.08E-04	8.78E-04	7.85E-04	5.58E-04	4.22E-04	4.00E-04	3.25E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0026***	***0.0049***	***0.0046***	***0.0042***	***0.0038***	***0.0052***	***0.0048***	***0.0053***	***0.0059***	***0.0066***	***0.0072***	***0.0079***	***0.0072***	***0.0050***	***0.0036***	***0.0034***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.08E-04	4.64E-04	3.23E-04	2.47E-04	2.11E-04	3.08E-04	6.62E-04	1.76E-03	3.26E-03	3.08E-03	2.77E-03	2.56E-03	3.49E-03	3.23E-03	3.56E-03	3.96E-03	4.40E-03	4.81E-03	5.28E-03	4.77E-03	3.33E-03	2.43E-03	2.29E-03	1.88E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.04E-04	2.32E-04	1.62E-04	1.24E-04	1.05E-04	1.54E-04	3.31E-04	8.81E-04	1.63E-03	1.54E-03	1.39E-03	1.28E-03	1.74E-03	1.61E-03	1.78E-03	1.98E-03	2.20E-03	2.41E-03	2.64E-03	2.38E-03	1.67E-03	1.21E-03	1.14E-03	9.39E-04
	Emission in each Box of 1st jet	g/s	3.80E-05	2.90E-05	2.02E-05	1.55E-05	1.32E-05	1.93E-05	4.13E-05	1.10E-04	2.03E-04	1.92E-04	1.73E-04	1.60E-04	2.18E-04	2.02E-04	2.22E-04	2.47E-04	2.75E-04	3.01E-04	3.30E-04	2.98E-04	2.08E-04	1.52E-04	1.43E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	2.03E-05	1.55E-05	1.08E-05	8.25E-06	7.02E-06	1.03E-05	2.21E-05	5.88E-05	1.09E-04	1.03E-04	9.24E-05	8.54E-05	1.16E-04	1.08E-04	1.19E-04	1.32E-04	1.47E-04	1.60E-04	1.76E-04	1.59E-04	1.11E-04	8.09E-05	7.62E-05	6.26E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2144	0.1786	0.1781	0.1818	0.1937	0.3563	0.3775	0.3277	0.3344	0.3253	0.3360	0.3167	0.2969	0.2941	0.3085	0.3135	0.3157	0.3351	0.3474	0.3228	0.2930	0.2736	0.2741	0.2501
	NO2	g/vehicle/km	0.0392	0.0377	0.0368	0.0369	0.0390	0.0464	0.0472	0.0507	0.0609	0.0593	0.0604	0.0563	0.0588	0.0575	0.0611	0.0618	0.0625	0.0666	0.0697	0.0655	0.0583	0.0525	0.0522	0.0482
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0050***	***0.0034***	***0.0023***	***0.0018***	***0.0016***	***0.0035***	***0.0078***	***0.0168***	***0.0257***	***0.0242***	***0.0229***	***0.0207***	***0.0259***	***0.0241***	***0.0267***	***0.0286***	***0.0301***	***0.0345***	***0.0378***	***0.0338***	***0.0251***	***0.0191***	***0.0180***	***0.0145***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.30E-03	2.25E-03	1.54E-03	1.17E-03	1.04E-03	2.31E-03	5.18E-03	1.12E-02	1.71E-02	1.62E-02	1.53E-02	1.38E-02	1.73E-02	1.61E-02	1.78E-02	1.91E-02	2.01E-02	2.30E-02	2.52E-02	2.25E-02	1.67E-02	1.28E-02	1.20E-02	9.64E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.65E-03	1.12E-03	7.71E-04	5.85E-04	5.20E-04	1.15E-03	2.59E-03	5.61E-03	8.57E-03	8.08E-03	7.64E-03	6.90E-03	8.65E-03	8.03E-03	8.91E-03	9.54E-03	1.00E-02	1.15E-02	1.26E-02	1.13E-02	8.37E-03	6.38E-03	5.99E-03	4.82E-03
	Emission in each Box of 1st jet	g/s	2.06E-04	1.40E-04	9.64E-05	7.31E-05	6.50E-05	1.44E-04	3.24E-04	7.01E-04	1.07E-03	1.01E-03	9.55E-04	8.62E-04	1.08E-03	1.00E-03	1.11E-03	1.19E-03	1.26E-03	1.44E-03	1.57E-03	1.41E-03	1.05E-03	7.98E-04	7.49E-04	6.03E-04
	Emission in each Box of 2nd jet	g/s	1.10E-04	7.49E-05	5.14E-05	3.90E-05	3.47E-05	7.70E-05	1.73E-04	3.74E-04	5.71E-04	5.39E-04	5.09E-04	4.60E-04	5.76E-04	5.35E-04	5.94E-04	6.36E-04	6.70E-04	7.66E-04	8.39E-04	7.50E-04	5.58E-04	4.26E-04	3.99E-04	3.21E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0026***	***0.0047***	***0.0044***	***0.0041***	***0.0037***	***0.0051***	***0.0047***	***0.0053***	***0.0056***	***0.0060***	***0.0069***	***0.0076***	***0.0068***	***0.0050***	***0.0037***	***0.0034***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.04E-04	4.74E-04	3.19E-04	2.38E-04	2.09E-04	3.01E-04	6.48E-04	1.73E-03	3.12E-03	2.95E-03	2.75E-03	2.45E-03	3.43E-03	3.14E-03	3.53E-03	3.76E-03	3.98E-03	4.57E-03	5.05E-03	4.57E-03	3.33E-03	2.45E-03	2.28E-03	1.86E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.02E-04	2.37E-04	1.59E-04	1.19E-04	1.05E-04	1.50E-04	3.24E-04	8.67E-04	1.56E-03	1.47E-03	1.37E-03	1.23E-03	1.71E-03	1.57E-03	1.77E-03	1.88E-03	1.99E-03	2.28E-03	2.53E-03	2.28E-03	1.66E-03	1.22E-03	1.14E-03	9.30E-04
	Emission in each Box of 1st jet	g/s	3.77E-05	2.96E-05	1.99E-05	1.49E-05	1.31E-05	1.88E-05	4.05E-05	1.08E-04	1.95E-04	1.84E-04	1.72E-04	1.53E-04	2.14E-04	1.96E-04	2.21E-04	2.35E-04	2.49E-04	2.86E-04	3.16E-04	2.85E-04	2.08E-04	1.53E-04	1.43E-04	1.16E-04
	Emission in each Box of 2nd jet	g/s	2.01E-05	1.58E-05	1.06E-05	7.93E-06	6.98E-06	1.00E-05	2.16E-05	5.78E-05	1.04E-04	9.82E-05	9.15E-05	8.18E-05	1.14E-04	1.05E-04	1.18E-04	1.25E-04	1.33E-04	1.52E-04	1.68E-04	1.52E-04	1.11E-04	8.16E-05	7.60E-05	6.20E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2439	0.2057	0.2066	0.2143	0.2236	0.4287	0.4498	0.3907	0.3973	0.3823	0.3751	0.3703	0.3384	0.3280	0.3321	0.3599	0.3633	0.3754	0.3888	0.3642	0.3287	0.3072	0.3104	0.2884
	NO2	g/vehicle/km	0.0441	0.0428	0.0421	0.0429	0.0443	0.0552	0.0557	0.0598	0.0717	0.0691	0.0671	0.0653	0.0667	0.0638	0.0655	0.0705	0.0715	0.0743	0.0775	0.0734	0.0649	0.0585	0.0587	0.0551
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0056***	***0.0039***	***0.0027***	***0.0021***	***0.0018***	***0.0042***	***0.0093***	***0.0201***	***0.0306***	***0.0285***	***0.0256***	***0.0242***	***0.0296***	***0.0269***	***0.0288***	***0.0328***	***0.0347***	***0.0386***	***0.0423***	***0.0381***	***0.0282***	***0.0215***	***0.0203***	***0.0167***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.75E-03	2.59E-03	1.79E-03	1.38E-03	1.20E-03	2.78E-03	6.18E-03	1.34E-02	2.04E-02	1.90E-02	1.71E-02	1.61E-02	1.97E-02	1.79E-02	1.92E-02	2.19E-02	2.31E-02	2.57E-02	2.82E-02	2.54E-02	1.88E-02	1.43E-02	1.36E-02	1.11E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.88E-03	1.29E-03	8.94E-04	6.90E-04	6.01E-04	1.39E-03	3.09E-03	6.69E-03	1.02E-02	9.50E-03	8.53E-03	8.06E-03	9.86E-03	8.95E-03	9.59E-03	1.09E-02	1.16E-02	1.29E-02	1.41E-02	1.27E-02	9.38E-03	7.17E-03	6.78E-03	5.56E-03
	Emission in each Box of 1st jet	g/s	2.35E-04	1.62E-04	1.12E-04	8.63E-05	7.51E-05	1.74E-04	3.86E-04	8.36E-04	1.27E-03	1.19E-03	1.07E-03	1.01E-03	1.23E-03	1.12E-03	1.20E-03	1.37E-03	1.44E-03	1.61E-03	1.76E-03	1.59E-03	1.17E-03	8.96E-04	8.48E-04	6.95E-04
	Emission in each Box of 2nd jet	g/s	1.25E-04	8.63E-05	5.96E-05	4.60E-05	4.01E-05	9.26E-05	2.06E-04	4.46E-04	6.79E-04	6.33E-04	5.68E-04	5.37E-04	6.57E-04	5.97E-04	6.40E-04	7.30E-04	7.71E-04	8.58E-04	9.40E-04	8.46E-04	6.26E-04	4.78E-04	4.52E-04	3.71E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0031***	***0.0055***	***0.0051***	***0.0046***	***0.0043***	***0.0058***	***0.0052***	***0.0057***	***0.0064***	***0.0068***	***0.0076***	***0.0084***	***0.0077***	***0.0056***	***0.0041***	***0.0038***	***0.0032***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.79E-04	5.38E-04	3.64E-04	2.76E-04	2.38E-04	3.58E-04	7.64E-04	2.05E-03	3.67E-03	3.43E-03	3.05E-03	2.85E-03	3.88E-03	3.48E-03	3.78E-03	4.29E-03	4.55E-03	5.09E-03	5.62E-03	5.12E-03	3.71E-03	2.73E-03	2.56E-03	2.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.40E-04	2.69E-04	1.82E-04	1.38E-04	1.19E-04	1.79E-04	3.82E-04	1.02E-03	1.84E-03	1.72E-03	1.52E-03	1.42E-03	1.94E-03	1.74E-03	1.89E-03	2.14E-03	2.27E-03	2.55E-03	2.81E-03	2.56E-03	1.85E-03	1.36E-03	1.28E-03	1.06E-03
	Emission in each Box of 1st jet	g/s	4.24E-05	3.36E-05	2.28E-05	1.73E-05	1.49E-05	2.24E-05	4.78E-05	1.28E-04	2.30E-04	2.14E-04	1.91E-04	1.78E-04	2.43E-04	2.18E-04	2.37E-04	2.68E-04	2.84E-04	3.18E-04	3.51E-04	3.20E-04	2.32E-04	1.71E-04	1.60E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	2.26E-05	1.79E-05	1.21E-05	9.20E-06	7.93E-06	1.19E-05	2.55E-05	6.82E-05	1.22E-04	1.14E-04	1.02E-04	9.48E-05	1.29E-04	1.16E-04	1.26E-04	1.43E-04	1.52E-04	1.70E-04	1.87E-04	1.71E-04	1.24E-04	9.10E-05	8.55E-05	7.08E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2664	0.2207	0.2248	0.2346	0.2441	0.4637	0.4913	0.4222	0.4292	0.4116	0.4051	0.3942	0.3622	0.3543	0.3604	0.3842	0.3891	0.3996	0.4137	0.3943	0.3518	0.3349	0.3365	0.3110
	NO2	g/vehicle/km	0.0479	0.0457	0.0454	0.0465	0.0479	0.0594	0.0605	0.0644	0.0770	0.0740	0.0720	0.0692	0.0709	0.0684	0.0706	0.0748	0.0761	0.0786	0.0822	0.0790	0.0691	0.0633	0.0632	0.0590
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0062***	***0.0042***	***0.0029***	***0.0023***	***0.0020***	***0.0045***	***0.0101***	***0.0217***	***0.0330***	***0.0307***	***0.0276***	***0.0257***	***0.0316***	***0.0290***	***0.0312***	***0.0351***	***0.0371***	***0.0411***	***0.0450***	***0.0412***	***0.0301***	***0.0234***	***0.0221***	***0.0180***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.10E-03	2.78E-03	1.95E-03	1.51E-03	1.31E-03	3.01E-03	6.75E-03	1.45E-02	2.20E-02	2.05E-02	1.84E-02	1.72E-02	2.11E-02	1.93E-02	2.08E-02	2.34E-02	2.48E-02	2.74E-02	3.00E-02	2.75E-02	2.01E-02	1.56E-02	1.47E-02	1.20E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.05E-03	1.39E-03	9.73E-04	7.55E-04	6.56E-04	1.50E-03	3.37E-03	7.23E-03	1.10E-02	1.02E-02	9.21E-03	8.58E-03	1.05E-02	9.67E-03	1.04E-02	1.17E-02	1.24E-02	1.37E-02	1.50E-02	1.37E-02	1.00E-02	7.81E-03	7.36E-03	5.99E-03
	Emission in each Box of 1st jet	g/s	2.56E-04	1.74E-04	1.22E-04	9.44E-05	8.20E-05	1.88E-04	4.22E-04	9.04E-04	1.38E-03	1.28E-03	1.15E-03	1.07E-03	1.32E-03	1.21E-03	1.30E-03	1.46E-03	1.55E-03	1.71E-03	1.87E-03	1.72E-03	1.26E-03	9.76E-04	9.19E-04	7.49E-04
	Emission in each Box of 2nd jet	g/s	1.37E-04	9.26E-05	6.49E-05	5.03E-05	4.37E-05	1.00E-04	2.25E-04	4.82E-04	7.33E-04	6.82E-04	6.14E-04	5.72E-04	7.03E-04	6.45E-04	6.94E-04	7.79E-04	8.25E-04	9.13E-04	1.00E-03	9.16E-04	6.70E-04	5.21E-04	4.90E-04	4.00E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0033***	***0.0059***	***0.0055***	***0.0049***	***0.0045***	***0.0062***	***0.0056***	***0.0061***	***0.0068***	***0.0073***	***0.0081***	***0.0089***	***0.0083***	***0.0059***	***0.0044***	***0.0041***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.37E-04	5.74E-04	3.93E-04	2.99E-04	2.58E-04	3.85E-04	8.31E-04	2.21E-03	3.95E-03	3.68E-03	3.27E-03	3.01E-03	4.13E-03	3.73E-03	4.08E-03	4.55E-03	4.84E-03	5.39E-03	5.96E-03	5.51E-03	3.95E-03	2.95E-03	2.76E-03	2.28E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.68E-04	2.87E-04	1.96E-04	1.50E-04	1.29E-04	1.93E-04	4.16E-04	1.10E-03	1.97E-03	1.84E-03	1.64E-03	1.51E-03	2.06E-03	1.87E-03	2.04E-03	2.28E-03	2.42E-03	2.70E-03	2.98E-03	2.75E-03	1.97E-03	1.48E-03	1.38E-03	1.14E-03
	Emission in each Box of 1st jet	g/s	4.61E-05	3.59E-05	2.46E-05	1.87E-05	1.61E-05	2.41E-05	5.19E-05	1.38E-04	2.47E-04	2.30E-04	2.04E-04	1.88E-04	2.58E-04	2.33E-04	2.55E-04	2.85E-04	3.03E-04	3.37E-04	3.72E-04	3.44E-04	2.47E-04	1.85E-04	1.73E-04	1.42E-04
	Emission in each Box of 2nd jet	g/s	2.46E-05	1.91E-05	1.31E-05	9.97E-06	8.59E-06	1.28E-05	2.77E-05	7.35E-05	1.32E-04	1.23E-04	1.09E-04	1.00E-04	1.38E-04	1.24E-04	1.36E-04	1.52E-04	1.61E-04	1.80E-04	1.99E-04	1.84E-04	1.32E-04	9.85E-05	9.21E-05	7.59E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																								
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2766	0.2306	0.2350	0.2455	0.2542	0.4778	0.5060	0.4372	0.4417	0.4232	0.4163	0.4081	0.3728	0.3630	0.3696	0.3948	0.4023	0.4171	0.4268	0.4063	0.3635	0.3457	0.3479	0.3229
	NO2	g/vehicle/km	0.0493	0.0472	0.0469	0.0481	0.0494	0.0609	0.0620	0.0662	0.0788	0.0756	0.0735	0.0712	0.0726	0.0698	0.0721	0.0765	0.0784	0.0816	0.0844	0.0810	0.0710	0.0650	0.0650	0.0610
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0064***	***0.0044***	***0.0031***	***0.0024***	***0.0020***	***0.0046***	***0.0104***	***0.0225***	***0.0340***	***0.0315***	***0.0284***	***0.0267***	***0.0326***	***0.0297***	***0.0320***	***0.0360***	***0.0384***	***0.0429***	***0.0464***	***0.0425***	***0.0311***	***0.0242***	***0.0228***	***0.0187***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.26E-03	2.90E-03	2.03E-03	1.58E-03	1.37E-03	3.10E-03	6.95E-03	1.50E-02	2.26E-02	2.10E-02	1.89E-02	1.78E-02	2.17E-02	1.98E-02	2.14E-02	2.40E-02	2.56E-02	2.86E-02	3.09E-02	2.83E-02	2.08E-02	1.61E-02	1.52E-02	1.24E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.13E-03	1.45E-03	1.02E-03	7.90E-04	6.83E-04	1.55E-03	3.47E-03	7.49E-03	1.13E-02	1.05E-02	9.46E-03	8.88E-03	1.09E-02	9.91E-03	1.07E-02	1.20E-02	1.28E-02	1.43E-02	1.55E-02	1.42E-02	1.04E-02	8.06E-03	7.60E-03	6.22E-03
	Emission in each Box of 1st jet	g/s	2.66E-04	1.81E-04	1.27E-04	9.88E-05	8.54E-05	1.94E-04	4.34E-04	9.36E-04	1.42E-03	1.31E-03	1.18E-03	1.11E-03	1.36E-03	1.24E-03	1.33E-03	1.50E-03	1.60E-03	1.79E-03	1.93E-03	1.77E-03	1.30E-03	1.01E-03	9.50E-04	7.78E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	9.67E-05	6.78E-05	5.27E-05	4.55E-05	1.03E-04	2.32E-04	4.99E-04	7.55E-04	7.01E-04	6.31E-04	5.92E-04	7.24E-04	6.61E-04	7.12E-04	8.01E-04	8.53E-04	9.53E-04	1.03E-03	9.44E-04	6.92E-04	5.38E-04	5.07E-04	4.15E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0034***	***0.0061***	***0.0056***	***0.0050***	***0.0046***	***0.0063***	***0.0057***	***0.0062***	***0.0070***	***0.0075***	***0.0084***	***0.0092***	***0.0085***	***0.0061***	***0.0046***	***0.0043***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.60E-04	5.93E-04	4.06E-04	3.09E-04	2.65E-04	3.95E-04	8.51E-04	2.27E-03	4.04E-03	3.76E-03	3.34E-03	3.10E-03	4.23E-03	3.81E-03	4.16E-03	4.66E-03	4.99E-03	5.60E-03	6.12E-03	5.65E-03	4.05E-03	3.03E-03	2.84E-03	2.35E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.80E-04	2.97E-04	2.03E-04	1.55E-04	1.33E-04	1.97E-04	4.26E-04	1.13E-03	2.02E-03	1.88E-03	1.67E-03	1.55E-03	2.11E-03	1.90E-03	2.08E-03	2.33E-03	2.49E-03	2.80E-03	3.06E-03	2.82E-03	2.03E-03	1.52E-03	1.42E-03	1.18E-03
	Emission in each Box of 1st jet	g/s	4.75E-05	3.71E-05	2.54E-05	1.93E-05	1.66E-05	2.47E-05	5.32E-05	1.42E-04	2.53E-04	2.35E-04	2.09E-04	1.94E-04	2.64E-04	2.38E-04	2.60E-04	2.91E-04	3.12E-04	3.50E-04	3.82E-04	3.53E-04	2.53E-04	1.90E-04	1.78E-04	1.47E-04
	Emission in each Box of 2nd jet	g/s	2.53E-05	1.98E-05	1.35E-05	1.03E-05	8.85E-06	1.32E-05	2.84E-05	7.56E-05	1.35E-04	1.25E-04	1.11E-04	1.03E-04	1.41E-04	1.27E-04	1.39E-04	1.55E-04	1.66E-04	1.87E-04	2.04E-04	1.88E-04	1.35E-04	1.01E-04	9.47E-05	7.83E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																								
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2796	0.2350	0.2384	0.2496	0.2579	0.4835	0.5109	0.4435	0.4467	0.4277	0.4187	0.4131	0.3762	0.3679	0.3748	0.4004	0.4122	0.4257	0.4360	0.4136	0.3711	0.3530	0.3518	0.3243
	NO2	g/vehicle/km	0.0497	0.0478	0.0474	0.0486	0.0499	0.0615	0.0625	0.0670	0.0795	0.0763	0.0739	0.0719	0.0730	0.0705	0.0728	0.0773	0.0800	0.0831	0.0859	0.0822	0.0722	0.0661	0.0655	0.0611
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0085***	***0.0057***	***0.0041***	***0.0032***	***0.0028***	***0.0070***	***0.0160***	***0.0314***	***0.0457***	***0.0424***	***0.0381***	***0.0361***	***0.0224***	***0.0205***	***0.0222***	***0.0248***	***0.0267***	***0.0297***	***0.0321***	***0.0291***	***0.0216***	***0.0171***	***0.0158***	***0.0127***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.70E-03	3.82E-03	2.70E-03	2.12E-03	1.85E-03	4.68E-03	1.07E-02	2.10E-02	3.05E-02	2.83E-02	2.54E-02	2.41E-02	1.50E-02	1.37E-02	1.48E-02	1.66E-02	1.78E-02	1.98E-02	2.14E-02	1.94E-02	1.44E-02	1.14E-02	1.06E-02	8.48E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.85E-03	1.91E-03	1.35E-03	1.06E-03	9.24E-04	2.34E-03	5.33E-03	1.05E-02	1.52E-02	1.41E-02	1.27E-02	1.20E-02	7.48E-03	6.84E-03	7.38E-03	8.28E-03	8.89E-03	9.90E-03	1.07E-02	9.71E-03	7.21E-03	5.68E-03	5.28E-03	4.24E-03
	Emission in each Box of 1st jet	g/s	8.14E-04	5.45E-04	3.86E-04	3.03E-04	2.64E-04	6.69E-04	1.52E-03	2.99E-03	4.35E-03	4.04E-03	3.63E-03	3.44E-03	2.14E-03	1.95E-03	2.11E-03	2.37E-03	2.54E-03	2.83E-03	3.06E-03	2.77E-03	2.06E-03	1.62E-03	1.51E-03	1.21E-03
	Emission in each Box of 2nd jet	g/s	4.75E-04	3.18E-04	2.25E-04	1.77E-04	1.54E-04	3.90E-04	8.88E-04	1.75E-03	2.54E-03	2.36E-03	2.12E-03	2.01E-03	1.25E-03	1.14E-03	1.23E-03	1.38E-03	1.48E-03	1.65E-03	1.78E-03	1.62E-03	1.20E-03	9.47E-04	8.80E-04	7.06E-04
NO_2 Emission Rate		g/s	***0.0015***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0020***	***0.0047***	***0.0081***	***0.0076***	***0.0067***	***0.0063***	***0.0044***	***0.0039***	***0.0043***	***0.0048***	***0.0052***	***0.0058***	***0.0063***	***0.0058***	***0.0042***	***0.0032***	***0.0030***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.01E-03	7.77E-04	5.38E-04	4.13E-04	3.58E-04	5.95E-04	1.30E-03	3.17E-03	5.43E-03	5.04E-03	4.48E-03	4.19E-03	2.90E-03	2.62E-03	2.87E-03	3.20E-03	3.45E-03	3.86E-03	4.22E-03	3.86E-03	2.81E-03	2.13E-03	1.97E-03	1.60E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.07E-04	3.88E-04	2.69E-04	2.06E-04	1.79E-04	2.98E-04	6.52E-04	1.58E-03	2.71E-03	2.52E-03	2.24E-03	2.10E-03	1.45E-03	1.31E-03	1.43E-03	1.60E-03	1.73E-03	1.93E-03	2.11E-03	1.93E-03	1.40E-03	1.06E-03	9.84E-04	7.99E-04
	Emission in each Box of 1st jet	g/s	1.45E-04	1.11E-04	7.68E-05	5.90E-05	5.11E-05	8.50E-05	1.86E-04	4.52E-04	7.75E-04	7.20E-04	6.41E-04	5.99E-04	4.15E-04	3.74E-04	4.10E-04	4.57E-04	4.93E-04	5.52E-04	6.02E-04	5.51E-04	4.01E-04	3.04E-04	2.81E-04	2.28E-04
	Emission in each Box of 2nd jet	g/s	8.44E-05	6.47E-05	4.48E-05	3.44E-05	2.98E-05	4.96E-05	1.09E-04	2.64E-04	4.52E-04	4.20E-04	3.74E-04	3.49E-04	2.42E-04	2.18E-04	2.39E-04	2.67E-04	2.88E-04	3.22E-04	3.51E-04	3.22E-04	2.34E-04	1.77E-04	1.64E-04	1.33E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2558	0.2139	0.2161	0.2275	0.2417	0.4589	0.4873	0.4194	0.4232	0.4101	0.4028	0.3955	0.3590	0.3467	0.3556	0.3812	0.3922	0.4003	0.4005	0.3794	0.3386	0.3229	0.3220	0.2964
	NO2	g/vehicle/km	0.0460	0.0442	0.0437	0.0451	0.0475	0.0588	0.0600	0.0639	0.0760	0.0737	0.0715	0.0693	0.0702	0.0670	0.0697	0.0742	0.0766	0.0787	0.0796	0.0761	0.0665	0.0611	0.0606	0.0565
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0078***	***0.0052***	***0.0037***	***0.0029***	***0.0026***	***0.0067***	***0.0152***	***0.0297***	***0.0433***	***0.0407***	***0.0367***	***0.0346***	***0.0214***	***0.0193***	***0.0210***	***0.0237***	***0.0254***	***0.0279***	***0.0295***	***0.0267***	***0.0197***	***0.0156***	***0.0145***	***0.0116***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.21E-03	3.48E-03	2.45E-03	1.93E-03	1.73E-03	4.44E-03	1.02E-02	1.98E-02	2.89E-02	2.71E-02	2.45E-02	2.31E-02	1.43E-02	1.29E-02	1.40E-02	1.58E-02	1.69E-02	1.86E-02	1.97E-02	1.78E-02	1.32E-02	1.04E-02	9.67E-03	7.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.61E-03	1.74E-03	1.23E-03	9.65E-04	8.66E-04	2.22E-03	5.08E-03	9.91E-03	1.44E-02	1.36E-02	1.22E-02	1.15E-02	7.13E-03	6.45E-03	7.01E-03	7.88E-03	8.46E-03	9.31E-03	9.83E-03	8.91E-03	6.58E-03	5.20E-03	4.83E-03	3.87E-03
	Emission in each Box of 1st jet	g/s	7.45E-04	4.97E-04	3.50E-04	2.76E-04	2.47E-04	6.35E-04	1.45E-03	2.83E-03	4.13E-03	3.87E-03	3.49E-03	3.29E-03	2.04E-03	1.84E-03	2.00E-03	2.25E-03	2.42E-03	2.66E-03	2.81E-03	2.54E-03	1.88E-03	1.48E-03	1.38E-03	1.11E-03
	Emission in each Box of 2nd jet	g/s	4.34E-04	2.90E-04	2.04E-04	1.61E-04	1.44E-04	3.70E-04	8.47E-04	1.65E-03	2.41E-03	2.26E-03	2.04E-03	1.92E-03	1.19E-03	1.07E-03	1.17E-03	1.31E-03	1.41E-03	1.55E-03	1.64E-03	1.48E-03	1.10E-03	8.66E-04	8.06E-04	6.46E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0007***	***0.0006***	***0.0005***	***0.0009***	***0.0019***	***0.0045***	***0.0078***	***0.0073***	***0.0065***	***0.0061***	***0.0042***	***0.0037***	***0.0041***	***0.0046***	***0.0050***	***0.0055***	***0.0059***	***0.0054***	***0.0039***	***0.0030***	***0.0027***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.38E-04	7.18E-04	4.95E-04	3.82E-04	3.40E-04	5.69E-04	1.25E-03	3.02E-03	5.19E-03	4.87E-03	4.34E-03	4.04E-03	2.79E-03	2.49E-03	2.74E-03	3.07E-03	3.31E-03	3.66E-03	3.91E-03	3.57E-03	2.59E-03	1.97E-03	1.82E-03	1.48E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.69E-04	3.59E-04	2.48E-04	1.91E-04	1.70E-04	2.85E-04	6.25E-04	1.51E-03	2.59E-03	2.43E-03	2.17E-03	2.02E-03	1.40E-03	1.25E-03	1.37E-03	1.53E-03	1.65E-03	1.83E-03	1.95E-03	1.79E-03	1.29E-03	9.84E-04	9.10E-04	7.38E-04
	Emission in each Box of 1st jet	g/s	1.34E-04	1.03E-04	7.07E-05	5.46E-05	4.86E-05	8.13E-05	1.79E-04	4.31E-04	7.41E-04	6.95E-04	6.20E-04	5.77E-04	3.99E-04	3.56E-04	3.92E-04	4.39E-04	4.73E-04	5.23E-04	5.58E-04	5.11E-04	3.69E-04	2.81E-04	2.60E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	7.82E-05	5.98E-05	4.13E-05	3.19E-05	2.83E-05	4.74E-05	1.04E-04	2.52E-04	4.32E-04	4.06E-04	3.62E-04	3.37E-04	2.33E-04	2.08E-04	2.29E-04	2.56E-04	2.76E-04	3.05E-04	3.26E-04	2.98E-04	2.15E-04	1.64E-04	1.52E-04	1.23E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2582	0.2138	0.2163	0.2280	0.2374	0.4480	0.4722	0.4131	0.4156	0.3984	0.3826	0.3766	0.3413	0.3341	0.3400	0.3647	0.3770	0.3887	0.3985	0.3799	0.3430	0.3238	0.3281	0.3032
	NO2	g/vehicle/km	0.0465	0.0443	0.0438	0.0452	0.0467	0.0575	0.0582	0.0630	0.0747	0.0717	0.0682	0.0663	0.0671	0.0649	0.0669	0.0713	0.0740	0.0767	0.0793	0.0763	0.0674	0.0614	0.0617	0.0577
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0079***	***0.0052***	***0.0037***	***0.0029***	***0.0026***	***0.0065***	***0.0148***	***0.0293***	***0.0425***	***0.0395***	***0.0349***	***0.0329***	***0.0203***	***0.0186***	***0.0201***	***0.0226***	***0.0244***	***0.0271***	***0.0293***	***0.0268***	***0.0200***	***0.0156***	***0.0148***	***0.0119***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.26E-03	3.47E-03	2.45E-03	1.93E-03	1.70E-03	4.34E-03	9.85E-03	1.95E-02	2.84E-02	2.63E-02	2.32E-02	2.20E-02	1.36E-02	1.24E-02	1.34E-02	1.51E-02	1.63E-02	1.81E-02	1.96E-02	1.78E-02	1.33E-02	1.04E-02	9.85E-03	7.93E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.63E-03	1.74E-03	1.23E-03	9.67E-04	8.50E-04	2.17E-03	4.92E-03	9.76E-03	1.42E-02	1.32E-02	1.16E-02	1.10E-02	6.78E-03	6.21E-03	6.70E-03	7.54E-03	8.14E-03	9.04E-03	9.78E-03	8.92E-03	6.66E-03	5.21E-03	4.92E-03	3.96E-03
	Emission in each Box of 1st jet	g/s	7.52E-04	4.96E-04	3.50E-04	2.76E-04	2.43E-04	6.20E-04	1.41E-03	2.79E-03	4.05E-03	3.76E-03	3.32E-03	3.14E-03	1.94E-03	1.77E-03	1.91E-03	2.16E-03	2.32E-03	2.58E-03	2.79E-03	2.55E-03	1.90E-03	1.49E-03	1.41E-03	1.13E-03
	Emission in each Box of 2nd jet	g/s	4.39E-04	2.89E-04	2.04E-04	1.61E-04	1.42E-04	3.61E-04	8.20E-04	1.63E-03	2.36E-03	2.19E-03	1.94E-03	1.83E-03	1.13E-03	1.04E-03	1.12E-03	1.26E-03	1.36E-03	1.51E-03	1.63E-03	1.49E-03	1.11E-03	8.69E-04	8.21E-04	6.61E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0007***	***0.0006***	***0.0005***	***0.0008***	***0.0018***	***0.0045***	***0.0076***	***0.0071***	***0.0062***	***0.0058***	***0.0040***	***0.0036***	***0.0040***	***0.0044***	***0.0048***	***0.0054***	***0.0058***	***0.0054***	***0.0039***	***0.0030***	***0.0028***	***0.0023***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.48E-04	7.19E-04	4.97E-04	3.84E-04	3.34E-04	5.56E-04	1.21E-03	2.98E-03	5.10E-03	4.74E-03	4.14E-03	3.86E-03	2.67E-03	2.41E-03	2.64E-03	2.95E-03	3.19E-03	3.57E-03	3.89E-03	3.58E-03	2.62E-03	1.98E-03	1.85E-03	1.51E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.74E-04	3.60E-04	2.48E-04	1.92E-04	1.67E-04	2.78E-04	6.07E-04	1.49E-03	2.55E-03	2.37E-03	2.07E-03	1.93E-03	1.33E-03	1.21E-03	1.32E-03	1.47E-03	1.60E-03	1.78E-03	1.95E-03	1.79E-03	1.31E-03	9.89E-04	9.27E-04	7.55E-04
	Emission in each Box of 1st jet	g/s	1.35E-04	1.03E-04	7.10E-05	5.48E-05	4.78E-05	7.95E-05	1.73E-04	4.25E-04	7.28E-04	6.77E-04	5.92E-04	5.52E-04	3.81E-04	3.45E-04	3.77E-04	4.21E-04	4.56E-04	5.10E-04	5.56E-04	5.12E-04	3.74E-04	2.82E-04	2.65E-04	2.16E-04
	Emission in each Box of 2nd jet	g/s	7.90E-05	5.99E-05	4.14E-05	3.20E-05	2.79E-05	4.64E-05	1.01E-04	2.48E-04	4.25E-04	3.95E-04	3.45E-04	3.22E-04	2.22E-04	2.01E-04	2.20E-04	2.46E-04	2.66E-04	2.97E-04	3.25E-04	2.98E-04	2.18E-04	1.65E-04	1.54E-04	1.26E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2378	0.1992	0.2035	0.2144	0.2236	0.4263	0.4565	0.4130	0.4136	0.3983	0.3881	0.3777	0.3371	0.3309	0.3331	0.3575	0.3711	0.3773	0.3816	0.3592	0.3213	0.3026	0.3005	0.2721
	NO2	g/vehicle/km	0.0432	0.0416	0.0416	0.0429	0.0443	0.0549	0.0565	0.0631	0.0745	0.0718	0.0693	0.0666	0.0665	0.0644	0.0657	0.0701	0.0730	0.0747	0.0763	0.0725	0.0636	0.0577	0.0569	0.0522
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0073***	***0.0049***	***0.0035***	***0.0027***	***0.0024***	***0.0062***	***0.0143***	***0.0293***	***0.0423***	***0.0395***	***0.0353***	***0.0330***	***0.0201***	***0.0185***	***0.0197***	***0.0222***	***0.0240***	***0.0263***	***0.0281***	***0.0253***	***0.0187***	***0.0146***	***0.0135***	***0.0107***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.85E-03	3.24E-03	2.31E-03	1.82E-03	1.60E-03	4.13E-03	9.52E-03	1.95E-02	2.82E-02	2.63E-02	2.36E-02	2.20E-02	1.34E-02	1.23E-02	1.31E-02	1.48E-02	1.60E-02	1.76E-02	1.87E-02	1.69E-02	1.25E-02	9.74E-03	9.02E-03	7.11E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.42E-03	1.62E-03	1.15E-03	9.10E-04	8.01E-04	2.06E-03	4.76E-03	9.76E-03	1.41E-02	1.32E-02	1.18E-02	1.10E-02	6.70E-03	6.15E-03	6.56E-03	7.39E-03	8.01E-03	8.78E-03	9.36E-03	8.43E-03	6.24E-03	4.87E-03	4.51E-03	3.56E-03
	Emission in each Box of 1st jet	g/s	6.92E-04	4.62E-04	3.30E-04	2.60E-04	2.29E-04	5.90E-04	1.36E-03	2.79E-03	4.03E-03	3.76E-03	3.37E-03	3.15E-03	1.91E-03	1.76E-03	1.88E-03	2.11E-03	2.29E-03	2.51E-03	2.68E-03	2.41E-03	1.78E-03	1.39E-03	1.29E-03	1.02E-03
	Emission in each Box of 2nd jet	g/s	4.04E-04	2.70E-04	1.92E-04	1.52E-04	1.33E-04	3.44E-04	7.93E-04	1.63E-03	2.35E-03	2.19E-03	1.96E-03	1.83E-03	1.12E-03	1.03E-03	1.09E-03	1.23E-03	1.33E-03	1.46E-03	1.56E-03	1.41E-03	1.04E-03	8.12E-04	7.52E-04	5.93E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0045***	***0.0076***	***0.0071***	***0.0063***	***0.0058***	***0.0040***	***0.0036***	***0.0039***	***0.0043***	***0.0047***	***0.0052***	***0.0056***	***0.0051***	***0.0037***	***0.0028***	***0.0026***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.80E-04	6.76E-04	4.71E-04	3.64E-04	3.18E-04	5.32E-04	1.18E-03	2.98E-03	5.09E-03	4.75E-03	4.21E-03	3.88E-03	2.64E-03	2.39E-03	2.59E-03	2.90E-03	3.15E-03	3.47E-03	3.74E-03	3.40E-03	2.47E-03	1.86E-03	1.71E-03	1.37E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.40E-04	3.38E-04	2.36E-04	1.82E-04	1.59E-04	2.66E-04	5.89E-04	1.49E-03	2.54E-03	2.37E-03	2.10E-03	1.94E-03	1.32E-03	1.20E-03	1.29E-03	1.45E-03	1.57E-03	1.74E-03	1.87E-03	1.70E-03	1.23E-03	9.28E-04	8.55E-04	6.83E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	9.66E-05	6.73E-05	5.20E-05	4.54E-05	7.60E-05	1.68E-04	4.26E-04	7.27E-04	6.78E-04	6.01E-04	5.55E-04	3.77E-04	3.42E-04	3.70E-04	4.14E-04	4.50E-04	4.96E-04	5.35E-04	4.86E-04	3.53E-04	2.65E-04	2.44E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	7.34E-05	5.63E-05	3.93E-05	3.04E-05	2.65E-05	4.43E-05	9.81E-05	2.48E-04	4.24E-04	3.96E-04	3.51E-04	3.24E-04	2.20E-04	1.99E-04	2.16E-04	2.42E-04	2.62E-04	2.89E-04	3.12E-04	2.84E-04	2.06E-04	1.55E-04	1.42E-04	1.14E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2291	0.1859	0.1870	0.1947	0.2024	0.3844	0.4057	0.3559	0.3660	0.3522	0.3472	0.3421	0.3103	0.2975	0.3074	0.3264	0.3337	0.3380	0.3431	0.3274	0.2955	0.2844	0.2848	0.2604
	NO2	g/vehicle/km	0.0417	0.0391	0.0385	0.0394	0.0406	0.0499	0.0506	0.0548	0.0665	0.0640	0.0624	0.0607	0.0615	0.0582	0.0609	0.0643	0.0660	0.0672	0.0689	0.0664	0.0587	0.0544	0.0542	0.0501
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0070***	***0.0045***	***0.0032***	***0.0025***	***0.0022***	***0.0056***	***0.0127***	***0.0252***	***0.0375***	***0.0349***	***0.0316***	***0.0299***	***0.0185***	***0.0166***	***0.0182***	***0.0203***	***0.0216***	***0.0236***	***0.0253***	***0.0231***	***0.0172***	***0.0137***	***0.0128***	***0.0102***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.67E-03	3.02E-03	2.12E-03	1.65E-03	1.45E-03	3.72E-03	8.46E-03	1.68E-02	2.50E-02	2.33E-02	2.11E-02	1.99E-02	1.23E-02	1.11E-02	1.21E-02	1.35E-02	1.44E-02	1.57E-02	1.68E-02	1.54E-02	1.15E-02	9.16E-03	8.55E-03	6.81E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.33E-03	1.51E-03	1.06E-03	8.26E-04	7.25E-04	1.86E-03	4.23E-03	8.41E-03	1.25E-02	1.16E-02	1.05E-02	9.97E-03	6.17E-03	5.53E-03	6.06E-03	6.75E-03	7.20E-03	7.86E-03	8.42E-03	7.69E-03	5.74E-03	4.58E-03	4.27E-03	3.40E-03
	Emission in each Box of 1st jet	g/s	6.67E-04	4.31E-04	3.03E-04	2.36E-04	2.07E-04	5.32E-04	1.21E-03	2.40E-03	3.57E-03	3.33E-03	3.01E-03	2.85E-03	1.76E-03	1.58E-03	1.73E-03	1.93E-03	2.06E-03	2.25E-03	2.41E-03	2.20E-03	1.64E-03	1.31E-03	1.22E-03	9.73E-04
	Emission in each Box of 2nd jet	g/s	3.89E-04	2.52E-04	1.77E-04	1.38E-04	1.21E-04	3.10E-04	7.05E-04	1.40E-03	2.08E-03	1.94E-03	1.76E-03	1.66E-03	1.03E-03	9.22E-04	1.01E-03	1.13E-03	1.20E-03	1.31E-03	1.40E-03	1.28E-03	9.57E-04	7.63E-04	7.12E-04	5.67E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0007***	***0.0016***	***0.0039***	***0.0068***	***0.0063***	***0.0057***	***0.0053***	***0.0037***	***0.0032***	***0.0036***	***0.0040***	***0.0043***	***0.0047***	***0.0051***	***0.0047***	***0.0034***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.49E-04	6.35E-04	4.37E-04	3.34E-04	2.91E-04	4.83E-04	1.05E-03	2.59E-03	4.54E-03	4.23E-03	3.79E-03	3.54E-03	2.44E-03	2.16E-03	2.40E-03	2.66E-03	2.85E-03	3.13E-03	3.38E-03	3.12E-03	2.28E-03	1.75E-03	1.63E-03	1.31E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.25E-04	3.17E-04	2.18E-04	1.67E-04	1.45E-04	2.41E-04	5.27E-04	1.30E-03	2.27E-03	2.12E-03	1.89E-03	1.77E-03	1.22E-03	1.08E-03	1.20E-03	1.33E-03	1.42E-03	1.56E-03	1.69E-03	1.56E-03	1.14E-03	8.76E-04	8.13E-04	6.55E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	9.07E-05	6.24E-05	4.77E-05	4.15E-05	6.90E-05	1.51E-04	3.70E-04	6.48E-04	6.04E-04	5.41E-04	5.05E-04	3.49E-04	3.09E-04	3.43E-04	3.80E-04	4.07E-04	4.47E-04	4.83E-04	4.45E-04	3.26E-04	2.50E-04	2.32E-04	1.87E-04
	Emission in each Box of 2nd jet	g/s	7.08E-05	5.29E-05	3.64E-05	2.78E-05	2.42E-05	4.02E-05	8.79E-05	2.16E-04	3.78E-04	3.53E-04	3.16E-04	2.95E-04	2.04E-04	1.80E-04	2.00E-04	2.22E-04	2.37E-04	2.61E-04	2.82E-04	2.60E-04	1.90E-04	1.46E-04	1.36E-04	1.09E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2090	0.1762	0.1821	0.1880	0.1947	0.3673	0.3875	0.3505	0.3647	0.3469	0.3410	0.3302	0.2995	0.2982	0.3043	0.3258	0.3314	0.3424	0.3558	0.3325	0.2992	0.2851	0.2823	0.2638
	NO2	g/vehicle/km	0.0382	0.0372	0.0376	0.0381	0.0392	0.0478	0.0484	0.0541	0.0662	0.0631	0.0613	0.0586	0.0594	0.0583	0.0603	0.0641	0.0655	0.0681	0.0713	0.0673	0.0594	0.0546	0.0537	0.0508
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0064***	***0.0043***	***0.0031***	***0.0024***	***0.0021***	***0.0053***	***0.0121***	***0.0248***	***0.0373***	***0.0344***	***0.0311***	***0.0289***	***0.0179***	***0.0166***	***0.0180***	***0.0202***	***0.0215***	***0.0239***	***0.0262***	***0.0234***	***0.0174***	***0.0138***	***0.0127***	***0.0103***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.26E-03	2.86E-03	2.07E-03	1.60E-03	1.39E-03	3.56E-03	8.08E-03	1.66E-02	2.49E-02	2.29E-02	2.07E-02	1.92E-02	1.19E-02	1.11E-02	1.20E-02	1.35E-02	1.43E-02	1.59E-02	1.75E-02	1.56E-02	1.16E-02	9.18E-03	8.47E-03	6.90E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.13E-03	1.43E-03	1.03E-03	7.98E-04	6.97E-04	1.78E-03	4.04E-03	8.28E-03	1.24E-02	1.15E-02	1.04E-02	9.62E-03	5.95E-03	5.55E-03	6.00E-03	6.74E-03	7.15E-03	7.96E-03	8.73E-03	7.80E-03	5.81E-03	4.59E-03	4.24E-03	3.45E-03
	Emission in each Box of 1st jet	g/s	6.09E-04	4.09E-04	2.95E-04	2.28E-04	1.99E-04	5.08E-04	1.15E-03	2.37E-03	3.55E-03	3.28E-03	2.96E-03	2.75E-03	1.70E-03	1.58E-03	1.71E-03	1.93E-03	2.04E-03	2.28E-03	2.49E-03	2.23E-03	1.66E-03	1.31E-03	1.21E-03	9.85E-04
	Emission in each Box of 2nd jet	g/s	3.55E-04	2.39E-04	1.72E-04	1.33E-04	1.16E-04	2.96E-04	6.73E-04	1.38E-03	2.07E-03	1.91E-03	1.73E-03	1.60E-03	9.92E-04	9.24E-04	9.99E-04	1.12E-03	1.19E-03	1.33E-03	1.46E-03	1.30E-03	9.69E-04	7.65E-04	7.06E-04	5.75E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0038***	***0.0068***	***0.0063***	***0.0056***	***0.0051***	***0.0035***	***0.0033***	***0.0036***	***0.0040***	***0.0042***	***0.0047***	***0.0053***	***0.0047***	***0.0035***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.79E-04	6.05E-04	4.27E-04	3.24E-04	2.81E-04	4.62E-04	1.01E-03	2.55E-03	4.52E-03	4.17E-03	3.72E-03	3.42E-03	2.36E-03	2.17E-03	2.38E-03	2.65E-03	2.83E-03	3.17E-03	3.50E-03	3.16E-03	2.31E-03	1.76E-03	1.61E-03	1.33E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.90E-04	3.02E-04	2.13E-04	1.62E-04	1.40E-04	2.31E-04	5.04E-04	1.28E-03	2.26E-03	2.09E-03	1.86E-03	1.71E-03	1.18E-03	1.08E-03	1.19E-03	1.33E-03	1.41E-03	1.58E-03	1.75E-03	1.58E-03	1.15E-03	8.79E-04	8.07E-04	6.64E-04
	Emission in each Box of 1st jet	g/s	1.11E-04	8.64E-05	6.10E-05	4.62E-05	4.01E-05	6.61E-05	1.44E-04	3.65E-04	6.46E-04	5.96E-04	5.32E-04	4.88E-04	3.37E-04	3.10E-04	3.39E-04	3.79E-04	4.04E-04	4.52E-04	5.00E-04	4.52E-04	3.30E-04	2.51E-04	2.30E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	6.49E-05	5.04E-05	3.56E-05	2.70E-05	2.34E-05	3.85E-05	8.40E-05	2.13E-04	3.77E-04	3.48E-04	3.10E-04	2.85E-04	1.97E-04	1.81E-04	1.98E-04	2.21E-04	2.36E-04	2.64E-04	2.92E-04	2.63E-04	1.92E-04	1.46E-04	1.34E-04	1.11E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2043	0.1701	0.1746	0.1800	0.1837	0.3580	0.3722	0.3347	0.3459	0.3471	0.3465	0.3461	0.3103	0.3030	0.3103	0.3348	0.3285	0.3380	0.3444	0.3196	0.2801	0.2671	0.2651	0.2406
	NO2	g/vehicle/km	0.0374	0.0360	0.0361	0.0366	0.0371	0.0466	0.0466	0.0517	0.0629	0.0631	0.0623	0.0613	0.0615	0.0592	0.0615	0.0659	0.0650	0.0672	0.0691	0.0648	0.0558	0.0513	0.0506	0.0465
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0062***	***0.0041***	***0.0030***	***0.0023***	***0.0020***	***0.0052***	***0.0116***	***0.0237***	***0.0354***	***0.0344***	***0.0316***	***0.0303***	***0.0185***	***0.0169***	***0.0183***	***0.0208***	***0.0213***	***0.0236***	***0.0254***	***0.0225***	***0.0163***	***0.0129***	***0.0119***	***0.0094***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.16E-03	2.76E-03	1.98E-03	1.53E-03	1.32E-03	3.47E-03	7.76E-03	1.58E-02	2.36E-02	2.29E-02	2.10E-02	2.02E-02	1.23E-02	1.13E-02	1.22E-02	1.38E-02	1.42E-02	1.57E-02	1.69E-02	1.50E-02	1.09E-02	8.60E-03	7.96E-03	6.29E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.08E-03	1.38E-03	9.90E-04	7.64E-04	6.58E-04	1.73E-03	3.88E-03	7.91E-03	1.18E-02	1.15E-02	1.05E-02	1.01E-02	6.17E-03	5.63E-03	6.11E-03	6.92E-03	7.09E-03	7.86E-03	8.45E-03	7.50E-03	5.44E-03	4.30E-03	3.98E-03	3.14E-03
	Emission in each Box of 1st jet	g/s	5.95E-04	3.95E-04	2.83E-04	2.18E-04	1.88E-04	4.95E-04	1.11E-03	2.26E-03	3.37E-03	3.28E-03	3.01E-03	2.88E-03	1.76E-03	1.61E-03	1.75E-03	1.98E-03	2.03E-03	2.25E-03	2.42E-03	2.14E-03	1.55E-03	1.23E-03	1.14E-03	8.98E-04
	Emission in each Box of 2nd jet	g/s	3.47E-04	2.30E-04	1.65E-04	1.27E-04	1.10E-04	2.89E-04	6.47E-04	1.32E-03	1.97E-03	1.91E-03	1.75E-03	1.68E-03	1.03E-03	9.39E-04	1.02E-03	1.15E-03	1.18E-03	1.31E-03	1.41E-03	1.25E-03	9.07E-04	7.17E-04	6.63E-04	5.24E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0037***	***0.0064***	***0.0063***	***0.0057***	***0.0054***	***0.0037***	***0.0033***	***0.0036***	***0.0041***	***0.0042***	***0.0047***	***0.0051***	***0.0046***	***0.0033***	***0.0025***	***0.0023***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.63E-04	5.85E-04	4.10E-04	3.11E-04	2.66E-04	4.51E-04	9.71E-04	2.44E-03	4.29E-03	4.17E-03	3.78E-03	3.58E-03	2.44E-03	2.20E-03	2.42E-03	2.72E-03	2.80E-03	3.13E-03	3.39E-03	3.04E-03	2.17E-03	1.65E-03	1.52E-03	1.22E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.82E-04	2.93E-04	2.05E-04	1.55E-04	1.33E-04	2.26E-04	4.86E-04	1.22E-03	2.15E-03	2.09E-03	1.89E-03	1.79E-03	1.22E-03	1.10E-03	1.21E-03	1.36E-03	1.40E-03	1.56E-03	1.70E-03	1.52E-03	1.08E-03	8.25E-04	7.59E-04	6.08E-04
	Emission in each Box of 1st jet	g/s	1.09E-04	8.36E-05	5.86E-05	4.44E-05	3.80E-05	6.45E-05	1.39E-04	3.49E-04	6.13E-04	5.96E-04	5.40E-04	5.11E-04	3.49E-04	3.14E-04	3.46E-04	3.89E-04	4.01E-04	4.47E-04	4.85E-04	4.35E-04	3.10E-04	2.36E-04	2.17E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	6.36E-05	4.88E-05	3.42E-05	2.59E-05	2.22E-05	3.76E-05	8.09E-05	2.04E-04	3.58E-04	3.48E-04	3.15E-04	2.98E-04	2.04E-04	1.83E-04	2.02E-04	2.27E-04	2.34E-04	2.60E-04	2.83E-04	2.54E-04	1.81E-04	1.38E-04	1.27E-04	1.01E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2159	0.1748	0.1806	0.1895	0.1947	0.3658	0.3858	0.3332	0.3492	0.3403	0.3388	0.3316	0.3019	0.3025	0.3106	0.3304	0.3502	0.3536	0.3635	0.3378	0.2933	0.2712	0.2748	0.2529
	NO2	g/vehicle/km	0.0395	0.0369	0.0373	0.0384	0.0392	0.0476	0.0482	0.0515	0.0635	0.0619	0.0609	0.0588	0.0598	0.0591	0.0616	0.0650	0.0691	0.0702	0.0728	0.0684	0.0583	0.0520	0.0523	0.0487
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0066***	***0.0043***	***0.0031***	***0.0024***	***0.0021***	***0.0053***	***0.0121***	***0.0236***	***0.0357***	***0.0337***	***0.0309***	***0.0290***	***0.0180***	***0.0169***	***0.0184***	***0.0205***	***0.0227***	***0.0247***	***0.0268***	***0.0238***	***0.0171***	***0.0131***	***0.0124***	***0.0099***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.40E-03	2.84E-03	2.05E-03	1.61E-03	1.39E-03	3.54E-03	8.05E-03	1.57E-02	2.38E-02	2.25E-02	2.06E-02	1.93E-02	1.20E-02	1.12E-02	1.22E-02	1.37E-02	1.51E-02	1.65E-02	1.78E-02	1.59E-02	1.14E-02	8.73E-03	8.25E-03	6.61E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.20E-03	1.42E-03	1.02E-03	8.04E-04	6.97E-04	1.77E-03	4.02E-03	7.87E-03	1.19E-02	1.12E-02	1.03E-02	9.66E-03	6.00E-03	5.62E-03	6.12E-03	6.83E-03	7.56E-03	8.23E-03	8.92E-03	7.93E-03	5.70E-03	4.37E-03	4.12E-03	3.31E-03
	Emission in each Box of 1st jet	g/s	6.29E-04	4.06E-04	2.93E-04	2.30E-04	1.99E-04	5.06E-04	1.15E-03	2.25E-03	3.40E-03	3.21E-03	2.94E-03	2.76E-03	1.71E-03	1.61E-03	1.75E-03	1.95E-03	2.16E-03	2.35E-03	2.55E-03	2.27E-03	1.63E-03	1.25E-03	1.18E-03	9.45E-04
	Emission in each Box of 2nd jet	g/s	3.67E-04	2.37E-04	1.71E-04	1.34E-04	1.16E-04	2.95E-04	6.70E-04	1.31E-03	1.99E-03	1.87E-03	1.71E-03	1.61E-03	1.00E-03	9.37E-04	1.02E-03	1.14E-03	1.26E-03	1.37E-03	1.49E-03	1.32E-03	9.50E-04	7.28E-04	6.87E-04	5.51E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0036***	***0.0065***	***0.0061***	***0.0056***	***0.0051***	***0.0036***	***0.0033***	***0.0036***	***0.0040***	***0.0045***	***0.0049***	***0.0054***	***0.0048***	***0.0034***	***0.0025***	***0.0024***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.04E-04	6.00E-04	4.23E-04	3.26E-04	2.81E-04	4.60E-04	1.00E-03	2.43E-03	4.33E-03	4.09E-03	3.70E-03	3.43E-03	2.38E-03	2.20E-03	2.43E-03	2.69E-03	2.98E-03	3.27E-03	3.57E-03	3.21E-03	2.27E-03	1.67E-03	1.57E-03	1.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.02E-04	3.00E-04	2.12E-04	1.63E-04	1.40E-04	2.30E-04	5.02E-04	1.22E-03	2.17E-03	2.05E-03	1.85E-03	1.72E-03	1.19E-03	1.10E-03	1.21E-03	1.35E-03	1.49E-03	1.63E-03	1.79E-03	1.61E-03	1.13E-03	8.37E-04	7.85E-04	6.37E-04
	Emission in each Box of 1st jet	g/s	1.15E-04	8.56E-05	6.05E-05	4.66E-05	4.01E-05	6.58E-05	1.44E-04	3.47E-04	6.19E-04	5.85E-04	5.29E-04	4.90E-04	3.40E-04	3.14E-04	3.46E-04	3.84E-04	4.26E-04	4.67E-04	5.11E-04	4.59E-04	3.24E-04	2.39E-04	2.24E-04	1.82E-04
	Emission in each Box of 2nd jet	g/s	6.70E-05	5.00E-05	3.53E-05	2.72E-05	2.34E-05	3.84E-05	8.37E-05	2.03E-04	3.61E-04	3.41E-04	3.08E-04	2.86E-04	1.98E-04	1.83E-04	2.02E-04	2.24E-04	2.48E-04	2.72E-04	2.98E-04	2.68E-04	1.89E-04	1.40E-04	1.31E-04	1.06E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2144	0.1786	0.1781	0.1818	0.1937	0.3563	0.3775	0.3277	0.3344	0.3253	0.3360	0.3167	0.2969	0.2941	0.3085	0.3135	0.3157	0.3351	0.3474	0.3228	0.2930	0.2736	0.2741	0.2501
	NO2	g/vehicle/km	0.0392	0.0377	0.0368	0.0369	0.0390	0.0464	0.0472	0.0507	0.0609	0.0593	0.0604	0.0563	0.0588	0.0575	0.0611	0.0618	0.0625	0.0666	0.0697	0.0655	0.0583	0.0525	0.0522	0.0482
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0066***	***0.0044***	***0.0030***	***0.0023***	***0.0021***	***0.0052***	***0.0118***	***0.0232***	***0.0342***	***0.0323***	***0.0306***	***0.0277***	***0.0177***	***0.0164***	***0.0182***	***0.0195***	***0.0204***	***0.0234***	***0.0256***	***0.0227***	***0.0171***	***0.0132***	***0.0123***	***0.0098***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.37E-03	2.90E-03	2.02E-03	1.54E-03	1.39E-03	3.45E-03	7.87E-03	1.55E-02	2.28E-02	2.15E-02	2.04E-02	1.85E-02	1.18E-02	1.09E-02	1.22E-02	1.30E-02	1.36E-02	1.56E-02	1.71E-02	1.52E-02	1.14E-02	8.81E-03	8.23E-03	6.54E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.19E-03	1.45E-03	1.01E-03	7.71E-04	6.94E-04	1.72E-03	3.94E-03	7.74E-03	1.14E-02	1.08E-02	1.02E-02	9.23E-03	5.90E-03	5.47E-03	6.08E-03	6.48E-03	6.81E-03	7.80E-03	8.53E-03	7.58E-03	5.69E-03	4.41E-03	4.11E-03	3.27E-03
	Emission in each Box of 1st jet	g/s	6.24E-04	4.14E-04	2.89E-04	2.20E-04	1.98E-04	4.93E-04	1.12E-03	2.21E-03	3.26E-03	3.07E-03	2.91E-03	2.64E-03	1.69E-03	1.56E-03	1.74E-03	1.85E-03	1.95E-03	2.23E-03	2.44E-03	2.17E-03	1.63E-03	1.26E-03	1.18E-03	9.34E-04
	Emission in each Box of 2nd jet	g/s	3.64E-04	2.42E-04	1.68E-04	1.29E-04	1.16E-04	2.87E-04	6.56E-04	1.29E-03	1.90E-03	1.79E-03	1.70E-03	1.54E-03	9.83E-04	9.11E-04	1.01E-03	1.08E-03	1.14E-03	1.30E-03	1.42E-03	1.26E-03	9.49E-04	7.34E-04	6.86E-04	5.45E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0036***	***0.0062***	***0.0059***	***0.0055***	***0.0049***	***0.0035***	***0.0032***	***0.0036***	***0.0038***	***0.0040***	***0.0047***	***0.0051***	***0.0046***	***0.0034***	***0.0025***	***0.0024***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.99E-04	6.12E-04	4.18E-04	3.13E-04	2.79E-04	4.49E-04	9.84E-04	2.39E-03	4.16E-03	3.92E-03	3.67E-03	3.28E-03	2.34E-03	2.14E-03	2.41E-03	2.56E-03	2.70E-03	3.10E-03	3.42E-03	3.07E-03	2.26E-03	1.69E-03	1.57E-03	1.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.00E-04	3.06E-04	2.09E-04	1.57E-04	1.40E-04	2.25E-04	4.92E-04	1.20E-03	2.08E-03	1.96E-03	1.83E-03	1.64E-03	1.17E-03	1.07E-03	1.20E-03	1.28E-03	1.35E-03	1.55E-03	1.71E-03	1.54E-03	1.13E-03	8.44E-04	7.83E-04	6.30E-04
	Emission in each Box of 1st jet	g/s	1.14E-04	8.75E-05	5.97E-05	4.48E-05	3.99E-05	6.42E-05	1.41E-04	3.42E-04	5.94E-04	5.60E-04	5.24E-04	4.69E-04	3.34E-04	3.05E-04	3.44E-04	3.65E-04	3.86E-04	4.43E-04	4.89E-04	4.39E-04	3.23E-04	2.41E-04	2.24E-04	1.80E-04
	Emission in each Box of 2nd jet	g/s	6.66E-05	5.10E-05	3.48E-05	2.61E-05	2.33E-05	3.74E-05	8.20E-05	1.99E-04	3.47E-04	3.27E-04	3.06E-04	2.74E-04	1.95E-04	1.78E-04	2.01E-04	2.13E-04	2.25E-04	2.58E-04	2.85E-04	2.56E-04	1.89E-04	1.41E-04	1.31E-04	1.05E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2439	0.2057	0.2066	0.2143	0.2236	0.4287	0.4498	0.3907	0.3973	0.3823	0.3751	0.3703	0.3384	0.3280	0.3321	0.3599	0.3633	0.3754	0.3888	0.3642	0.3287	0.3072	0.3104	0.2884
	NO2	g/vehicle/km	0.0441	0.0428	0.0421	0.0429	0.0443	0.0552	0.0557	0.0598	0.0717	0.0691	0.0671	0.0653	0.0667	0.0638	0.0655	0.0705	0.0715	0.0743	0.0775	0.0734	0.0649	0.0585	0.0587	0.0551
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0075***	***0.0050***	***0.0035***	***0.0027***	***0.0024***	***0.0062***	***0.0141***	***0.0277***	***0.0407***	***0.0379***	***0.0342***	***0.0324***	***0.0202***	***0.0183***	***0.0196***	***0.0223***	***0.0235***	***0.0262***	***0.0286***	***0.0257***	***0.0192***	***0.0148***	***0.0140***	***0.0113***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.97E-03	3.34E-03	2.34E-03	1.82E-03	1.60E-03	4.15E-03	9.38E-03	1.85E-02	2.71E-02	2.53E-02	2.28E-02	2.16E-02	1.34E-02	1.22E-02	1.31E-02	1.49E-02	1.57E-02	1.75E-02	1.91E-02	1.71E-02	1.28E-02	9.89E-03	9.32E-03	7.54E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.49E-03	1.67E-03	1.17E-03	9.09E-04	8.01E-04	2.07E-03	4.69E-03	9.23E-03	1.36E-02	1.26E-02	1.14E-02	1.08E-02	6.72E-03	6.10E-03	6.54E-03	7.44E-03	7.84E-03	8.73E-03	9.54E-03	8.55E-03	6.38E-03	4.94E-03	4.66E-03	3.77E-03
	Emission in each Box of 1st jet	g/s	7.10E-04	4.78E-04	3.35E-04	2.60E-04	2.29E-04	5.93E-04	1.34E-03	2.64E-03	3.87E-03	3.61E-03	3.25E-03	3.08E-03	1.92E-03	1.74E-03	1.87E-03	2.13E-03	2.24E-03	2.49E-03	2.73E-03	2.44E-03	1.82E-03	1.41E-03	1.33E-03	1.08E-03
	Emission in each Box of 2nd jet	g/s	4.14E-04	2.79E-04	1.95E-04	1.52E-04	1.34E-04	3.46E-04	7.82E-04	1.54E-03	2.26E-03	2.11E-03	1.90E-03	1.80E-03	1.12E-03	1.02E-03	1.09E-03	1.24E-03	1.31E-03	1.46E-03	1.59E-03	1.43E-03	1.06E-03	8.24E-04	7.76E-04	6.28E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0017***	***0.0042***	***0.0073***	***0.0068***	***0.0061***	***0.0057***	***0.0040***	***0.0036***	***0.0039***	***0.0044***	***0.0046***	***0.0052***	***0.0057***	***0.0052***	***0.0038***	***0.0028***	***0.0026***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.99E-04	6.95E-04	4.77E-04	3.64E-04	3.17E-04	5.34E-04	1.16E-03	2.82E-03	4.89E-03	4.57E-03	4.07E-03	3.81E-03	2.65E-03	2.37E-03	2.58E-03	2.92E-03	3.09E-03	3.45E-03	3.80E-03	3.45E-03	2.52E-03	1.88E-03	1.76E-03	1.44E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.50E-04	3.47E-04	2.39E-04	1.82E-04	1.59E-04	2.67E-04	5.80E-04	1.41E-03	2.44E-03	2.28E-03	2.04E-03	1.90E-03	1.32E-03	1.19E-03	1.29E-03	1.46E-03	1.54E-03	1.73E-03	1.90E-03	1.72E-03	1.26E-03	9.42E-04	8.81E-04	7.21E-04
	Emission in each Box of 1st jet	g/s	1.28E-04	9.93E-05	6.82E-05	5.20E-05	4.53E-05	7.63E-05	1.66E-04	4.04E-04	6.98E-04	6.52E-04	5.82E-04	5.44E-04	3.78E-04	3.39E-04	3.69E-04	4.16E-04	4.41E-04	4.94E-04	5.44E-04	4.92E-04	3.60E-04	2.69E-04	2.52E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	7.49E-05	5.79E-05	3.98E-05	3.03E-05	2.64E-05	4.45E-05	9.67E-05	2.35E-04	4.07E-04	3.80E-04	3.39E-04	3.17E-04	2.21E-04	1.98E-04	2.15E-04	2.43E-04	2.57E-04	2.88E-04	3.17E-04	2.87E-04	2.10E-04	1.57E-04	1.47E-04	1.20E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2664	0.2207	0.2248	0.2346	0.2441	0.4637	0.4913	0.4222	0.4292	0.4116	0.4051	0.3942	0.3622	0.3543	0.3604	0.3842	0.3891	0.3996	0.4137	0.3943	0.3518	0.3349	0.3365	0.3110
	NO2	g/vehicle/km	0.0479	0.0457	0.0454	0.0465	0.0479	0.0594	0.0605	0.0644	0.0770	0.0740	0.0720	0.0692	0.0709	0.0684	0.0706	0.0748	0.0761	0.0786	0.0822	0.0790	0.0691	0.0633	0.0632	0.0590
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0081***	***0.0054***	***0.0038***	***0.0030***	***0.0026***	***0.0067***	***0.0154***	***0.0299***	***0.0439***	***0.0408***	***0.0369***	***0.0345***	***0.0216***	***0.0198***	***0.0213***	***0.0238***	***0.0252***	***0.0279***	***0.0305***	***0.0278***	***0.0205***	***0.0162***	***0.0152***	***0.0122***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.43E-03	3.59E-03	2.55E-03	1.99E-03	1.75E-03	4.49E-03	1.02E-02	1.99E-02	2.93E-02	2.72E-02	2.46E-02	2.30E-02	1.44E-02	1.32E-02	1.42E-02	1.59E-02	1.68E-02	1.86E-02	2.03E-02	1.85E-02	1.37E-02	1.08E-02	1.01E-02	8.13E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.72E-03	1.79E-03	1.28E-03	9.95E-04	8.74E-04	2.24E-03	5.12E-03	9.97E-03	1.46E-02	1.36E-02	1.23E-02	1.15E-02	7.20E-03	6.59E-03	7.10E-03	7.95E-03	8.40E-03	9.30E-03	1.02E-02	9.26E-03	6.83E-03	5.39E-03	5.05E-03	4.07E-03
	Emission in each Box of 1st jet	g/s	7.76E-04	5.12E-04	3.64E-04	2.84E-04	2.50E-04	6.41E-04	1.46E-03	2.85E-03	4.18E-03	3.89E-03	3.51E-03	3.28E-03	2.06E-03	1.88E-03	2.03E-03	2.27E-03	2.40E-03	2.66E-03	2.90E-03	2.64E-03	1.95E-03	1.54E-03	1.44E-03	1.16E-03
	Emission in each Box of 2nd jet	g/s	4.53E-04	2.99E-04	2.13E-04	1.66E-04	1.46E-04	3.74E-04	8.54E-04	1.66E-03	2.44E-03	2.27E-03	2.05E-03	1.92E-03	1.20E-03	1.10E-03	1.18E-03	1.32E-03	1.40E-03	1.55E-03	1.69E-03	1.54E-03	1.14E-03	8.98E-04	8.42E-04	6.78E-04
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0019***	***0.0046***	***0.0079***	***0.0073***	***0.0066***	***0.0060***	***0.0042***	***0.0038***	***0.0042***	***0.0046***	***0.0049***	***0.0055***	***0.0061***	***0.0056***	***0.0040***	***0.0031***	***0.0028***	***0.0023***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.76E-04	7.42E-04	5.15E-04	3.94E-04	3.43E-04	5.75E-04	1.26E-03	3.04E-03	5.25E-03	4.89E-03	4.37E-03	4.03E-03	2.82E-03	2.54E-03	2.78E-03	3.10E-03	3.29E-03	3.66E-03	4.03E-03	3.71E-03	2.68E-03	2.04E-03	1.90E-03	1.54E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.88E-04	3.71E-04	2.57E-04	1.97E-04	1.72E-04	2.88E-04	6.31E-04	1.52E-03	2.63E-03	2.44E-03	2.18E-03	2.02E-03	1.41E-03	1.27E-03	1.39E-03	1.55E-03	1.64E-03	1.83E-03	2.02E-03	1.85E-03	1.34E-03	1.02E-03	9.49E-04	7.72E-04
	Emission in each Box of 1st jet	g/s	1.39E-04	1.06E-04	7.35E-05	5.63E-05	4.91E-05	8.22E-05	1.80E-04	4.35E-04	7.50E-04	6.99E-04	6.24E-04	5.76E-04	4.02E-04	3.63E-04	3.98E-04	4.42E-04	4.69E-04	5.23E-04	5.76E-04	5.30E-04	3.84E-04	2.91E-04	2.71E-04	2.21E-04
	Emission in each Box of 2nd jet	g/s	8.13E-05	6.18E-05	4.29E-05	3.29E-05	2.86E-05	4.79E-05	1.05E-04	2.54E-04	4.38E-04	4.07E-04	3.64E-04	3.36E-04	2.35E-04	2.12E-04	2.32E-04	2.58E-04	2.74E-04	3.05E-04	3.36E-04	3.09E-04	2.24E-04	1.70E-04	1.58E-04	1.29E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2766	0.2306	0.2350	0.2455	0.2542	0.4778	0.5060	0.4372	0.4417	0.4232	0.4163	0.4081	0.3728	0.3630	0.3696	0.3948	0.4023	0.4171	0.4268	0.4063	0.3635	0.3457	0.3479	0.3229
	NO2	g/vehicle/km	0.0493	0.0472	0.0469	0.0481	0.0494	0.0609	0.0620	0.0662	0.0788	0.0756	0.0735	0.0712	0.0726	0.0698	0.0721	0.0765	0.0784	0.0816	0.0844	0.0810	0.0710	0.0650	0.0650	0.0610
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0085***	***0.0056***	***0.0040***	***0.0031***	***0.0027***	***0.0069***	***0.0158***	***0.0310***	***0.0452***	***0.0420***	***0.0379***	***0.0357***	***0.0222***	***0.0203***	***0.0218***	***0.0245***	***0.0260***	***0.0291***	***0.0314***	***0.0286***	***0.0212***	***0.0167***	***0.0157***	***0.0127***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.64E-03	3.75E-03	2.67E-03	2.08E-03	1.82E-03	4.62E-03	1.06E-02	2.07E-02	3.01E-02	2.80E-02	2.53E-02	2.38E-02	1.48E-02	1.35E-02	1.46E-02	1.63E-02	1.74E-02	1.94E-02	2.09E-02	1.91E-02	1.41E-02	1.11E-02	1.04E-02	8.44E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.82E-03	1.87E-03	1.33E-03	1.04E-03	9.11E-04	2.31E-03	5.28E-03	1.03E-02	1.51E-02	1.40E-02	1.26E-02	1.19E-02	7.41E-03	6.75E-03	7.28E-03	8.17E-03	8.68E-03	9.70E-03	1.05E-02	9.54E-03	7.06E-03	5.57E-03	5.22E-03	4.22E-03
	Emission in each Box of 1st jet	g/s	8.06E-04	5.35E-04	3.81E-04	2.98E-04	2.60E-04	6.61E-04	1.51E-03	2.95E-03	4.31E-03	4.00E-03	3.61E-03	3.40E-03	2.12E-03	1.93E-03	2.08E-03	2.33E-03	2.48E-03	2.77E-03	2.99E-03	2.73E-03	2.02E-03	1.59E-03	1.49E-03	1.21E-03
	Emission in each Box of 2nd jet	g/s	4.70E-04	3.12E-04	2.22E-04	1.74E-04	1.52E-04	3.85E-04	8.79E-04	1.72E-03	2.51E-03	2.33E-03	2.11E-03	1.98E-03	1.23E-03	1.13E-03	1.21E-03	1.36E-03	1.45E-03	1.62E-03	1.75E-03	1.59E-03	1.18E-03	9.28E-04	8.70E-04	7.03E-04
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0019***	***0.0047***	***0.0081***	***0.0075***	***0.0067***	***0.0062***	***0.0043***	***0.0039***	***0.0043***	***0.0047***	***0.0051***	***0.0057***	***0.0062***	***0.0057***	***0.0041***	***0.0031***	***0.0029***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.01E-03	7.66E-04	5.32E-04	4.08E-04	3.54E-04	5.89E-04	1.29E-03	3.13E-03	5.38E-03	5.00E-03	4.47E-03	4.15E-03	2.88E-03	2.59E-03	2.84E-03	3.17E-03	3.38E-03	3.80E-03	4.14E-03	3.80E-03	2.76E-03	2.09E-03	1.95E-03	1.59E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.03E-04	3.83E-04	2.66E-04	2.04E-04	1.77E-04	2.95E-04	6.46E-04	1.56E-03	2.69E-03	2.50E-03	2.23E-03	2.07E-03	1.44E-03	1.30E-03	1.42E-03	1.58E-03	1.69E-03	1.90E-03	2.07E-03	1.90E-03	1.38E-03	1.05E-03	9.76E-04	7.97E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	1.09E-04	7.60E-05	5.83E-05	5.06E-05	8.42E-05	1.85E-04	4.47E-04	7.68E-04	7.14E-04	6.38E-04	5.93E-04	4.12E-04	3.71E-04	4.06E-04	4.52E-04	4.83E-04	5.43E-04	5.91E-04	5.43E-04	3.94E-04	2.99E-04	2.79E-04	2.28E-04
	Emission in each Box of 2nd jet	g/s	8.38E-05	6.38E-05	4.43E-05	3.40E-05	2.95E-05	4.91E-05	1.08E-04	2.61E-04	4.48E-04	4.17E-04	3.72E-04	3.46E-04	2.40E-04	2.16E-04	2.37E-04	2.64E-04	2.82E-04	3.16E-04	3.45E-04	3.17E-04	2.30E-04	1.74E-04	1.63E-04	1.33E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2780	0.2437	0.2423	0.2580	0.2659	0.4390	0.4573	0.3937	0.4137	0.3963	0.3758	0.3703	0.3769	0.3729	0.3666	0.3772	0.3868	0.4084	0.4145	0.3905	0.3604	0.3662	0.3547	0.3333
	NO2	g/vehicle/km	0.0532	0.0517	0.0510	0.0522	0.0534	0.0622	0.0625	0.0655	0.0787	0.0756	0.0715	0.0697	0.0627	0.0610	0.0605	0.0624	0.0645	0.0681	0.0702	0.0670	0.0601	0.0577	0.0556	0.0530
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0060***	***0.0043***	***0.0029***	***0.0023***	***0.0020***	***0.0040***	***0.0088***	***0.0189***	***0.0298***	***0.0276***	***0.0240***	***0.0226***	***0.0219***	***0.0203***	***0.0211***	***0.0228***	***0.0245***	***0.0278***	***0.0298***	***0.0269***	***0.0205***	***0.0172***	***0.0155***	***0.0128***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.02E-03	2.87E-03	1.96E-03	1.55E-03	1.34E-03	2.65E-03	5.88E-03	1.26E-02	1.98E-02	1.84E-02	1.60E-02	1.51E-02	1.46E-02	1.35E-02	1.41E-02	1.52E-02	1.63E-02	1.85E-02	1.99E-02	1.80E-02	1.37E-02	1.14E-02	1.03E-02	8.50E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.01E-03	1.44E-03	9.79E-04	7.73E-04	6.69E-04	1.33E-03	2.94E-03	6.30E-03	9.92E-03	9.21E-03	8.00E-03	7.55E-03	7.30E-03	6.76E-03	7.04E-03	7.60E-03	8.16E-03	9.27E-03	9.93E-03	8.98E-03	6.83E-03	5.72E-03	5.17E-03	4.25E-03
	Emission in each Box of 1st jet	g/s	5.74E-04	4.10E-04	2.80E-04	2.21E-04	1.91E-04	3.79E-04	8.40E-04	1.80E-03	2.83E-03	2.63E-03	2.29E-03	2.16E-03	2.08E-03	1.93E-03	2.01E-03	2.17E-03	2.33E-03	2.65E-03	2.84E-03	2.56E-03	1.95E-03	1.63E-03	1.48E-03	1.21E-03
	Emission in each Box of 2nd jet	g/s	1.01E-03	7.18E-04	4.90E-04	3.86E-04	3.34E-04	6.64E-04	1.47E-03	3.15E-03	4.96E-03	4.61E-03	4.00E-03	3.77E-03	3.65E-03	3.38E-03	3.52E-03	3.80E-03	4.08E-03	4.64E-03	4.97E-03	4.49E-03	3.41E-03	2.86E-03	2.59E-03	2.13E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0031***	***0.0057***	***0.0053***	***0.0046***	***0.0043***	***0.0036***	***0.0033***	***0.0035***	***0.0038***	***0.0041***	***0.0046***	***0.0050***	***0.0046***	***0.0034***	***0.0027***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.70E-04	6.10E-04	4.12E-04	3.13E-04	2.69E-04	3.76E-04	8.04E-04	2.10E-03	3.77E-03	3.52E-03	3.04E-03	2.84E-03	2.43E-03	2.21E-03	2.32E-03	2.52E-03	2.72E-03	3.09E-03	3.36E-03	3.08E-03	2.28E-03	1.80E-03	1.62E-03	1.35E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.85E-04	3.05E-04	2.06E-04	1.56E-04	1.34E-04	1.88E-04	4.02E-04	1.05E-03	1.89E-03	1.76E-03	1.52E-03	1.42E-03	1.21E-03	1.11E-03	1.16E-03	1.26E-03	1.36E-03	1.55E-03	1.68E-03	1.54E-03	1.14E-03	9.01E-04	8.10E-04	6.76E-04
	Emission in each Box of 1st jet	g/s	1.10E-04	8.71E-05	5.88E-05	4.47E-05	3.84E-05	5.37E-05	1.15E-04	3.00E-04	5.39E-04	5.02E-04	4.35E-04	4.06E-04	3.47E-04	3.16E-04	3.32E-04	3.60E-04	3.89E-04	4.41E-04	4.80E-04	4.40E-04	3.25E-04	2.57E-04	2.32E-04	1.93E-04
	Emission in each Box of 2nd jet	g/s	1.92E-04	1.52E-04	1.03E-04	7.82E-05	6.72E-05	9.40E-05	2.01E-04	5.24E-04	9.43E-04	8.79E-04	7.61E-04	7.10E-04	6.07E-04	5.53E-04	5.81E-04	6.29E-04	6.81E-04	7.73E-04	8.41E-04	7.70E-04	5.69E-04	4.51E-04	4.05E-04	3.38E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2545	0.2224	0.2201	0.2356	0.2496	0.4167	0.4360	0.3722	0.3920	0.3800	0.3616	0.3545	0.3592	0.3511	0.3474	0.3586	0.3675	0.3835	0.3801	0.3575	0.3283	0.3345	0.3243	0.3043
	NO2	g/vehicle/km	0.0493	0.0478	0.0469	0.0484	0.0509	0.0595	0.0600	0.0625	0.0752	0.0730	0.0692	0.0672	0.0602	0.0580	0.0579	0.0599	0.0618	0.0644	0.0650	0.0620	0.0553	0.0533	0.0514	0.0489
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0055***	***0.0039***	***0.0027***	***0.0021***	***0.0019***	***0.0038***	***0.0084***	***0.0179***	***0.0282***	***0.0265***	***0.0231***	***0.0217***	***0.0209***	***0.0191***	***0.0200***	***0.0217***	***0.0233***	***0.0261***	***0.0273***	***0.0247***	***0.0187***	***0.0157***	***0.0142***	***0.0116***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.68E-03	2.62E-03	1.78E-03	1.41E-03	1.26E-03	2.52E-03	5.61E-03	1.19E-02	1.88E-02	1.77E-02	1.54E-02	1.45E-02	1.39E-02	1.27E-02	1.33E-02	1.45E-02	1.55E-02	1.74E-02	1.82E-02	1.64E-02	1.24E-02	1.04E-02	9.46E-03	7.76E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.84E-03	1.31E-03	8.90E-04	7.06E-04	6.28E-04	1.26E-03	2.80E-03	5.96E-03	9.40E-03	8.84E-03	7.70E-03	7.23E-03	6.95E-03	6.37E-03	6.67E-03	7.23E-03	7.75E-03	8.71E-03	9.11E-03	8.22E-03	6.22E-03	5.22E-03	4.73E-03	3.88E-03
	Emission in each Box of 1st jet	g/s	5.26E-04	3.74E-04	2.54E-04	2.02E-04	1.79E-04	3.60E-04	8.01E-04	1.70E-03	2.69E-03	2.52E-03	2.20E-03	2.06E-03	1.99E-03	1.82E-03	1.91E-03	2.07E-03	2.22E-03	2.49E-03	2.60E-03	2.35E-03	1.78E-03	1.49E-03	1.35E-03	1.11E-03
	Emission in each Box of 2nd jet	g/s	9.20E-04	6.55E-04	4.45E-04	3.53E-04	3.14E-04	6.30E-04	1.40E-03	2.98E-03	4.70E-03	4.42E-03	3.85E-03	3.61E-03	3.48E-03	3.18E-03	3.34E-03	3.61E-03	3.88E-03	4.35E-03	4.55E-03	4.11E-03	3.11E-03	2.61E-03	2.36E-03	1.94E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0012***	***0.0030***	***0.0054***	***0.0051***	***0.0044***	***0.0041***	***0.0035***	***0.0032***	***0.0033***	***0.0036***	***0.0039***	***0.0044***	***0.0047***	***0.0043***	***0.0031***	***0.0025***	***0.0022***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.13E-04	5.64E-04	3.79E-04	2.90E-04	2.56E-04	3.60E-04	7.72E-04	2.00E-03	3.61E-03	3.40E-03	2.95E-03	2.74E-03	2.33E-03	2.10E-03	2.22E-03	2.41E-03	2.61E-03	2.93E-03	3.11E-03	2.85E-03	2.10E-03	1.67E-03	1.50E-03	1.25E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.56E-04	2.82E-04	1.90E-04	1.45E-04	1.28E-04	1.80E-04	3.86E-04	1.00E-03	1.80E-03	1.70E-03	1.47E-03	1.37E-03	1.17E-03	1.05E-03	1.11E-03	1.21E-03	1.30E-03	1.46E-03	1.56E-03	1.43E-03	1.05E-03	8.33E-04	7.49E-04	6.23E-04
	Emission in each Box of 1st jet	g/s	1.02E-04	8.05E-05	5.42E-05	4.14E-05	3.65E-05	5.14E-05	1.10E-04	2.86E-04	5.15E-04	4.85E-04	4.21E-04	3.91E-04	3.33E-04	3.01E-04	3.18E-04	3.45E-04	3.72E-04	4.18E-04	4.45E-04	4.07E-04	2.99E-04	2.38E-04	2.14E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	1.78E-04	1.41E-04	9.49E-05	7.25E-05	6.39E-05	9.00E-05	1.93E-04	5.00E-04	9.01E-04	8.49E-04	7.37E-04	6.85E-04	5.83E-04	5.26E-04	5.56E-04	6.03E-04	6.52E-04	7.32E-04	7.78E-04	7.13E-04	5.24E-04	4.16E-04	3.75E-04	3.12E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2569	0.2222	0.2203	0.2362	0.2452	0.4068	0.4225	0.3667	0.3850	0.3693	0.3434	0.3376	0.3412	0.3380	0.3318	0.3427	0.3530	0.3721	0.3782	0.3579	0.3325	0.3354	0.3304	0.3113
	NO2	g/vehicle/km	0.0498	0.0479	0.0471	0.0486	0.0500	0.0581	0.0583	0.0616	0.0739	0.0711	0.0660	0.0643	0.0576	0.0561	0.0556	0.0575	0.0596	0.0628	0.0647	0.0622	0.0560	0.0536	0.0523	0.0500
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0056***	***0.0039***	***0.0027***	***0.0021***	***0.0018***	***0.0037***	***0.0081***	***0.0176***	***0.0277***	***0.0258***	***0.0219***	***0.0206***	***0.0198***	***0.0184***	***0.0191***	***0.0207***	***0.0223***	***0.0253***	***0.0272***	***0.0247***	***0.0189***	***0.0157***	***0.0145***	***0.0119***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.72E-03	2.62E-03	1.78E-03	1.41E-03	1.23E-03	2.46E-03	5.43E-03	1.17E-02	1.85E-02	1.72E-02	1.46E-02	1.38E-02	1.32E-02	1.23E-02	1.27E-02	1.38E-02	1.49E-02	1.69E-02	1.81E-02	1.65E-02	1.26E-02	1.05E-02	9.64E-03	7.94E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.86E-03	1.31E-03	8.90E-04	7.07E-04	6.17E-04	1.23E-03	2.72E-03	5.87E-03	9.23E-03	8.59E-03	7.31E-03	6.88E-03	6.60E-03	6.13E-03	6.37E-03	6.91E-03	7.45E-03	8.45E-03	9.06E-03	8.23E-03	6.30E-03	5.24E-03	4.82E-03	3.97E-03
	Emission in each Box of 1st jet	g/s	5.31E-04	3.74E-04	2.54E-04	2.02E-04	1.76E-04	3.51E-04	7.76E-04	1.68E-03	2.64E-03	2.45E-03	2.09E-03	1.97E-03	1.89E-03	1.75E-03	1.82E-03	1.97E-03	2.13E-03	2.41E-03	2.59E-03	2.35E-03	1.80E-03	1.50E-03	1.38E-03	1.13E-03
	Emission in each Box of 2nd jet	g/s	9.29E-04	6.55E-04	4.45E-04	3.54E-04	3.08E-04	6.15E-04	1.36E-03	2.93E-03	4.62E-03	4.29E-03	3.66E-03	3.44E-03	3.30E-03	3.06E-03	3.19E-03	3.45E-03	3.72E-03	4.22E-03	4.53E-03	4.11E-03	3.15E-03	2.62E-03	2.41E-03	1.98E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0030***	***0.0053***	***0.0050***	***0.0042***	***0.0039***	***0.0033***	***0.0031***	***0.0032***	***0.0035***	***0.0038***	***0.0043***	***0.0047***	***0.0043***	***0.0032***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.20E-04	5.65E-04	3.81E-04	2.91E-04	2.52E-04	3.52E-04	7.49E-04	1.97E-03	3.54E-03	3.31E-03	2.81E-03	2.62E-03	2.23E-03	2.04E-03	2.14E-03	2.32E-03	2.51E-03	2.85E-03	3.10E-03	2.86E-03	2.12E-03	1.67E-03	1.53E-03	1.28E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.60E-04	2.82E-04	1.90E-04	1.45E-04	1.26E-04	1.76E-04	3.75E-04	9.86E-04	1.77E-03	1.65E-03	1.41E-03	1.31E-03	1.11E-03	1.02E-03	1.07E-03	1.16E-03	1.26E-03	1.42E-03	1.55E-03	1.43E-03	1.06E-03	8.37E-04	7.63E-04	6.38E-04
	Emission in each Box of 1st jet	g/s	1.03E-04	8.07E-05	5.44E-05	4.16E-05	3.59E-05	5.02E-05	1.07E-04	2.82E-04	5.06E-04	4.72E-04	4.02E-04	3.74E-04	3.18E-04	2.91E-04	3.05E-04	3.31E-04	3.59E-04	4.07E-04	4.43E-04	4.08E-04	3.03E-04	2.39E-04	2.18E-04	1.82E-04
	Emission in each Box of 2nd jet	g/s	1.80E-04	1.41E-04	9.52E-05	7.27E-05	6.29E-05	8.79E-05	1.87E-04	4.93E-04	8.86E-04	8.27E-04	7.03E-04	6.55E-04	5.57E-04	5.09E-04	5.34E-04	5.80E-04	6.29E-04	7.12E-04	7.75E-04	7.14E-04	5.31E-04	4.18E-04	3.82E-04	3.19E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2367	0.2073	0.2075	0.2224	0.2311	0.3871	0.4084	0.3665	0.3831	0.3691	0.3483	0.3385	0.3370	0.3348	0.3250	0.3358	0.3471	0.3610	0.3618	0.3381	0.3111	0.3133	0.3024	0.2791
	NO2	g/vehicle/km	0.0463	0.0451	0.0447	0.0461	0.0475	0.0556	0.0565	0.0617	0.0738	0.0712	0.0671	0.0646	0.0569	0.0556	0.0545	0.0565	0.0588	0.0611	0.0622	0.0590	0.0528	0.0503	0.0482	0.0453
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0051***	***0.0037***	***0.0025***	***0.0020***	***0.0017***	***0.0035***	***0.0079***	***0.0176***	***0.0276***	***0.0257***	***0.0222***	***0.0207***	***0.0196***	***0.0182***	***0.0187***	***0.0203***	***0.0220***	***0.0246***	***0.0260***	***0.0233***	***0.0177***	***0.0147***	***0.0132***	***0.0107***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.42E-03	2.44E-03	1.68E-03	1.33E-03	1.16E-03	2.34E-03	5.25E-03	1.17E-02	1.84E-02	1.72E-02	1.48E-02	1.38E-02	1.30E-02	1.21E-02	1.25E-02	1.35E-02	1.46E-02	1.64E-02	1.73E-02	1.55E-02	1.18E-02	9.79E-03	8.82E-03	7.12E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.71E-03	1.22E-03	8.39E-04	6.66E-04	5.81E-04	1.17E-03	2.63E-03	5.86E-03	9.18E-03	8.58E-03	7.42E-03	6.90E-03	6.52E-03	6.07E-03	6.24E-03	6.77E-03	7.32E-03	8.19E-03	8.67E-03	7.77E-03	5.89E-03	4.89E-03	4.41E-03	3.56E-03
	Emission in each Box of 1st jet	g/s	4.89E-04	3.49E-04	2.40E-04	1.90E-04	1.66E-04	3.34E-04	7.50E-04	1.68E-03	2.62E-03	2.45E-03	2.12E-03	1.97E-03	1.86E-03	1.73E-03	1.78E-03	1.93E-03	2.09E-03	2.34E-03	2.48E-03	2.22E-03	1.68E-03	1.40E-03	1.26E-03	1.02E-03
	Emission in each Box of 2nd jet	g/s	8.56E-04	6.11E-04	4.19E-04	3.33E-04	2.91E-04	5.85E-04	1.31E-03	2.93E-03	4.59E-03	4.29E-03	3.71E-03	3.45E-03	3.26E-03	3.04E-03	3.12E-03	3.39E-03	3.66E-03	4.10E-03	4.34E-03	3.89E-03	2.95E-03	2.45E-03	2.20E-03	1.78E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0030***	***0.0053***	***0.0050***	***0.0043***	***0.0040***	***0.0033***	***0.0030***	***0.0031***	***0.0034***	***0.0037***	***0.0042***	***0.0045***	***0.0041***	***0.0030***	***0.0024***	***0.0021***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.69E-04	5.31E-04	3.61E-04	2.76E-04	2.39E-04	3.36E-04	7.27E-04	1.98E-03	3.54E-03	3.31E-03	2.86E-03	2.63E-03	2.20E-03	2.02E-03	2.10E-03	2.28E-03	2.48E-03	2.78E-03	2.98E-03	2.71E-03	2.00E-03	1.57E-03	1.41E-03	1.15E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.34E-04	2.66E-04	1.81E-04	1.38E-04	1.19E-04	1.68E-04	3.63E-04	9.88E-04	1.77E-03	1.66E-03	1.43E-03	1.32E-03	1.10E-03	1.01E-03	1.05E-03	1.14E-03	1.24E-03	1.39E-03	1.49E-03	1.36E-03	1.00E-03	7.85E-04	7.03E-04	5.77E-04
	Emission in each Box of 1st jet	g/s	9.56E-05	7.59E-05	5.16E-05	3.95E-05	3.41E-05	4.80E-05	1.04E-04	2.82E-04	5.05E-04	4.73E-04	4.08E-04	3.76E-04	3.15E-04	2.88E-04	2.99E-04	3.25E-04	3.55E-04	3.97E-04	4.26E-04	3.88E-04	2.86E-04	2.24E-04	2.01E-04	1.65E-04
	Emission in each Box of 2nd jet	g/s	1.67E-04	1.33E-04	9.03E-05	6.91E-05	5.97E-05	8.40E-05	1.82E-04	4.94E-04	8.84E-04	8.28E-04	7.14E-04	6.58E-04	5.51E-04	5.04E-04	5.24E-04	5.69E-04	6.21E-04	6.94E-04	7.45E-04	6.78E-04	5.00E-04	3.93E-04	3.52E-04	2.89E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2281	0.1937	0.1909	0.2022	0.2094	0.3492	0.3630	0.3159	0.3392	0.3265	0.3115	0.3068	0.3098	0.3006	0.2996	0.3062	0.3117	0.3229	0.3249	0.3078	0.2857	0.2942	0.2864	0.2670
	NO2	g/vehicle/km	0.0446	0.0423	0.0415	0.0423	0.0435	0.0505	0.0506	0.0537	0.0658	0.0635	0.0605	0.0588	0.0526	0.0503	0.0505	0.0518	0.0531	0.0550	0.0562	0.0540	0.0488	0.0474	0.0458	0.0434
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0049***	***0.0034***	***0.0023***	***0.0018***	***0.0016***	***0.0032***	***0.0070***	***0.0152***	***0.0244***	***0.0228***	***0.0199***	***0.0188***	***0.0180***	***0.0164***	***0.0173***	***0.0185***	***0.0197***	***0.0220***	***0.0234***	***0.0212***	***0.0162***	***0.0138***	***0.0125***	***0.0102***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.30E-03	2.28E-03	1.54E-03	1.21E-03	1.05E-03	2.11E-03	4.67E-03	1.01E-02	1.63E-02	1.52E-02	1.33E-02	1.25E-02	1.20E-02	1.09E-02	1.15E-02	1.23E-02	1.32E-02	1.47E-02	1.56E-02	1.41E-02	1.08E-02	9.19E-03	8.35E-03	6.81E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.65E-03	1.14E-03	7.71E-04	6.05E-04	5.27E-04	1.06E-03	2.33E-03	5.05E-03	8.13E-03	7.59E-03	6.63E-03	6.25E-03	6.00E-03	5.45E-03	5.75E-03	6.17E-03	6.58E-03	7.33E-03	7.79E-03	7.07E-03	5.41E-03	4.59E-03	4.18E-03	3.40E-03
	Emission in each Box of 1st jet	g/s	4.71E-04	3.26E-04	2.20E-04	1.73E-04	1.50E-04	3.02E-04	6.67E-04	1.44E-03	2.32E-03	2.17E-03	1.90E-03	1.79E-03	1.71E-03	1.56E-03	1.64E-03	1.76E-03	1.88E-03	2.09E-03	2.22E-03	2.02E-03	1.55E-03	1.31E-03	1.19E-03	9.73E-04
	Emission in each Box of 2nd jet	g/s	8.25E-04	5.70E-04	3.86E-04	3.03E-04	2.63E-04	5.28E-04	1.17E-03	2.53E-03	4.07E-03	3.80E-03	3.32E-03	3.13E-03	3.00E-03	2.73E-03	2.88E-03	3.09E-03	3.29E-03	3.67E-03	3.89E-03	3.54E-03	2.71E-03	2.30E-03	2.09E-03	1.70E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0026***	***0.0047***	***0.0044***	***0.0039***	***0.0036***	***0.0031***	***0.0027***	***0.0029***	***0.0031***	***0.0034***	***0.0037***	***0.0040***	***0.0037***	***0.0028***	***0.0022***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.46E-04	4.99E-04	3.35E-04	2.53E-04	2.19E-04	3.05E-04	6.51E-04	1.72E-03	3.15E-03	2.95E-03	2.58E-03	2.40E-03	2.04E-03	1.82E-03	1.94E-03	2.09E-03	2.24E-03	2.50E-03	2.69E-03	2.48E-03	1.85E-03	1.48E-03	1.34E-03	1.11E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.23E-04	2.49E-04	1.68E-04	1.27E-04	1.09E-04	1.53E-04	3.25E-04	8.59E-04	1.58E-03	1.48E-03	1.29E-03	1.20E-03	1.02E-03	9.12E-04	9.70E-04	1.04E-03	1.12E-03	1.25E-03	1.35E-03	1.24E-03	9.24E-04	7.41E-04	6.68E-04	5.53E-04
	Emission in each Box of 1st jet	g/s	9.22E-05	7.12E-05	4.79E-05	3.62E-05	3.13E-05	4.36E-05	9.30E-05	2.45E-04	4.51E-04	4.22E-04	3.68E-04	3.43E-04	2.91E-04	2.61E-04	2.77E-04	2.98E-04	3.20E-04	3.57E-04	3.85E-04	3.55E-04	2.64E-04	2.12E-04	1.91E-04	1.58E-04
	Emission in each Box of 2nd jet	g/s	1.61E-04	1.25E-04	8.38E-05	6.34E-05	5.47E-05	7.63E-05	1.63E-04	4.29E-04	7.89E-04	7.38E-04	6.44E-04	5.99E-04	5.09E-04	4.56E-04	4.85E-04	5.22E-04	5.61E-04	6.24E-04	6.73E-04	6.21E-04	4.62E-04	3.70E-04	3.34E-04	2.76E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2082	0.1837	0.1859	0.1953	0.2016	0.3336	0.3467	0.3111	0.3379	0.3217	0.3062	0.2960	0.2988	0.3014	0.2965	0.3056	0.3095	0.3272	0.3370	0.3125	0.2893	0.2949	0.2839	0.2705
	NO2	g/vehicle/km	0.0410	0.0403	0.0405	0.0410	0.0420	0.0483	0.0484	0.0529	0.0656	0.0626	0.0594	0.0569	0.0509	0.0504	0.0500	0.0517	0.0528	0.0557	0.0582	0.0548	0.0493	0.0476	0.0455	0.0439
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0045***	***0.0032***	***0.0023***	***0.0018***	***0.0015***	***0.0030***	***0.0067***	***0.0149***	***0.0243***	***0.0224***	***0.0196***	***0.0181***	***0.0174***	***0.0164***	***0.0171***	***0.0185***	***0.0196***	***0.0223***	***0.0242***	***0.0216***	***0.0164***	***0.0138***	***0.0124***	***0.0103***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.01E-03	2.16E-03	1.50E-03	1.17E-03	1.01E-03	2.02E-03	4.46E-03	9.96E-03	1.62E-02	1.50E-02	1.30E-02	1.21E-02	1.16E-02	1.09E-02	1.14E-02	1.23E-02	1.31E-02	1.49E-02	1.62E-02	1.44E-02	1.10E-02	9.21E-03	8.28E-03	6.90E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.51E-03	1.08E-03	7.51E-04	5.85E-04	5.07E-04	1.01E-03	2.23E-03	4.98E-03	8.10E-03	7.48E-03	6.52E-03	6.03E-03	5.78E-03	5.46E-03	5.70E-03	6.16E-03	6.53E-03	7.43E-03	8.08E-03	7.18E-03	5.48E-03	4.61E-03	4.14E-03	3.45E-03
	Emission in each Box of 1st jet	g/s	4.30E-04	3.09E-04	2.15E-04	1.67E-04	1.45E-04	2.88E-04	6.37E-04	1.42E-03	2.31E-03	2.14E-03	1.86E-03	1.72E-03	1.65E-03	1.56E-03	1.63E-03	1.76E-03	1.87E-03	2.12E-03	2.31E-03	2.05E-03	1.57E-03	1.32E-03	1.18E-03	9.85E-04
	Emission in each Box of 2nd jet	g/s	7.53E-04	5.41E-04	3.76E-04	2.92E-04	2.54E-04	5.04E-04	1.11E-03	2.49E-03	4.05E-03	3.74E-03	3.26E-03	3.02E-03	2.89E-03	2.73E-03	2.85E-03	3.08E-03	3.26E-03	3.71E-03	4.04E-03	3.59E-03	2.74E-03	2.30E-03	2.07E-03	1.72E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0025***	***0.0047***	***0.0044***	***0.0038***	***0.0035***	***0.0030***	***0.0027***	***0.0029***	***0.0031***	***0.0033***	***0.0038***	***0.0042***	***0.0038***	***0.0028***	***0.0022***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.92E-04	4.75E-04	3.27E-04	2.46E-04	2.11E-04	2.92E-04	6.23E-04	1.69E-03	3.14E-03	2.91E-03	2.53E-03	2.32E-03	1.97E-03	1.83E-03	1.92E-03	2.08E-03	2.23E-03	2.53E-03	2.79E-03	2.52E-03	1.87E-03	1.49E-03	1.33E-03	1.12E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.96E-04	2.38E-04	1.64E-04	1.23E-04	1.06E-04	1.46E-04	3.11E-04	8.46E-04	1.57E-03	1.45E-03	1.26E-03	1.16E-03	9.85E-04	9.14E-04	9.61E-04	1.04E-03	1.11E-03	1.26E-03	1.40E-03	1.26E-03	9.35E-04	7.43E-04	6.63E-04	5.60E-04
	Emission in each Box of 1st jet	g/s	8.46E-05	6.79E-05	4.67E-05	3.51E-05	3.02E-05	4.18E-05	8.89E-05	2.42E-04	4.49E-04	4.16E-04	3.61E-04	3.31E-04	2.81E-04	2.61E-04	2.75E-04	2.98E-04	3.18E-04	3.61E-04	3.99E-04	3.60E-04	2.67E-04	2.12E-04	1.89E-04	1.60E-04
	Emission in each Box of 2nd jet	g/s	1.48E-04	1.19E-04	8.18E-05	6.14E-05	5.28E-05	7.31E-05	1.56E-04	4.23E-04	7.86E-04	7.27E-04	6.32E-04	5.80E-04	4.92E-04	4.57E-04	4.81E-04	5.21E-04	5.57E-04	6.32E-04	6.98E-04	6.30E-04	4.67E-04	3.71E-04	3.31E-04	2.80E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 086A01-086A09
Enclosure Involvec: 086P1
Road Located: 086
Vehicle EF Adopte: 086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2036	0.1774	0.1784	0.1871	0.1904	0.3252	0.3331	0.2971	0.3205	0.3218	0.3109	0.3103	0.3098	0.3062	0.3024	0.3141	0.3068	0.3229	0.3261	0.3003	0.2707	0.2761	0.2663	0.2465
	NO2	g/vehicle/km	0.0401	0.0390	0.0389	0.0394	0.0398	0.0472	0.0466	0.0506	0.0623	0.0626	0.0603	0.0595	0.0526	0.0512	0.0510	0.0531	0.0523	0.0550	0.0564	0.0528	0.0463	0.0447	0.0428	0.0402
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0044***	***0.0031***	***0.0022***	***0.0017***	***0.0014***	***0.0030***	***0.0064***	***0.0143***	***0.0231***	***0.0224***	***0.0199***	***0.0190***	***0.0180***	***0.0167***	***0.0174***	***0.0190***	***0.0194***	***0.0220***	***0.0234***	***0.0207***	***0.0154***	***0.0129***	***0.0116***	***0.0094***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.95E-03	2.09E-03	1.44E-03	1.12E-03	9.57E-04	1.97E-03	4.28E-03	9.51E-03	1.54E-02	1.50E-02	1.32E-02	1.26E-02	1.20E-02	1.11E-02	1.16E-02	1.27E-02	1.29E-02	1.47E-02	1.56E-02	1.38E-02	1.03E-02	8.62E-03	7.77E-03	6.29E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.47E-03	1.05E-03	7.21E-04	5.60E-04	4.79E-04	9.83E-04	2.14E-03	4.75E-03	7.68E-03	7.48E-03	6.62E-03	6.32E-03	6.00E-03	5.55E-03	5.81E-03	6.33E-03	6.47E-03	7.33E-03	7.81E-03	6.90E-03	5.13E-03	4.31E-03	3.88E-03	3.14E-03
	Emission in each Box of 1st jet	g/s	4.21E-04	2.99E-04	2.06E-04	1.60E-04	1.37E-04	2.81E-04	6.12E-04	1.36E-03	2.20E-03	2.14E-03	1.89E-03	1.81E-03	1.71E-03	1.59E-03	1.66E-03	1.81E-03	1.85E-03	2.09E-03	2.23E-03	1.97E-03	1.47E-03	1.23E-03	1.11E-03	8.98E-04
	Emission in each Box of 2nd jet	g/s	7.36E-04	5.23E-04	3.60E-04	2.80E-04	2.39E-04	4.92E-04	1.07E-03	2.38E-03	3.84E-03	3.74E-03	3.31E-03	3.16E-03	3.00E-03	2.78E-03	2.90E-03	3.17E-03	3.24E-03	3.67E-03	3.91E-03	3.45E-03	2.56E-03	2.16E-03	1.94E-03	1.57E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0045***	***0.0044***	***0.0039***	***0.0036***	***0.0031***	***0.0028***	***0.0029***	***0.0032***	***0.0033***	***0.0037***	***0.0041***	***0.0036***	***0.0026***	***0.0021***	***0.0019***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.80E-04	4.60E-04	3.14E-04	2.36E-04	2.00E-04	2.85E-04	5.99E-04	1.62E-03	2.99E-03	2.91E-03	2.57E-03	2.43E-03	2.04E-03	1.86E-03	1.96E-03	2.14E-03	2.21E-03	2.50E-03	2.70E-03	2.43E-03	1.75E-03	1.40E-03	1.25E-03	1.03E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.90E-04	2.30E-04	1.57E-04	1.18E-04	1.00E-04	1.43E-04	3.00E-04	8.09E-04	1.49E-03	1.45E-03	1.28E-03	1.21E-03	1.02E-03	9.28E-04	9.79E-04	1.07E-03	1.10E-03	1.25E-03	1.35E-03	1.21E-03	8.77E-04	6.98E-04	6.25E-04	5.13E-04
	Emission in each Box of 1st jet	g/s	8.29E-05	6.57E-05	4.49E-05	3.37E-05	2.86E-05	4.08E-05	8.56E-05	2.31E-04	4.27E-04	4.16E-04	3.67E-04	3.47E-04	2.91E-04	2.65E-04	2.80E-04	3.06E-04	3.15E-04	3.57E-04	3.86E-04	3.47E-04	2.51E-04	1.99E-04	1.78E-04	1.46E-04
	Emission in each Box of 2nd jet	g/s	1.45E-04	1.15E-04	7.86E-05	5.89E-05	5.00E-05	7.13E-05	1.50E-04	4.05E-04	7.47E-04	7.27E-04	6.42E-04	6.07E-04	5.09E-04	4.64E-04	4.90E-04	5.35E-04	5.52E-04	6.24E-04	6.75E-04	6.07E-04	4.38E-04	3.49E-04	3.12E-04	2.56E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2151	0.1822	0.1844	0.1969	0.2016	0.3323	0.3453	0.2957	0.3236	0.3155	0.3041	0.2972	0.3013	0.3057	0.3028	0.3100	0.3273	0.3380	0.3443	0.3177	0.2837	0.2803	0.2762	0.2592
	NO2	g/vehicle/km	0.0423	0.0400	0.0402	0.0413	0.0420	0.0481	0.0482	0.0504	0.0629	0.0614	0.0590	0.0571	0.0513	0.0511	0.0511	0.0524	0.0557	0.0575	0.0594	0.0556	0.0484	0.0453	0.0443	0.0422
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0047***	***0.0032***	***0.0022***	***0.0018***	***0.0015***	***0.0030***	***0.0067***	***0.0142***	***0.0233***	***0.0220***	***0.0194***	***0.0182***	***0.0175***	***0.0166***	***0.0175***	***0.0187***	***0.0207***	***0.0230***	***0.0248***	***0.0219***	***0.0161***	***0.0131***	***0.0121***	***0.0099***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.11E-03	2.15E-03	1.49E-03	1.18E-03	1.01E-03	2.01E-03	4.44E-03	9.46E-03	1.55E-02	1.47E-02	1.30E-02	1.21E-02	1.17E-02	1.11E-02	1.16E-02	1.25E-02	1.38E-02	1.53E-02	1.65E-02	1.46E-02	1.07E-02	8.76E-03	8.05E-03	6.61E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.56E-03	1.07E-03	7.45E-04	5.90E-04	5.07E-04	1.00E-03	2.22E-03	4.73E-03	7.76E-03	7.34E-03	6.48E-03	6.06E-03	5.83E-03	5.54E-03	5.82E-03	6.25E-03	6.91E-03	7.67E-03	8.25E-03	7.30E-03	5.37E-03	4.38E-03	4.03E-03	3.31E-03
	Emission in each Box of 1st jet	g/s	4.44E-04	3.07E-04	2.13E-04	1.68E-04	1.45E-04	2.87E-04	6.34E-04	1.35E-03	2.22E-03	2.10E-03	1.85E-03	1.73E-03	1.67E-03	1.58E-03	1.66E-03	1.79E-03	1.97E-03	2.19E-03	2.36E-03	2.09E-03	1.54E-03	1.25E-03	1.15E-03	9.44E-04
	Emission in each Box of 2nd jet	g/s	7.78E-04	5.37E-04	3.73E-04	2.95E-04	2.54E-04	5.02E-04	1.11E-03	2.37E-03	3.88E-03	3.67E-03	3.24E-03	3.03E-03	2.92E-03	2.77E-03	2.91E-03	3.12E-03	3.45E-03	3.84E-03	4.13E-03	3.65E-03	2.69E-03	2.19E-03	2.01E-03	1.65E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0045***	***0.0043***	***0.0038***	***0.0035***	***0.0030***	***0.0028***	***0.0029***	***0.0032***	***0.0035***	***0.0039***	***0.0043***	***0.0038***	***0.0028***	***0.0021***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.11E-04	4.71E-04	3.25E-04	2.47E-04	2.11E-04	2.91E-04	6.20E-04	1.61E-03	3.01E-03	2.86E-03	2.51E-03	2.33E-03	1.99E-03	1.85E-03	1.96E-03	2.11E-03	2.35E-03	2.61E-03	2.85E-03	2.56E-03	1.83E-03	1.42E-03	1.29E-03	1.08E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.06E-04	2.36E-04	1.62E-04	1.24E-04	1.06E-04	1.46E-04	3.10E-04	8.06E-04	1.51E-03	1.43E-03	1.26E-03	1.16E-03	9.93E-04	9.27E-04	9.81E-04	1.06E-03	1.17E-03	1.31E-03	1.42E-03	1.28E-03	9.17E-04	7.08E-04	6.46E-04	5.38E-04
	Emission in each Box of 1st jet	g/s	8.73E-05	6.73E-05	4.64E-05	3.53E-05	3.02E-05	4.16E-05	8.86E-05	2.30E-04	4.31E-04	4.08E-04	3.59E-04	3.33E-04	2.84E-04	2.65E-04	2.80E-04	3.02E-04	3.36E-04	3.73E-04	4.07E-04	3.65E-04	2.62E-04	2.02E-04	1.85E-04	1.54E-04
	Emission in each Box of 2nd jet	g/s	1.53E-04	1.18E-04	8.12E-05	6.18E-05	5.28E-05	7.28E-05	1.55E-04	4.03E-04	7.54E-04	7.14E-04	6.28E-04	5.82E-04	4.96E-04	4.63E-04	4.90E-04	5.28E-04	5.87E-04	6.53E-04	7.12E-04	6.40E-04	4.59E-04	3.54E-04	3.23E-04	2.69E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2136	0.1861	0.1819	0.1889	0.2006	0.3237	0.3378	0.2909	0.3100	0.3017	0.3016	0.2840	0.2963	0.2971	0.3007	0.2940	0.2947	0.3201	0.3290	0.3034	0.2833	0.2830	0.2754	0.2563
	NO2	g/vehicle/km	0.0420	0.0408	0.0396	0.0397	0.0418	0.0470	0.0472	0.0496	0.0603	0.0588	0.0585	0.0547	0.0504	0.0497	0.0507	0.0498	0.0504	0.0546	0.0568	0.0533	0.0484	0.0457	0.0442	0.0418
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0046***	***0.0033***	***0.0022***	***0.0017***	***0.0015***	***0.0029***	***0.0065***	***0.0140***	***0.0223***	***0.0210***	***0.0193***	***0.0174***	***0.0172***	***0.0162***	***0.0173***	***0.0178***	***0.0187***	***0.0218***	***0.0237***	***0.0209***	***0.0161***	***0.0133***	***0.0120***	***0.0098***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.09E-03	2.19E-03	1.47E-03	1.13E-03	1.01E-03	1.96E-03	4.34E-03	9.31E-03	1.49E-02	1.40E-02	1.28E-02	1.16E-02	1.15E-02	1.08E-02	1.16E-02	1.19E-02	1.24E-02	1.45E-02	1.58E-02	1.39E-02	1.07E-02	8.84E-03	8.03E-03	6.54E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.54E-03	1.10E-03	7.35E-04	5.66E-04	5.04E-04	9.79E-04	2.17E-03	4.65E-03	7.43E-03	7.01E-03	6.42E-03	5.79E-03	5.73E-03	5.39E-03	5.78E-03	5.93E-03	6.22E-03	7.27E-03	7.88E-03	6.97E-03	5.37E-03	4.42E-03	4.02E-03	3.27E-03
	Emission in each Box of 1st jet	g/s	4.41E-04	3.13E-04	2.10E-04	1.62E-04	1.44E-04	2.80E-04	6.21E-04	1.33E-03	2.12E-03	2.00E-03	1.83E-03	1.65E-03	1.64E-03	1.54E-03	1.65E-03	1.69E-03	1.78E-03	2.08E-03	2.25E-03	1.99E-03	1.53E-03	1.26E-03	1.15E-03	9.34E-04
	Emission in each Box of 2nd jet	g/s	7.72E-04	5.48E-04	3.68E-04	2.83E-04	2.52E-04	4.89E-04	1.09E-03	2.33E-03	3.72E-03	3.51E-03	3.21E-03	2.89E-03	2.87E-03	2.69E-03	2.89E-03	2.96E-03	3.11E-03	3.63E-03	3.94E-03	3.49E-03	2.68E-03	2.21E-03	2.01E-03	1.63E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0043***	***0.0041***	***0.0037***	***0.0033***	***0.0029***	***0.0027***	***0.0029***	***0.0030***	***0.0032***	***0.0037***	***0.0041***	***0.0037***	***0.0027***	***0.0021***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.07E-04	4.81E-04	3.20E-04	2.38E-04	2.10E-04	2.84E-04	6.07E-04	1.59E-03	2.89E-03	2.74E-03	2.49E-03	2.23E-03	1.95E-03	1.80E-03	1.95E-03	2.01E-03	2.13E-03	2.48E-03	2.72E-03	2.45E-03	1.83E-03	1.43E-03	1.29E-03	1.07E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.04E-04	2.41E-04	1.60E-04	1.19E-04	1.05E-04	1.42E-04	3.04E-04	7.93E-04	1.45E-03	1.37E-03	1.25E-03	1.11E-03	9.76E-04	9.02E-04	9.74E-04	1.00E-03	1.06E-03	1.24E-03	1.36E-03	1.23E-03	9.16E-04	7.14E-04	6.45E-04	5.33E-04
	Emission in each Box of 1st jet	g/s	8.68E-05	6.87E-05	4.58E-05	3.40E-05	3.00E-05	4.06E-05	8.68E-05	2.27E-04	4.13E-04	3.91E-04	3.56E-04	3.18E-04	2.79E-04	2.58E-04	2.78E-04	2.87E-04	3.04E-04	3.54E-04	3.89E-04	3.50E-04	2.62E-04	2.04E-04	1.84E-04	1.52E-04
	Emission in each Box of 2nd jet	g/s	1.52E-04	1.20E-04	8.01E-05	5.94E-05	5.25E-05	7.10E-05	1.52E-04	3.97E-04	7.23E-04	6.84E-04	6.23E-04	5.57E-04	4.88E-04	4.51E-04	4.87E-04	5.02E-04	5.31E-04	6.19E-04	6.81E-04	6.13E-04	4.58E-04	3.57E-04	3.22E-04	2.66E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2428	0.2140	0.2106	0.2223	0.2311	0.3893	0.4025	0.3467	0.3681	0.3543	0.3366	0.3319	0.3382	0.3318	0.3241	0.3381	0.3399	0.3591	0.3687	0.3429	0.3185	0.3180	0.3124	0.2960
	NO2	g/vehicle/km	0.0472	0.0463	0.0453	0.0461	0.0474	0.0558	0.0557	0.0585	0.0709	0.0685	0.0650	0.0634	0.0572	0.0551	0.0544	0.0568	0.0576	0.0608	0.0633	0.0598	0.0539	0.0510	0.0497	0.0478
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0053***	***0.0038***	***0.0026***	***0.0020***	***0.0017***	***0.0035***	***0.0078***	***0.0166***	***0.0265***	***0.0247***	***0.0215***	***0.0203***	***0.0196***	***0.0181***	***0.0187***	***0.0204***	***0.0215***	***0.0245***	***0.0265***	***0.0236***	***0.0181***	***0.0149***	***0.0137***	***0.0113***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.51E-03	2.52E-03	1.70E-03	1.33E-03	1.16E-03	2.35E-03	5.18E-03	1.11E-02	1.76E-02	1.65E-02	1.43E-02	1.35E-02	1.31E-02	1.20E-02	1.24E-02	1.36E-02	1.43E-02	1.63E-02	1.77E-02	1.58E-02	1.21E-02	9.93E-03	9.11E-03	7.55E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.76E-03	1.26E-03	8.51E-04	6.66E-04	5.81E-04	1.18E-03	2.59E-03	5.55E-03	8.82E-03	8.24E-03	7.17E-03	6.77E-03	6.55E-03	6.02E-03	6.22E-03	6.81E-03	7.17E-03	8.15E-03	8.84E-03	7.88E-03	6.03E-03	4.97E-03	4.56E-03	3.77E-03
	Emission in each Box of 1st jet	g/s	5.02E-04	3.60E-04	2.43E-04	1.90E-04	1.66E-04	3.36E-04	7.39E-04	1.58E-03	2.52E-03	2.35E-03	2.05E-03	1.93E-03	1.87E-03	1.72E-03	1.78E-03	1.95E-03	2.05E-03	2.33E-03	2.52E-03	2.25E-03	1.72E-03	1.42E-03	1.30E-03	1.08E-03
	Emission in each Box of 2nd jet	g/s	8.78E-04	6.30E-04	4.26E-04	3.33E-04	2.91E-04	5.89E-04	1.29E-03	2.77E-03	4.41E-03	4.12E-03	3.58E-03	3.38E-03	3.27E-03	3.01E-03	3.11E-03	3.41E-03	3.59E-03	4.08E-03	4.42E-03	3.94E-03	3.02E-03	2.48E-03	2.28E-03	1.89E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0028***	***0.0051***	***0.0048***	***0.0042***	***0.0039***	***0.0033***	***0.0030***	***0.0031***	***0.0034***	***0.0036***	***0.0041***	***0.0045***	***0.0041***	***0.0031***	***0.0024***	***0.0022***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.83E-04	5.46E-04	3.66E-04	2.76E-04	2.39E-04	3.38E-04	7.16E-04	1.87E-03	3.40E-03	3.18E-03	2.77E-03	2.58E-03	2.21E-03	2.00E-03	2.09E-03	2.29E-03	2.43E-03	2.76E-03	3.03E-03	2.75E-03	2.04E-03	1.59E-03	1.45E-03	1.22E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.42E-04	2.73E-04	1.83E-04	1.38E-04	1.19E-04	1.69E-04	3.58E-04	9.36E-04	1.70E-03	1.59E-03	1.38E-03	1.29E-03	1.11E-03	1.00E-03	1.04E-03	1.15E-03	1.22E-03	1.38E-03	1.52E-03	1.37E-03	1.02E-03	7.97E-04	7.25E-04	6.09E-04
	Emission in each Box of 1st jet	g/s	9.76E-05	7.80E-05	5.23E-05	3.94E-05	3.41E-05	4.82E-05	1.02E-04	2.67E-04	4.86E-04	4.55E-04	3.95E-04	3.69E-04	3.16E-04	2.86E-04	2.98E-04	3.27E-04	3.47E-04	3.94E-04	4.33E-04	3.92E-04	2.92E-04	2.28E-04	2.07E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	1.71E-04	1.36E-04	9.15E-05	6.90E-05	5.97E-05	8.44E-05	1.79E-04	4.68E-04	8.50E-04	7.96E-04	6.92E-04	6.46E-04	5.53E-04	5.00E-04	5.22E-04	5.73E-04	6.08E-04	6.90E-04	7.58E-04	6.87E-04	5.10E-04	3.98E-04	3.62E-04	3.04E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2651	0.2294	0.2289	0.2429	0.2520	0.4210	0.4396	0.3748	0.3975	0.3814	0.3636	0.3534	0.3624	0.3588	0.3521	0.3613	0.3643	0.3826	0.3928	0.3717	0.3411	0.3470	0.3390	0.3194
	NO2	g/vehicle/km	0.0512	0.0494	0.0488	0.0499	0.0514	0.0601	0.0606	0.0629	0.0762	0.0734	0.0697	0.0670	0.0608	0.0592	0.0587	0.0604	0.0614	0.0644	0.0671	0.0644	0.0574	0.0552	0.0536	0.0512
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0058***	***0.0041***	***0.0028***	***0.0022***	***0.0019***	***0.0038***	***0.0085***	***0.0180***	***0.0286***	***0.0266***	***0.0232***	***0.0216***	***0.0210***	***0.0195***	***0.0203***	***0.0219***	***0.0231***	***0.0261***	***0.0282***	***0.0256***	***0.0194***	***0.0163***	***0.0148***	***0.0122***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.83E-03	2.70E-03	1.85E-03	1.45E-03	1.27E-03	2.55E-03	5.65E-03	1.20E-02	1.91E-02	1.77E-02	1.55E-02	1.44E-02	1.40E-02	1.30E-02	1.35E-02	1.46E-02	1.54E-02	1.74E-02	1.88E-02	1.71E-02	1.29E-02	1.08E-02	9.89E-03	8.14E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.92E-03	1.35E-03	9.25E-04	7.27E-04	6.34E-04	1.27E-03	2.83E-03	6.00E-03	9.53E-03	8.87E-03	7.74E-03	7.20E-03	7.02E-03	6.51E-03	6.76E-03	7.28E-03	7.69E-03	8.69E-03	9.41E-03	8.54E-03	6.46E-03	5.42E-03	4.94E-03	4.07E-03
	Emission in each Box of 1st jet	g/s	5.48E-04	3.86E-04	2.64E-04	2.08E-04	1.81E-04	3.64E-04	8.07E-04	1.71E-03	2.72E-03	2.53E-03	2.21E-03	2.06E-03	2.00E-03	1.86E-03	1.93E-03	2.08E-03	2.20E-03	2.48E-03	2.69E-03	2.44E-03	1.85E-03	1.55E-03	1.41E-03	1.16E-03
	Emission in each Box of 2nd jet	g/s	9.59E-04	6.76E-04	4.63E-04	3.64E-04	3.17E-04	6.37E-04	1.41E-03	3.00E-03	4.77E-03	4.43E-03	3.87E-03	3.60E-03	3.51E-03	3.25E-03	3.38E-03	3.64E-03	3.84E-03	4.34E-03	4.71E-03	4.27E-03	3.23E-03	2.71E-03	2.47E-03	2.04E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0012***	***0.0030***	***0.0055***	***0.0051***	***0.0045***	***0.0041***	***0.0035***	***0.0032***	***0.0034***	***0.0037***	***0.0039***	***0.0044***	***0.0048***	***0.0044***	***0.0033***	***0.0026***	***0.0023***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.41E-04	5.82E-04	3.94E-04	2.99E-04	2.58E-04	3.64E-04	7.79E-04	2.01E-03	3.65E-03	3.41E-03	2.97E-03	2.73E-03	2.35E-03	2.15E-03	2.25E-03	2.43E-03	2.59E-03	2.93E-03	3.21E-03	2.96E-03	2.18E-03	1.73E-03	1.56E-03	1.31E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.71E-04	2.91E-04	1.97E-04	1.49E-04	1.29E-04	1.82E-04	3.89E-04	1.01E-03	1.83E-03	1.71E-03	1.48E-03	1.37E-03	1.18E-03	1.07E-03	1.13E-03	1.22E-03	1.30E-03	1.46E-03	1.61E-03	1.48E-03	1.09E-03	8.63E-04	7.82E-04	6.53E-04
	Emission in each Box of 1st jet	g/s	1.06E-04	8.32E-05	5.64E-05	4.27E-05	3.69E-05	5.19E-05	1.11E-04	2.88E-04	5.22E-04	4.87E-04	4.24E-04	3.90E-04	3.36E-04	3.07E-04	3.22E-04	3.48E-04	3.70E-04	4.18E-04	4.59E-04	4.23E-04	3.11E-04	2.46E-04	2.23E-04	1.87E-04
	Emission in each Box of 2nd jet	g/s	1.85E-04	1.46E-04	9.86E-05	7.47E-05	6.46E-05	9.09E-05	1.95E-04	5.04E-04	9.13E-04	8.53E-04	7.42E-04	6.83E-04	5.88E-04	5.37E-04	5.64E-04	6.09E-04	6.48E-04	7.31E-04	8.04E-04	7.40E-04	5.44E-04	4.31E-04	3.91E-04	3.26E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2751	0.2394	0.2389	0.2539	0.2622	0.4338	0.4529	0.3881	0.4090	0.3920	0.3736	0.3658	0.3734	0.3678	0.3613	0.3717	0.3771	0.3999	0.4056	0.3835	0.3527	0.3585	0.3508	0.3318
	NO2	g/vehicle/km	0.0528	0.0510	0.0504	0.0516	0.0529	0.0616	0.0620	0.0648	0.0779	0.0750	0.0712	0.0690	0.0623	0.0604	0.0599	0.0618	0.0632	0.0669	0.0689	0.0660	0.0590	0.0567	0.0551	0.0529
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0060***	***0.0042***	***0.0029***	***0.0023***	***0.0020***	***0.0039***	***0.0087***	***0.0186***	***0.0294***	***0.0273***	***0.0239***	***0.0224***	***0.0217***	***0.0200***	***0.0208***	***0.0225***	***0.0239***	***0.0272***	***0.0292***	***0.0264***	***0.0200***	***0.0168***	***0.0153***	***0.0127***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.98E-03	2.82E-03	1.93E-03	1.52E-03	1.32E-03	2.62E-03	5.82E-03	1.24E-02	1.96E-02	1.82E-02	1.59E-02	1.49E-02	1.45E-02	1.33E-02	1.39E-02	1.50E-02	1.59E-02	1.82E-02	1.94E-02	1.76E-02	1.34E-02	1.12E-02	1.02E-02	8.46E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.99E-03	1.41E-03	9.66E-04	7.60E-04	6.59E-04	1.31E-03	2.91E-03	6.21E-03	9.81E-03	9.12E-03	7.96E-03	7.46E-03	7.23E-03	6.67E-03	6.94E-03	7.49E-03	7.96E-03	9.08E-03	9.72E-03	8.81E-03	6.68E-03	5.60E-03	5.11E-03	4.23E-03
	Emission in each Box of 1st jet	g/s	5.68E-04	4.03E-04	2.76E-04	2.17E-04	1.88E-04	3.75E-04	8.32E-04	1.77E-03	2.80E-03	2.60E-03	2.27E-03	2.13E-03	2.07E-03	1.91E-03	1.98E-03	2.14E-03	2.27E-03	2.59E-03	2.78E-03	2.52E-03	1.91E-03	1.60E-03	1.46E-03	1.21E-03
	Emission in each Box of 2nd jet	g/s	9.95E-04	7.05E-04	4.83E-04	3.80E-04	3.30E-04	6.56E-04	1.46E-03	3.10E-03	4.90E-03	4.56E-03	3.98E-03	3.73E-03	3.61E-03	3.33E-03	3.47E-03	3.75E-03	3.98E-03	4.54E-03	4.86E-03	4.41E-03	3.34E-03	2.80E-03	2.56E-03	2.12E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0031***	***0.0056***	***0.0052***	***0.0046***	***0.0042***	***0.0036***	***0.0033***	***0.0035***	***0.0037***	***0.0040***	***0.0046***	***0.0050***	***0.0046***	***0.0034***	***0.0027***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.64E-04	6.01E-04	4.07E-04	3.09E-04	2.66E-04	3.72E-04	7.97E-04	2.07E-03	3.74E-03	3.49E-03	3.03E-03	2.81E-03	2.41E-03	2.19E-03	2.30E-03	2.49E-03	2.67E-03	3.04E-03	3.30E-03	3.03E-03	2.24E-03	1.77E-03	1.61E-03	1.35E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.82E-04	3.01E-04	2.04E-04	1.55E-04	1.33E-04	1.86E-04	3.99E-04	1.04E-03	1.87E-03	1.74E-03	1.52E-03	1.41E-03	1.21E-03	1.10E-03	1.15E-03	1.25E-03	1.33E-03	1.52E-03	1.65E-03	1.52E-03	1.12E-03	8.86E-04	8.04E-04	6.74E-04
	Emission in each Box of 1st jet	g/s	1.09E-04	8.59E-05	5.82E-05	4.42E-05	3.80E-05	5.32E-05	1.14E-04	2.96E-04	5.34E-04	4.98E-04	4.33E-04	4.02E-04	3.44E-04	3.13E-04	3.29E-04	3.56E-04	3.81E-04	4.34E-04	4.72E-04	4.34E-04	3.19E-04	2.53E-04	2.30E-04	1.93E-04
	Emission in each Box of 2nd jet	g/s	1.91E-04	1.50E-04	1.02E-04	7.73E-05	6.65E-05	9.31E-05	1.99E-04	5.18E-04	9.34E-04	8.72E-04	7.59E-04	7.03E-04	6.03E-04	5.48E-04	5.75E-04	6.23E-04	6.67E-04	7.59E-04	8.25E-04	7.59E-04	5.59E-04	4.43E-04	4.02E-04	3.37E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2780	0.2437	0.2423	0.2580	0.2659	0.4390	0.4573	0.3937	0.4137	0.3963	0.3758	0.3703	0.3769	0.3729	0.3666	0.3772	0.3868	0.4084	0.4145	0.3905	0.3604	0.3662	0.3547	0.3333
	NO2	g/vehicle/km	0.0532	0.0517	0.0510	0.0522	0.0534	0.0622	0.0625	0.0655	0.0787	0.0756	0.0715	0.0697	0.0627	0.0610	0.0605	0.0624	0.0645	0.0681	0.0702	0.0670	0.0601	0.0577	0.0556	0.0530
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0131***	***0.0093***	***0.0064***	***0.0050***	***0.0043***	***0.0086***	***0.0191***	***0.0409***	***0.0644***	***0.0598***	***0.0520***	***0.0490***	***0.0474***	***0.0439***	***0.0457***	***0.0494***	***0.0530***	***0.0602***	***0.0645***	***0.0583***	***0.0443***	***0.0371***	***0.0336***	***0.0276***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.71E-03	6.22E-03	4.24E-03	3.35E-03	2.90E-03	5.75E-03	1.27E-02	2.73E-02	4.29E-02	3.99E-02	3.47E-02	3.27E-02	3.16E-02	2.93E-02	3.05E-02	3.29E-02	3.53E-02	4.01E-02	4.30E-02	3.89E-02	2.96E-02	2.48E-02	2.24E-02	1.84E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.35E-03	3.11E-03	2.12E-03	1.67E-03	1.45E-03	2.87E-03	6.37E-03	1.36E-02	2.15E-02	1.99E-02	1.73E-02	1.63E-02	1.58E-02	1.46E-02	1.52E-02	1.65E-02	1.77E-02	2.01E-02	2.15E-02	1.94E-02	1.48E-02	1.24E-02	1.12E-02	9.20E-03
	Emission in each Box of 1st jet	g/s	1.09E-03	7.77E-04	5.30E-04	4.18E-04	3.62E-04	7.18E-04	1.59E-03	3.41E-03	5.37E-03	4.99E-03	4.33E-03	4.09E-03	3.95E-03	3.66E-03	3.81E-03	4.12E-03	4.42E-03	5.02E-03	5.38E-03	4.86E-03	3.70E-03	3.10E-03	2.80E-03	2.30E-03
	Emission in each Box of 2nd jet	g/s	6.22E-04	4.44E-04	3.03E-04	2.39E-04	2.07E-04	4.11E-04	9.09E-04	1.95E-03	3.07E-03	2.85E-03	2.48E-03	2.33E-03	2.26E-03	2.09E-03	2.18E-03	2.35E-03	2.52E-03	2.87E-03	3.07E-03	2.78E-03	2.11E-03	1.77E-03	1.60E-03	1.31E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0020***	***0.0013***	***0.0010***	***0.0009***	***0.0012***	***0.0026***	***0.0068***	***0.0123***	***0.0114***	***0.0099***	***0.0092***	***0.0079***	***0.0072***	***0.0076***	***0.0082***	***0.0088***	***0.0100***	***0.0109***	***0.0100***	***0.0074***	***0.0059***	***0.0053***	***0.0044***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.67E-03	1.32E-03	8.92E-04	6.77E-04	5.82E-04	8.14E-04	1.74E-03	4.54E-03	8.17E-03	7.61E-03	6.59E-03	6.15E-03	5.25E-03	4.79E-03	5.03E-03	5.45E-03	5.89E-03	6.69E-03	7.28E-03	6.67E-03	4.93E-03	3.90E-03	3.51E-03	2.93E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.33E-04	6.60E-04	4.46E-04	3.39E-04	2.91E-04	4.07E-04	8.70E-04	2.27E-03	4.08E-03	3.80E-03	3.30E-03	3.08E-03	2.63E-03	2.40E-03	2.52E-03	2.72E-03	2.95E-03	3.35E-03	3.64E-03	3.33E-03	2.46E-03	1.95E-03	1.75E-03	1.46E-03
	Emission in each Box of 1st jet	g/s	2.08E-04	1.65E-04	1.11E-04	8.47E-05	7.27E-05	1.02E-04	2.18E-04	5.68E-04	1.02E-03	9.51E-04	8.24E-04	7.69E-04	6.57E-04	5.99E-04	6.29E-04	6.81E-04	7.37E-04	8.36E-04	9.10E-04	8.33E-04	6.16E-04	4.88E-04	4.39E-04	3.66E-04
	Emission in each Box of 2nd jet	g/s	1.19E-04	9.43E-05	6.37E-05	4.84E-05	4.16E-05	5.82E-05	1.24E-04	3.24E-04	5.83E-04	5.44E-04	4.71E-04	4.39E-04	3.75E-04	3.42E-04	3.60E-04	3.89E-04	4.21E-04	4.78E-04	5.20E-04	4.76E-04	3.52E-04	2.79E-04	2.51E-04	2.09E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2545	0.2224	0.2201	0.2356	0.2496	0.4167	0.4360	0.3722	0.3920	0.3800	0.3616	0.3545	0.3592	0.3511	0.3474	0.3586	0.3675	0.3835	0.3801	0.3575	0.3283	0.3345	0.3243	0.3043
	NO2	g/vehicle/km	0.0493	0.0478	0.0469	0.0484	0.0509	0.0595	0.0600	0.0625	0.0752	0.0730	0.0692	0.0672	0.0602	0.0580	0.0579	0.0599	0.0618	0.0644	0.0650	0.0620	0.0553	0.0533	0.0514	0.0489
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0120***	***0.0085***	***0.0058***	***0.0046***	***0.0041***	***0.0082***	***0.0182***	***0.0387***	***0.0610***	***0.0574***	***0.0500***	***0.0469***	***0.0452***	***0.0413***	***0.0433***	***0.0469***	***0.0504***	***0.0565***	***0.0592***	***0.0534***	***0.0404***	***0.0339***	***0.0307***	***0.0252***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.97E-03	5.67E-03	3.85E-03	3.05E-03	2.72E-03	5.46E-03	1.21E-02	2.58E-02	4.07E-02	3.83E-02	3.33E-02	3.13E-02	3.01E-02	2.76E-02	2.89E-02	3.13E-02	3.36E-02	3.77E-02	3.94E-02	3.56E-02	2.69E-02	2.26E-02	2.05E-02	1.68E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.98E-03	2.84E-03	1.93E-03	1.53E-03	1.36E-03	2.73E-03	6.07E-03	1.29E-02	2.03E-02	1.91E-02	1.67E-02	1.56E-02	1.51E-02	1.38E-02	1.44E-02	1.56E-02	1.68E-02	1.88E-02	1.97E-02	1.78E-02	1.35E-02	1.13E-02	1.02E-02	8.40E-03
	Emission in each Box of 1st jet	g/s	9.96E-04	7.09E-04	4.81E-04	3.82E-04	3.40E-04	6.82E-04	1.52E-03	3.22E-03	5.09E-03	4.78E-03	4.17E-03	3.91E-03	3.76E-03	3.45E-03	3.61E-03	3.91E-03	4.20E-03	4.71E-03	4.93E-03	4.45E-03	3.37E-03	2.83E-03	2.56E-03	2.10E-03
	Emission in each Box of 2nd jet	g/s	5.69E-04	4.05E-04	2.75E-04	2.18E-04	1.94E-04	3.90E-04	8.67E-04	1.84E-03	2.91E-03	2.73E-03	2.38E-03	2.24E-03	2.15E-03	1.97E-03	2.06E-03	2.24E-03	2.40E-03	2.69E-03	2.82E-03	2.54E-03	1.92E-03	1.62E-03	1.46E-03	1.20E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0025***	***0.0065***	***0.0117***	***0.0110***	***0.0096***	***0.0089***	***0.0076***	***0.0068***	***0.0072***	***0.0078***	***0.0085***	***0.0095***	***0.0101***	***0.0093***	***0.0068***	***0.0054***	***0.0049***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-03	1.22E-03	8.22E-04	6.28E-04	5.54E-04	7.79E-04	1.67E-03	4.33E-03	7.81E-03	7.35E-03	6.38E-03	5.93E-03	5.05E-03	4.56E-03	4.81E-03	5.23E-03	5.64E-03	6.34E-03	6.74E-03	6.17E-03	4.54E-03	3.61E-03	3.24E-03	2.70E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.72E-04	6.10E-04	4.11E-04	3.14E-04	2.77E-04	3.90E-04	8.35E-04	2.16E-03	3.90E-03	3.68E-03	3.19E-03	2.96E-03	2.52E-03	2.28E-03	2.41E-03	2.61E-03	2.82E-03	3.17E-03	3.37E-03	3.09E-03	2.27E-03	1.80E-03	1.62E-03	1.35E-03
	Emission in each Box of 1st jet	g/s	1.93E-04	1.53E-04	1.03E-04	7.85E-05	6.92E-05	9.74E-05	2.09E-04	5.41E-04	9.76E-04	9.19E-04	7.98E-04	7.41E-04	6.31E-04	5.69E-04	6.02E-04	6.53E-04	7.05E-04	7.92E-04	8.43E-04	7.72E-04	5.67E-04	4.51E-04	4.05E-04	3.37E-04
	Emission in each Box of 2nd jet	g/s	1.10E-04	8.71E-05	5.87E-05	4.48E-05	3.96E-05	5.56E-05	1.19E-04	3.09E-04	5.58E-04	5.25E-04	4.56E-04	4.24E-04	3.60E-04	3.25E-04	3.44E-04	3.73E-04	4.03E-04	4.53E-04	4.82E-04	4.41E-04	3.24E-04	2.58E-04	2.32E-04	1.93E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2569	0.2222	0.2203	0.2362	0.2452	0.4068	0.4225	0.3667	0.3850	0.3693	0.3434	0.3376	0.3412	0.3380	0.3318	0.3427	0.3530	0.3721	0.3782	0.3579	0.3325	0.3354	0.3304	0.3113
	NO2	g/vehicle/km	0.0498	0.0479	0.0471	0.0486	0.0500	0.0581	0.0583	0.0616	0.0739	0.0711	0.0660	0.0643	0.0576	0.0561	0.0556	0.0575	0.0596	0.0628	0.0647	0.0622	0.0560	0.0536	0.0523	0.0500
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0121***	***0.0085***	***0.0058***	***0.0046***	***0.0040***	***0.0080***	***0.0176***	***0.0381***	***0.0599***	***0.0558***	***0.0475***	***0.0447***	***0.0429***	***0.0398***	***0.0414***	***0.0449***	***0.0484***	***0.0549***	***0.0589***	***0.0534***	***0.0409***	***0.0340***	***0.0313***	***0.0258***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.04E-03	5.67E-03	3.86E-03	3.06E-03	2.67E-03	5.33E-03	1.18E-02	2.54E-02	4.00E-02	3.72E-02	3.17E-02	2.98E-02	2.86E-02	2.65E-02	2.76E-02	2.99E-02	3.22E-02	3.66E-02	3.92E-02	3.56E-02	2.73E-02	2.27E-02	2.09E-02	1.72E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.02E-03	2.83E-03	1.93E-03	1.53E-03	1.33E-03	2.66E-03	5.88E-03	1.27E-02	2.00E-02	1.86E-02	1.58E-02	1.49E-02	1.43E-02	1.33E-02	1.38E-02	1.50E-02	1.61E-02	1.83E-02	1.96E-02	1.78E-02	1.36E-02	1.13E-02	1.04E-02	8.59E-03
	Emission in each Box of 1st jet	g/s	1.01E-03	7.09E-04	4.82E-04	3.83E-04	3.34E-04	6.66E-04	1.47E-03	3.18E-03	5.00E-03	4.65E-03	3.96E-03	3.72E-03	3.57E-03	3.32E-03	3.45E-03	3.74E-03	4.03E-03	4.57E-03	4.91E-03	4.45E-03	3.41E-03	2.84E-03	2.61E-03	2.15E-03
	Emission in each Box of 2nd jet	g/s	5.75E-04	4.05E-04	2.75E-04	2.19E-04	1.91E-04	3.80E-04	8.40E-04	1.81E-03	2.85E-03	2.66E-03	2.26E-03	2.13E-03	2.04E-03	1.90E-03	1.97E-03	2.14E-03	2.30E-03	2.61E-03	2.80E-03	2.54E-03	1.95E-03	1.62E-03	1.49E-03	1.23E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0024***	***0.0064***	***0.0115***	***0.0107***	***0.0091***	***0.0085***	***0.0072***	***0.0066***	***0.0069***	***0.0075***	***0.0082***	***0.0093***	***0.0101***	***0.0093***	***0.0069***	***0.0054***	***0.0050***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.56E-03	1.22E-03	8.24E-04	6.30E-04	5.45E-04	7.61E-04	1.62E-03	4.27E-03	7.67E-03	7.16E-03	6.09E-03	5.67E-03	4.83E-03	4.41E-03	4.62E-03	5.02E-03	5.44E-03	6.17E-03	6.72E-03	6.19E-03	4.60E-03	3.62E-03	3.30E-03	2.76E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.79E-04	6.11E-04	4.12E-04	3.15E-04	2.72E-04	3.81E-04	8.11E-04	2.13E-03	3.84E-03	3.58E-03	3.04E-03	2.84E-03	2.41E-03	2.20E-03	2.31E-03	2.51E-03	2.72E-03	3.08E-03	3.36E-03	3.09E-03	2.30E-03	1.81E-03	1.65E-03	1.38E-03
	Emission in each Box of 1st jet	g/s	1.95E-04	1.53E-04	1.03E-04	7.87E-05	6.81E-05	9.52E-05	2.03E-04	5.33E-04	9.59E-04	8.95E-04	7.61E-04	7.09E-04	6.03E-04	5.51E-04	5.78E-04	6.28E-04	6.81E-04	7.71E-04	8.39E-04	7.73E-04	5.74E-04	4.53E-04	4.13E-04	3.45E-04
	Emission in each Box of 2nd jet	g/s	1.11E-04	8.73E-05	5.89E-05	4.50E-05	3.89E-05	5.44E-05	1.16E-04	3.05E-04	5.48E-04	5.11E-04	4.35E-04	4.05E-04	3.45E-04	3.15E-04	3.30E-04	3.59E-04	3.89E-04	4.41E-04	4.80E-04	4.42E-04	3.28E-04	2.59E-04	2.36E-04	1.97E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2367	0.2073	0.2075	0.2224	0.2311	0.3871	0.4084	0.3665	0.3831	0.3691	0.3483	0.3385	0.3370	0.3348	0.3250	0.3358	0.3471	0.3610	0.3618	0.3381	0.3111	0.3133	0.3024	0.2791
	NO2	g/vehicle/km	0.0463	0.0451	0.0447	0.0461	0.0475	0.0556	0.0565	0.0617	0.0738	0.0712	0.0671	0.0646	0.0569	0.0556	0.0545	0.0565	0.0588	0.0611	0.0622	0.0590	0.0528	0.0503	0.0482	0.0453
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0111***	***0.0079***	***0.0054***	***0.0043***	***0.0038***	***0.0076***	***0.0171***	***0.0381***	***0.0597***	***0.0557***	***0.0482***	***0.0448***	***0.0424***	***0.0394***	***0.0406***	***0.0440***	***0.0476***	***0.0532***	***0.0563***	***0.0505***	***0.0383***	***0.0318***	***0.0286***	***0.0231***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.41E-03	5.29E-03	3.63E-03	2.88E-03	2.52E-03	5.07E-03	1.14E-02	2.54E-02	3.98E-02	3.72E-02	3.21E-02	2.99E-02	2.82E-02	2.63E-02	2.70E-02	2.93E-02	3.17E-02	3.55E-02	3.75E-02	3.36E-02	2.55E-02	2.12E-02	1.91E-02	1.54E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.71E-03	2.64E-03	1.82E-03	1.44E-03	1.26E-03	2.53E-03	5.68E-03	1.27E-02	1.99E-02	1.86E-02	1.61E-02	1.49E-02	1.41E-02	1.31E-02	1.35E-02	1.47E-02	1.59E-02	1.77E-02	1.88E-02	1.68E-02	1.28E-02	1.06E-02	9.54E-03	7.71E-03
	Emission in each Box of 1st jet	g/s	9.27E-04	6.61E-04	4.54E-04	3.60E-04	3.15E-04	6.34E-04	1.42E-03	3.17E-03	4.97E-03	4.64E-03	4.01E-03	3.73E-03	3.53E-03	3.29E-03	3.38E-03	3.66E-03	3.96E-03	4.44E-03	4.69E-03	4.21E-03	3.19E-03	2.65E-03	2.39E-03	1.93E-03
	Emission in each Box of 2nd jet	g/s	5.30E-04	3.78E-04	2.59E-04	2.06E-04	1.80E-04	3.62E-04	8.12E-04	1.81E-03	2.84E-03	2.65E-03	2.29E-03	2.13E-03	2.02E-03	1.88E-03	1.93E-03	2.09E-03	2.26E-03	2.53E-03	2.68E-03	2.40E-03	1.82E-03	1.51E-03	1.36E-03	1.10E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0024***	***0.0064***	***0.0115***	***0.0108***	***0.0093***	***0.0086***	***0.0072***	***0.0066***	***0.0068***	***0.0074***	***0.0081***	***0.0090***	***0.0097***	***0.0088***	***0.0065***	***0.0051***	***0.0046***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.45E-03	1.15E-03	7.82E-04	5.98E-04	5.17E-04	7.28E-04	1.57E-03	4.28E-03	7.66E-03	7.17E-03	6.19E-03	5.70E-03	4.77E-03	4.37E-03	4.54E-03	4.93E-03	5.37E-03	6.01E-03	6.45E-03	5.87E-03	4.33E-03	3.40E-03	3.05E-03	2.50E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.24E-04	5.75E-04	3.91E-04	2.99E-04	2.59E-04	3.64E-04	7.87E-04	2.14E-03	3.83E-03	3.59E-03	3.09E-03	2.85E-03	2.39E-03	2.18E-03	2.27E-03	2.46E-03	2.69E-03	3.01E-03	3.23E-03	2.94E-03	2.17E-03	1.70E-03	1.52E-03	1.25E-03
	Emission in each Box of 1st jet	g/s	1.81E-04	1.44E-04	9.78E-05	7.48E-05	6.47E-05	9.10E-05	1.97E-04	5.35E-04	9.57E-04	8.97E-04	7.73E-04	7.13E-04	5.97E-04	5.46E-04	5.67E-04	6.16E-04	6.72E-04	7.51E-04	8.07E-04	7.34E-04	5.41E-04	4.25E-04	3.81E-04	3.12E-04
	Emission in each Box of 2nd jet	g/s	1.03E-04	8.21E-05	5.59E-05	4.27E-05	3.70E-05	5.20E-05	1.12E-04	3.05E-04	5.47E-04	5.12E-04	4.42E-04	4.07E-04	3.41E-04	3.12E-04	3.24E-04	3.52E-04	3.84E-04	4.29E-04	4.61E-04	4.20E-04	3.09E-04	2.43E-04	2.18E-04	1.78E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2281	0.1937	0.1909	0.2022	0.2094	0.3492	0.3630	0.3159	0.3392	0.3265	0.3115	0.3068	0.3098	0.3006	0.2996	0.3062	0.3117	0.3229	0.3249	0.3078	0.2857	0.2942	0.2864	0.2670
	NO2	g/vehicle/km	0.0446	0.0423	0.0415	0.0423	0.0435	0.0505	0.0506	0.0537	0.0658	0.0635	0.0605	0.0588	0.0526	0.0503	0.0505	0.0518	0.0531	0.0550	0.0562	0.0540	0.0488	0.0474	0.0458	0.0434
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0107***	***0.0074***	***0.0050***	***0.0039***	***0.0034***	***0.0069***	***0.0152***	***0.0328***	***0.0528***	***0.0493***	***0.0431***	***0.0406***	***0.0390***	***0.0354***	***0.0374***	***0.0401***	***0.0427***	***0.0476***	***0.0506***	***0.0459***	***0.0352***	***0.0298***	***0.0271***	***0.0221***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.14E-03	4.94E-03	3.34E-03	2.62E-03	2.28E-03	4.57E-03	1.01E-02	2.19E-02	3.52E-02	3.29E-02	2.87E-02	2.71E-02	2.60E-02	2.36E-02	2.49E-02	2.67E-02	2.85E-02	3.17E-02	3.37E-02	3.06E-02	2.34E-02	1.99E-02	1.81E-02	1.47E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.57E-03	2.47E-03	1.67E-03	1.31E-03	1.14E-03	2.29E-03	5.05E-03	1.09E-02	1.76E-02	1.64E-02	1.44E-02	1.35E-02	1.30E-02	1.18E-02	1.25E-02	1.34E-02	1.42E-02	1.59E-02	1.69E-02	1.53E-02	1.17E-02	9.95E-03	9.04E-03	7.37E-03
	Emission in each Box of 1st jet	g/s	8.93E-04	6.17E-04	4.18E-04	3.28E-04	2.85E-04	5.71E-04	1.26E-03	2.74E-03	4.40E-03	4.11E-03	3.59E-03	3.38E-03	3.25E-03	2.95E-03	3.11E-03	3.34E-03	3.56E-03	3.97E-03	4.21E-03	3.83E-03	2.93E-03	2.49E-03	2.26E-03	1.84E-03
	Emission in each Box of 2nd jet	g/s	5.10E-04	3.53E-04	2.39E-04	1.87E-04	1.63E-04	3.27E-04	7.22E-04	1.56E-03	2.52E-03	2.35E-03	2.05E-03	1.93E-03	1.85E-03	1.69E-03	1.78E-03	1.91E-03	2.03E-03	2.27E-03	2.41E-03	2.19E-03	1.67E-03	1.42E-03	1.29E-03	1.05E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0021***	***0.0056***	***0.0102***	***0.0096***	***0.0084***	***0.0078***	***0.0066***	***0.0059***	***0.0063***	***0.0068***	***0.0073***	***0.0081***	***0.0087***	***0.0081***	***0.0060***	***0.0048***	***0.0043***	***0.0036***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.40E-03	1.08E-03	7.25E-04	5.49E-04	4.74E-04	6.61E-04	1.41E-03	3.72E-03	6.83E-03	6.39E-03	5.58E-03	5.19E-03	4.41E-03	3.95E-03	4.20E-03	4.52E-03	4.85E-03	5.41E-03	5.83E-03	5.38E-03	4.00E-03	3.21E-03	2.89E-03	2.39E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.99E-04	5.40E-04	3.63E-04	2.74E-04	2.37E-04	3.31E-04	7.04E-04	1.86E-03	3.41E-03	3.20E-03	2.79E-03	2.60E-03	2.21E-03	1.97E-03	2.10E-03	2.26E-03	2.43E-03	2.70E-03	2.92E-03	2.69E-03	2.00E-03	1.60E-03	1.45E-03	1.20E-03
	Emission in each Box of 1st jet	g/s	1.75E-04	1.35E-04	9.07E-05	6.86E-05	5.92E-05	8.26E-05	1.76E-04	4.65E-04	8.54E-04	7.99E-04	6.97E-04	6.49E-04	5.51E-04	4.94E-04	5.25E-04	5.65E-04	6.07E-04	6.76E-04	7.29E-04	6.72E-04	5.00E-04	4.01E-04	3.62E-04	2.99E-04
	Emission in each Box of 2nd jet	g/s	9.98E-05	7.71E-05	5.18E-05	3.92E-05	3.38E-05	4.72E-05	1.01E-04	2.66E-04	4.88E-04	4.57E-04	3.98E-04	3.71E-04	3.15E-04	2.82E-04	3.00E-04	3.23E-04	3.47E-04	3.86E-04	4.17E-04	3.84E-04	2.86E-04	2.29E-04	2.07E-04	1.71E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2082	0.1837	0.1859	0.1953	0.2016	0.3336	0.3467	0.3111	0.3379	0.3217	0.3062	0.2960	0.2988	0.3014	0.2965	0.3056	0.3095	0.3272	0.3370	0.3125	0.2893	0.2949	0.2839	0.2705
	NO2	g/vehicle/km	0.0410	0.0403	0.0405	0.0410	0.0420	0.0483	0.0484	0.0529	0.0656	0.0626	0.0594	0.0569	0.0509	0.0504	0.0500	0.0517	0.0528	0.0557	0.0582	0.0548	0.0493	0.0476	0.0455	0.0439
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0098***	***0.0070***	***0.0049***	***0.0038***	***0.0033***	***0.0066***	***0.0145***	***0.0323***	***0.0526***	***0.0486***	***0.0423***	***0.0392***	***0.0376***	***0.0355***	***0.0370***	***0.0400***	***0.0424***	***0.0482***	***0.0525***	***0.0467***	***0.0356***	***0.0299***	***0.0269***	***0.0224***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.52E-03	4.68E-03	3.25E-03	2.53E-03	2.20E-03	4.37E-03	9.65E-03	2.16E-02	3.51E-02	3.24E-02	2.82E-02	2.61E-02	2.50E-02	2.37E-02	2.47E-02	2.67E-02	2.83E-02	3.22E-02	3.50E-02	3.11E-02	2.37E-02	1.99E-02	1.79E-02	1.49E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.26E-03	2.34E-03	1.63E-03	1.27E-03	1.10E-03	2.18E-03	4.83E-03	1.08E-02	1.75E-02	1.62E-02	1.41E-02	1.31E-02	1.25E-02	1.18E-02	1.23E-02	1.33E-02	1.41E-02	1.61E-02	1.75E-02	1.56E-02	1.19E-02	9.97E-03	8.96E-03	7.47E-03
	Emission in each Box of 1st jet	g/s	8.15E-04	5.86E-04	4.07E-04	3.17E-04	2.74E-04	5.46E-04	1.21E-03	2.69E-03	4.39E-03	4.05E-03	3.53E-03	3.27E-03	3.13E-03	2.96E-03	3.08E-03	3.33E-03	3.53E-03	4.02E-03	4.37E-03	3.89E-03	2.97E-03	2.49E-03	2.24E-03	1.87E-03
	Emission in each Box of 2nd jet	g/s	4.66E-04	3.35E-04	2.32E-04	1.81E-04	1.57E-04	3.12E-04	6.89E-04	1.54E-03	2.51E-03	2.31E-03	2.02E-03	1.87E-03	1.79E-03	1.69E-03	1.76E-03	1.91E-03	2.02E-03	2.30E-03	2.50E-03	2.22E-03	1.70E-03	1.42E-03	1.28E-03	1.07E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0011***	***0.0008***	***0.0007***	***0.0009***	***0.0020***	***0.0055***	***0.0102***	***0.0094***	***0.0082***	***0.0075***	***0.0064***	***0.0059***	***0.0062***	***0.0068***	***0.0072***	***0.0082***	***0.0091***	***0.0082***	***0.0061***	***0.0048***	***0.0043***	***0.0036***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.28E-03	1.03E-03	7.08E-04	5.32E-04	4.57E-04	6.33E-04	1.35E-03	3.66E-03	6.81E-03	6.30E-03	5.48E-03	5.02E-03	4.26E-03	3.96E-03	4.16E-03	4.51E-03	4.82E-03	5.47E-03	6.04E-03	5.46E-03	4.05E-03	3.22E-03	2.87E-03	2.42E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.41E-04	5.14E-04	3.54E-04	2.66E-04	2.29E-04	3.16E-04	6.74E-04	1.83E-03	3.40E-03	3.15E-03	2.74E-03	2.51E-03	2.13E-03	1.98E-03	2.08E-03	2.26E-03	2.41E-03	2.74E-03	3.02E-03	2.73E-03	2.02E-03	1.61E-03	1.43E-03	1.21E-03
	Emission in each Box of 1st jet	g/s	1.60E-04	1.29E-04	8.85E-05	6.64E-05	5.72E-05	7.91E-05	1.68E-04	4.58E-04	8.51E-04	7.87E-04	6.84E-04	6.28E-04	5.33E-04	4.95E-04	5.20E-04	5.64E-04	6.02E-04	6.84E-04	7.55E-04	6.82E-04	5.06E-04	4.02E-04	3.59E-04	3.03E-04
	Emission in each Box of 2nd jet	g/s	9.16E-05	7.35E-05	5.06E-05	3.80E-05	3.27E-05	4.52E-05	9.63E-05	2.62E-04	4.86E-04	4.50E-04	3.91E-04	3.59E-04	3.05E-04	2.83E-04	2.97E-04	3.22E-04	3.44E-04	3.91E-04	4.32E-04	3.90E-04	2.89E-04	2.30E-04	2.05E-04	1.73E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2036	0.1774	0.1784	0.1871	0.1904	0.3252	0.3331	0.2971	0.3205	0.3218	0.3109	0.3103	0.3098	0.3062	0.3024	0.3141	0.3068	0.3229	0.3261	0.3003	0.2707	0.2761	0.2663	0.2465
	NO2	g/vehicle/km	0.0401	0.0390	0.0389	0.0394	0.0398	0.0472	0.0466	0.0506	0.0623	0.0626	0.0603	0.0595	0.0526	0.0512	0.0510	0.0531	0.0523	0.0550	0.0564	0.0528	0.0463	0.0447	0.0428	0.0402
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0096***	***0.0068***	***0.0047***	***0.0036***	***0.0031***	***0.0064***	***0.0139***	***0.0309***	***0.0499***	***0.0486***	***0.0430***	***0.0411***	***0.0390***	***0.0361***	***0.0377***	***0.0411***	***0.0420***	***0.0476***	***0.0508***	***0.0448***	***0.0333***	***0.0280***	***0.0252***	***0.0204***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.38E-03	4.53E-03	3.12E-03	2.43E-03	2.07E-03	4.26E-03	9.27E-03	2.06E-02	3.33E-02	3.24E-02	2.87E-02	2.74E-02	2.60E-02	2.40E-02	2.52E-02	2.74E-02	2.80E-02	3.17E-02	3.38E-02	2.99E-02	2.22E-02	1.87E-02	1.68E-02	1.36E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.19E-03	2.26E-03	1.56E-03	1.21E-03	1.04E-03	2.13E-03	4.64E-03	1.03E-02	1.66E-02	1.62E-02	1.43E-02	1.37E-02	1.30E-02	1.20E-02	1.26E-02	1.37E-02	1.40E-02	1.59E-02	1.69E-02	1.49E-02	1.11E-02	9.34E-03	8.41E-03	6.81E-03
	Emission in each Box of 1st jet	g/s	7.97E-04	5.66E-04	3.90E-04	3.03E-04	2.59E-04	5.32E-04	1.16E-03	2.57E-03	4.16E-03	4.05E-03	3.58E-03	3.42E-03	3.25E-03	3.01E-03	3.14E-03	3.43E-03	3.50E-03	3.97E-03	4.23E-03	3.74E-03	2.78E-03	2.33E-03	2.10E-03	1.70E-03
	Emission in each Box of 2nd jet	g/s	4.55E-04	3.23E-04	2.23E-04	1.73E-04	1.48E-04	3.04E-04	6.62E-04	1.47E-03	2.38E-03	2.31E-03	2.05E-03	1.96E-03	1.85E-03	1.72E-03	1.80E-03	1.96E-03	2.00E-03	2.27E-03	2.42E-03	2.13E-03	1.59E-03	1.33E-03	1.20E-03	9.72E-04
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0006***	***0.0009***	***0.0019***	***0.0053***	***0.0097***	***0.0094***	***0.0083***	***0.0079***	***0.0066***	***0.0060***	***0.0064***	***0.0070***	***0.0072***	***0.0081***	***0.0088***	***0.0079***	***0.0057***	***0.0045***	***0.0041***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.26E-03	9.95E-04	6.81E-04	5.10E-04	4.33E-04	6.18E-04	1.30E-03	3.51E-03	6.47E-03	6.30E-03	5.56E-03	5.25E-03	4.41E-03	4.02E-03	4.24E-03	4.63E-03	4.78E-03	5.41E-03	5.85E-03	5.26E-03	3.80E-03	3.02E-03	2.70E-03	2.22E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.28E-04	4.98E-04	3.40E-04	2.55E-04	2.17E-04	3.09E-04	6.49E-04	1.75E-03	3.23E-03	3.15E-03	2.78E-03	2.63E-03	2.21E-03	2.01E-03	2.12E-03	2.32E-03	2.39E-03	2.70E-03	2.92E-03	2.63E-03	1.90E-03	1.51E-03	1.35E-03	1.11E-03
	Emission in each Box of 1st jet	g/s	1.57E-04	1.24E-04	8.51E-05	6.38E-05	5.42E-05	7.72E-05	1.62E-04	4.38E-04	8.08E-04	7.87E-04	6.95E-04	6.57E-04	5.51E-04	5.02E-04	5.30E-04	5.79E-04	5.98E-04	6.76E-04	7.31E-04	6.57E-04	4.75E-04	3.78E-04	3.38E-04	2.77E-04
	Emission in each Box of 2nd jet	g/s	8.97E-05	7.11E-05	4.86E-05	3.65E-05	3.09E-05	4.41E-05	9.27E-05	2.50E-04	4.62E-04	4.50E-04	3.97E-04	3.75E-04	3.15E-04	2.87E-04	3.03E-04	3.31E-04	3.42E-04	3.86E-04	4.18E-04	3.75E-04	2.71E-04	2.16E-04	1.93E-04	1.59E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2151	0.1822	0.1844	0.1969	0.2016	0.3323	0.3453	0.2957	0.3236	0.3155	0.3041	0.2972	0.3013	0.3057	0.3028	0.3100	0.3273	0.3380	0.3443	0.3177	0.2837	0.2803	0.2762	0.2592
	NO2	g/vehicle/km	0.0423	0.0400	0.0402	0.0413	0.0420	0.0481	0.0482	0.0504	0.0629	0.0614	0.0590	0.0571	0.0513	0.0511	0.0511	0.0524	0.0557	0.0575	0.0594	0.0556	0.0484	0.0453	0.0443	0.0422
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0101***	***0.0070***	***0.0048***	***0.0038***	***0.0033***	***0.0065***	***0.0144***	***0.0307***	***0.0504***	***0.0477***	***0.0421***	***0.0394***	***0.0379***	***0.0360***	***0.0378***	***0.0406***	***0.0448***	***0.0498***	***0.0536***	***0.0474***	***0.0349***	***0.0284***	***0.0262***	***0.0215***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.74E-03	4.65E-03	3.23E-03	2.55E-03	2.20E-03	4.35E-03	9.61E-03	2.05E-02	3.36E-02	3.18E-02	2.80E-02	2.62E-02	2.52E-02	2.40E-02	2.52E-02	2.71E-02	2.99E-02	3.32E-02	3.57E-02	3.16E-02	2.33E-02	1.90E-02	1.74E-02	1.43E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.37E-03	2.32E-03	1.61E-03	1.28E-03	1.10E-03	2.18E-03	4.81E-03	1.02E-02	1.68E-02	1.59E-02	1.40E-02	1.31E-02	1.26E-02	1.20E-02	1.26E-02	1.35E-02	1.49E-02	1.66E-02	1.79E-02	1.58E-02	1.16E-02	9.48E-03	8.72E-03	7.16E-03
	Emission in each Box of 1st jet	g/s	8.42E-04	5.81E-04	4.03E-04	3.19E-04	2.74E-04	5.44E-04	1.20E-03	2.56E-03	4.20E-03	3.97E-03	3.51E-03	3.28E-03	3.16E-03	3.00E-03	3.15E-03	3.38E-03	3.74E-03	4.15E-03	4.47E-03	3.95E-03	2.91E-03	2.37E-03	2.18E-03	1.79E-03
	Emission in each Box of 2nd jet	g/s	4.81E-04	3.32E-04	2.31E-04	1.82E-04	1.57E-04	3.11E-04	6.87E-04	1.46E-03	2.40E-03	2.27E-03	2.00E-03	1.87E-03	1.80E-03	1.71E-03	1.80E-03	1.93E-03	2.14E-03	2.37E-03	2.55E-03	2.26E-03	1.66E-03	1.35E-03	1.25E-03	1.02E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0015***	***0.0011***	***0.0008***	***0.0007***	***0.0009***	***0.0020***	***0.0052***	***0.0098***	***0.0093***	***0.0082***	***0.0076***	***0.0064***	***0.0060***	***0.0064***	***0.0069***	***0.0076***	***0.0085***	***0.0092***	***0.0083***	***0.0060***	***0.0046***	***0.0042***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.32E-03	1.02E-03	7.03E-04	5.36E-04	4.57E-04	6.30E-04	1.34E-03	3.49E-03	6.53E-03	6.18E-03	5.44E-03	5.04E-03	4.30E-03	4.01E-03	4.25E-03	4.57E-03	5.09E-03	5.65E-03	6.16E-03	5.54E-03	3.97E-03	3.06E-03	2.80E-03	2.33E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.62E-04	5.10E-04	3.52E-04	2.68E-04	2.29E-04	3.15E-04	6.71E-04	1.75E-03	3.26E-03	3.09E-03	2.72E-03	2.52E-03	2.15E-03	2.01E-03	2.12E-03	2.29E-03	2.54E-03	2.83E-03	3.08E-03	2.77E-03	1.99E-03	1.53E-03	1.40E-03	1.17E-03
	Emission in each Box of 1st jet	g/s	1.65E-04	1.27E-04	8.79E-05	6.69E-05	5.72E-05	7.88E-05	1.68E-04	4.36E-04	8.16E-04	7.73E-04	6.80E-04	6.30E-04	5.37E-04	5.02E-04	5.31E-04	5.72E-04	6.36E-04	7.06E-04	7.71E-04	6.92E-04	4.97E-04	3.83E-04	3.50E-04	2.91E-04
	Emission in each Box of 2nd jet	g/s	9.46E-05	7.29E-05	5.02E-05	3.83E-05	3.27E-05	4.50E-05	9.59E-05	2.49E-04	4.66E-04	4.42E-04	3.89E-04	3.60E-04	3.07E-04	2.87E-04	3.03E-04	3.27E-04	3.63E-04	4.04E-04	4.40E-04	3.96E-04	2.84E-04	2.19E-04	2.00E-04	1.66E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2136	0.1861	0.1819	0.1889	0.2006	0.3237	0.3378	0.2909	0.3100	0.3017	0.3016	0.2840	0.2963	0.2971	0.3007	0.2940	0.2947	0.3201	0.3290	0.3034	0.2833	0.2830	0.2754	0.2563
	NO2	g/vehicle/km	0.0420	0.0408	0.0396	0.0397	0.0418	0.0470	0.0472	0.0496	0.0603	0.0588	0.0585	0.0547	0.0504	0.0497	0.0507	0.0498	0.0504	0.0546	0.0568	0.0533	0.0484	0.0457	0.0442	0.0418
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0100***	***0.0071***	***0.0048***	***0.0037***	***0.0033***	***0.0064***	***0.0141***	***0.0302***	***0.0483***	***0.0456***	***0.0417***	***0.0376***	***0.0372***	***0.0350***	***0.0375***	***0.0385***	***0.0404***	***0.0472***	***0.0512***	***0.0453***	***0.0349***	***0.0287***	***0.0261***	***0.0212***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.69E-03	4.75E-03	3.18E-03	2.45E-03	2.18E-03	4.24E-03	9.40E-03	2.02E-02	3.22E-02	3.04E-02	2.78E-02	2.51E-02	2.48E-02	2.33E-02	2.50E-02	2.57E-02	2.69E-02	3.15E-02	3.41E-02	3.02E-02	2.32E-02	1.91E-02	1.74E-02	1.42E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.34E-03	2.37E-03	1.59E-03	1.22E-03	1.09E-03	2.12E-03	4.70E-03	1.01E-02	1.61E-02	1.52E-02	1.39E-02	1.25E-02	1.24E-02	1.17E-02	1.25E-02	1.28E-02	1.35E-02	1.57E-02	1.71E-02	1.51E-02	1.16E-02	9.57E-03	8.69E-03	7.08E-03
	Emission in each Box of 1st jet	g/s	8.36E-04	5.94E-04	3.98E-04	3.06E-04	2.73E-04	5.30E-04	1.18E-03	2.52E-03	4.02E-03	3.80E-03	3.48E-03	3.13E-03	3.10E-03	2.92E-03	3.13E-03	3.21E-03	3.37E-03	3.93E-03	4.27E-03	3.77E-03	2.91E-03	2.39E-03	2.17E-03	1.77E-03
	Emission in each Box of 2nd jet	g/s	4.78E-04	3.39E-04	2.27E-04	1.75E-04	1.56E-04	3.03E-04	6.72E-04	1.44E-03	2.30E-03	2.17E-03	1.99E-03	1.79E-03	1.77E-03	1.67E-03	1.79E-03	1.83E-03	1.92E-03	2.25E-03	2.44E-03	2.16E-03	1.66E-03	1.37E-03	1.24E-03	1.01E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0010***	***0.0008***	***0.0007***	***0.0009***	***0.0020***	***0.0052***	***0.0094***	***0.0089***	***0.0081***	***0.0072***	***0.0063***	***0.0059***	***0.0063***	***0.0065***	***0.0069***	***0.0080***	***0.0088***	***0.0080***	***0.0060***	***0.0046***	***0.0042***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.32E-03	1.04E-03	6.94E-04	5.15E-04	4.55E-04	6.15E-04	1.31E-03	3.43E-03	6.26E-03	5.92E-03	5.40E-03	4.82E-03	4.23E-03	3.90E-03	4.22E-03	4.35E-03	4.60E-03	5.36E-03	5.90E-03	5.31E-03	3.97E-03	3.09E-03	2.79E-03	2.31E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.58E-04	5.21E-04	3.47E-04	2.57E-04	2.27E-04	3.07E-04	6.57E-04	1.72E-03	3.13E-03	2.96E-03	2.70E-03	2.41E-03	2.11E-03	1.95E-03	2.11E-03	2.17E-03	2.30E-03	2.68E-03	2.95E-03	2.65E-03	1.98E-03	1.55E-03	1.40E-03	1.15E-03
	Emission in each Box of 1st jet	g/s	1.64E-04	1.30E-04	8.67E-05	6.43E-05	5.69E-05	7.69E-05	1.64E-04	4.29E-04	7.83E-04	7.40E-04	6.75E-04	6.03E-04	5.28E-04	4.88E-04	5.27E-04	5.43E-04	5.75E-04	6.70E-04	7.37E-04	6.63E-04	4.96E-04	3.86E-04	3.49E-04	2.88E-04
	Emission in each Box of 2nd jet	g/s	9.39E-05	7.44E-05	4.96E-05	3.68E-05	3.25E-05	4.39E-05	9.39E-05	2.45E-04	4.47E-04	4.23E-04	3.85E-04	3.45E-04	3.02E-04	2.79E-04	3.01E-04	3.11E-04	3.29E-04	3.83E-04	4.21E-04	3.79E-04	2.83E-04	2.21E-04	1.99E-04	1.65E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2428	0.2140	0.2106	0.2223	0.2311	0.3893	0.4025	0.3467	0.3681	0.3543	0.3366	0.3319	0.3382	0.3318	0.3241	0.3381	0.3399	0.3591	0.3687	0.3429	0.3185	0.3180	0.3124	0.2960
	NO2	g/vehicle/km	0.0472	0.0463	0.0453	0.0461	0.0474	0.0558	0.0557	0.0585	0.0709	0.0685	0.0650	0.0634	0.0572	0.0551	0.0544	0.0568	0.0576	0.0608	0.0633	0.0598	0.0539	0.0510	0.0497	0.0478
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0114***	***0.0082***	***0.0055***	***0.0043***	***0.0038***	***0.0076***	***0.0168***	***0.0360***	***0.0573***	***0.0535***	***0.0466***	***0.0439***	***0.0425***	***0.0391***	***0.0404***	***0.0443***	***0.0466***	***0.0530***	***0.0574***	***0.0512***	***0.0392***	***0.0323***	***0.0296***	***0.0245***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.60E-03	5.46E-03	3.69E-03	2.88E-03	2.52E-03	5.10E-03	1.12E-02	2.40E-02	3.82E-02	3.57E-02	3.10E-02	2.93E-02	2.83E-02	2.61E-02	2.70E-02	2.95E-02	3.10E-02	3.53E-02	3.83E-02	3.41E-02	2.61E-02	2.15E-02	1.97E-02	1.63E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.80E-03	2.73E-03	1.84E-03	1.44E-03	1.26E-03	2.55E-03	5.60E-03	1.20E-02	1.91E-02	1.78E-02	1.55E-02	1.46E-02	1.42E-02	1.30E-02	1.35E-02	1.48E-02	1.55E-02	1.77E-02	1.91E-02	1.71E-02	1.31E-02	1.08E-02	9.86E-03	8.17E-03
	Emission in each Box of 1st jet	g/s	9.50E-04	6.82E-04	4.61E-04	3.60E-04	3.15E-04	6.37E-04	1.40E-03	3.00E-03	4.78E-03	4.46E-03	3.88E-03	3.66E-03	3.54E-03	3.26E-03	3.37E-03	3.69E-03	3.88E-03	4.41E-03	4.78E-03	4.27E-03	3.27E-03	2.69E-03	2.47E-03	2.04E-03
	Emission in each Box of 2nd jet	g/s	5.43E-04	3.90E-04	2.63E-04	2.06E-04	1.80E-04	3.64E-04	8.00E-04	1.72E-03	2.73E-03	2.55E-03	2.22E-03	2.09E-03	2.02E-03	1.86E-03	1.93E-03	2.11E-03	2.22E-03	2.52E-03	2.73E-03	2.44E-03	1.87E-03	1.54E-03	1.41E-03	1.17E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0023***	***0.0061***	***0.0110***	***0.0103***	***0.0090***	***0.0084***	***0.0072***	***0.0065***	***0.0068***	***0.0074***	***0.0079***	***0.0090***	***0.0098***	***0.0089***	***0.0066***	***0.0052***	***0.0047***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.48E-03	1.18E-03	7.92E-04	5.97E-04	5.17E-04	7.31E-04	1.55E-03	4.05E-03	7.36E-03	6.90E-03	5.99E-03	5.59E-03	4.79E-03	4.33E-03	4.52E-03	4.96E-03	5.26E-03	5.98E-03	6.57E-03	5.95E-03	4.42E-03	3.45E-03	3.14E-03	2.64E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.40E-04	5.91E-04	3.96E-04	2.99E-04	2.58E-04	3.66E-04	7.75E-04	2.03E-03	3.68E-03	3.45E-03	3.00E-03	2.80E-03	2.40E-03	2.16E-03	2.26E-03	2.48E-03	2.63E-03	2.99E-03	3.28E-03	2.97E-03	2.21E-03	1.72E-03	1.57E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	1.85E-04	1.48E-04	9.90E-05	7.47E-05	6.46E-05	9.14E-05	1.94E-04	5.07E-04	9.20E-04	8.62E-04	7.49E-04	6.99E-04	5.99E-04	5.41E-04	5.65E-04	6.20E-04	6.58E-04	7.47E-04	8.21E-04	7.43E-04	5.52E-04	4.31E-04	3.92E-04	3.30E-04
	Emission in each Box of 2nd jet	g/s	1.06E-04	8.44E-05	5.66E-05	4.27E-05	3.69E-05	5.22E-05	1.11E-04	2.89E-04	5.26E-04	4.93E-04	4.28E-04	4.00E-04	3.42E-04	3.09E-04	3.23E-04	3.54E-04	3.76E-04	4.27E-04	4.69E-04	4.25E-04	3.16E-04	2.46E-04	2.24E-04	1.88E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2651	0.2294	0.2289	0.2429	0.2520	0.4210	0.4396	0.3748	0.3975	0.3814	0.3636	0.3534	0.3624	0.3588	0.3521	0.3613	0.3643	0.3826	0.3928	0.3717	0.3411	0.3470	0.3390	0.3194
	NO2	g/vehicle/km	0.0512	0.0494	0.0488	0.0499	0.0514	0.0601	0.0606	0.0629	0.0762	0.0734	0.0697	0.0670	0.0608	0.0592	0.0587	0.0604	0.0614	0.0644	0.0671	0.0644	0.0574	0.0552	0.0536	0.0512
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0125***	***0.0088***	***0.0060***	***0.0047***	***0.0041***	***0.0083***	***0.0184***	***0.0389***	***0.0619***	***0.0576***	***0.0503***	***0.0468***	***0.0456***	***0.0423***	***0.0439***	***0.0473***	***0.0499***	***0.0564***	***0.0611***	***0.0555***	***0.0420***	***0.0352***	***0.0321***	***0.0264***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.30E-03	5.85E-03	4.01E-03	3.15E-03	2.74E-03	5.51E-03	1.22E-02	2.60E-02	4.13E-02	3.84E-02	3.35E-02	3.12E-02	3.04E-02	2.82E-02	2.93E-02	3.15E-02	3.33E-02	3.76E-02	4.08E-02	3.70E-02	2.80E-02	2.35E-02	2.14E-02	1.76E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.15E-03	2.93E-03	2.00E-03	1.57E-03	1.37E-03	2.76E-03	6.12E-03	1.30E-02	2.06E-02	1.92E-02	1.68E-02	1.56E-02	1.52E-02	1.41E-02	1.46E-02	1.58E-02	1.66E-02	1.88E-02	2.04E-02	1.85E-02	1.40E-02	1.17E-02	1.07E-02	8.82E-03
	Emission in each Box of 1st jet	g/s	1.04E-03	7.32E-04	5.01E-04	3.94E-04	3.43E-04	6.89E-04	1.53E-03	3.25E-03	5.16E-03	4.80E-03	4.19E-03	3.90E-03	3.80E-03	3.52E-03	3.66E-03	3.94E-03	4.16E-03	4.70E-03	5.10E-03	4.62E-03	3.50E-03	2.93E-03	2.68E-03	2.20E-03
	Emission in each Box of 2nd jet	g/s	5.93E-04	4.18E-04	2.86E-04	2.25E-04	1.96E-04	3.94E-04	8.74E-04	1.85E-03	2.95E-03	2.74E-03	2.39E-03	2.23E-03	2.17E-03	2.01E-03	2.09E-03	2.25E-03	2.38E-03	2.69E-03	2.91E-03	2.64E-03	2.00E-03	1.68E-03	1.53E-03	1.26E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0012***	***0.0025***	***0.0065***	***0.0119***	***0.0111***	***0.0096***	***0.0089***	***0.0076***	***0.0070***	***0.0073***	***0.0079***	***0.0084***	***0.0095***	***0.0104***	***0.0096***	***0.0071***	***0.0056***	***0.0051***	***0.0042***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.60E-03	1.26E-03	8.54E-04	6.47E-04	5.59E-04	7.87E-04	1.69E-03	4.36E-03	7.91E-03	7.39E-03	6.42E-03	5.92E-03	5.09E-03	4.65E-03	4.88E-03	5.27E-03	5.61E-03	6.33E-03	6.96E-03	6.41E-03	4.71E-03	3.73E-03	3.38E-03	2.83E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.02E-04	6.30E-04	4.27E-04	3.24E-04	2.80E-04	3.94E-04	8.43E-04	2.18E-03	3.95E-03	3.69E-03	3.21E-03	2.96E-03	2.55E-03	2.32E-03	2.44E-03	2.63E-03	2.80E-03	3.17E-03	3.48E-03	3.20E-03	2.36E-03	1.87E-03	1.69E-03	1.41E-03
	Emission in each Box of 1st jet	g/s	2.01E-04	1.58E-04	1.07E-04	8.09E-05	6.99E-05	9.84E-05	2.11E-04	5.45E-04	9.88E-04	9.23E-04	8.03E-04	7.40E-04	6.37E-04	5.81E-04	6.10E-04	6.59E-04	7.01E-04	7.92E-04	8.70E-04	8.01E-04	5.89E-04	4.67E-04	4.23E-04	3.53E-04
	Emission in each Box of 2nd jet	g/s	1.15E-04	9.01E-05	6.10E-05	4.62E-05	4.00E-05	5.62E-05	1.20E-04	3.11E-04	5.65E-04	5.28E-04	4.59E-04	4.23E-04	3.64E-04	3.32E-04	3.49E-04	3.76E-04	4.01E-04	4.52E-04	4.97E-04	4.58E-04	3.37E-04	2.67E-04	2.42E-04	2.02E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2751	0.2394	0.2389	0.2539	0.2622	0.4338	0.4529	0.3881	0.4090	0.3920	0.3736	0.3658	0.3734	0.3678	0.3613	0.3717	0.3771	0.3999	0.4056	0.3835	0.3527	0.3585	0.3508	0.3318
	NO2	g/vehicle/km	0.0528	0.0510	0.0504	0.0516	0.0529	0.0616	0.0620	0.0648	0.0779	0.0750	0.0712	0.0690	0.0623	0.0604	0.0599	0.0618	0.0632	0.0669	0.0689	0.0660	0.0590	0.0567	0.0551	0.0529
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0129***	***0.0092***	***0.0063***	***0.0049***	***0.0043***	***0.0085***	***0.0189***	***0.0403***	***0.0637***	***0.0592***	***0.0517***	***0.0484***	***0.0469***	***0.0433***	***0.0451***	***0.0487***	***0.0517***	***0.0590***	***0.0631***	***0.0573***	***0.0434***	***0.0364***	***0.0332***	***0.0275***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.61E-03	6.11E-03	4.18E-03	3.29E-03	2.86E-03	5.68E-03	1.26E-02	2.69E-02	4.25E-02	3.95E-02	3.44E-02	3.23E-02	3.13E-02	2.89E-02	3.01E-02	3.24E-02	3.44E-02	3.93E-02	4.21E-02	3.82E-02	2.89E-02	2.42E-02	2.21E-02	1.83E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.31E-03	3.05E-03	2.09E-03	1.65E-03	1.43E-03	2.84E-03	6.30E-03	1.34E-02	2.12E-02	1.97E-02	1.72E-02	1.61E-02	1.56E-02	1.44E-02	1.50E-02	1.62E-02	1.72E-02	1.97E-02	2.10E-02	1.91E-02	1.45E-02	1.21E-02	1.11E-02	9.16E-03
	Emission in each Box of 1st jet	g/s	1.08E-03	7.63E-04	5.23E-04	4.11E-04	3.57E-04	7.10E-04	1.58E-03	3.36E-03	5.31E-03	4.93E-03	4.31E-03	4.04E-03	3.91E-03	3.61E-03	3.76E-03	4.06E-03	4.31E-03	4.91E-03	5.26E-03	4.77E-03	3.62E-03	3.03E-03	2.77E-03	2.29E-03
	Emission in each Box of 2nd jet	g/s	6.15E-04	4.36E-04	2.99E-04	2.35E-04	2.04E-04	4.06E-04	9.01E-04	1.92E-03	3.03E-03	2.82E-03	2.46E-03	2.31E-03	2.24E-03	2.06E-03	2.15E-03	2.32E-03	2.46E-03	2.81E-03	3.01E-03	2.73E-03	2.07E-03	1.73E-03	1.58E-03	1.31E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0020***	***0.0013***	***0.0010***	***0.0009***	***0.0012***	***0.0026***	***0.0067***	***0.0121***	***0.0113***	***0.0099***	***0.0091***	***0.0078***	***0.0071***	***0.0075***	***0.0081***	***0.0087***	***0.0099***	***0.0107***	***0.0099***	***0.0073***	***0.0058***	***0.0052***	***0.0044***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.65E-03	1.30E-03	8.82E-04	6.69E-04	5.76E-04	8.06E-04	1.73E-03	4.49E-03	8.09E-03	7.55E-03	6.57E-03	6.09E-03	5.22E-03	4.74E-03	4.98E-03	5.39E-03	5.77E-03	6.57E-03	7.15E-03	6.57E-03	4.84E-03	3.83E-03	3.48E-03	2.92E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.27E-04	6.51E-04	4.41E-04	3.35E-04	2.88E-04	4.03E-04	8.63E-04	2.24E-03	4.05E-03	3.77E-03	3.28E-03	3.05E-03	2.61E-03	2.37E-03	2.49E-03	2.70E-03	2.89E-03	3.29E-03	3.57E-03	3.28E-03	2.42E-03	1.92E-03	1.74E-03	1.46E-03
	Emission in each Box of 1st jet	g/s	2.07E-04	1.63E-04	1.10E-04	8.36E-05	7.20E-05	1.01E-04	2.16E-04	5.61E-04	1.01E-03	9.43E-04	8.21E-04	7.62E-04	6.53E-04	5.93E-04	6.23E-04	6.74E-04	7.22E-04	8.22E-04	8.94E-04	8.21E-04	6.05E-04	4.79E-04	4.35E-04	3.65E-04
	Emission in each Box of 2nd jet	g/s	1.18E-04	9.30E-05	6.30E-05	4.78E-05	4.12E-05	5.76E-05	1.23E-04	3.20E-04	5.78E-04	5.39E-04	4.69E-04	4.35E-04	3.73E-04	3.39E-04	3.56E-04	3.85E-04	4.12E-04	4.70E-04	5.11E-04	4.69E-04	3.46E-04	2.74E-04	2.49E-04	2.08E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1470	0.1273	0.1293	0.1379	0.1396	0.2396	0.2514	0.1890	0.1830	0.1757	0.1703	0.1708	0.2157	0.2124	0.2136	0.2189	0.2234	0.2385	0.2437	0.2291	0.2106	0.2107	0.2096	0.2007
	NO2	g/vehicle/km	0.0252	0.0243	0.0249	0.0253	0.0254	0.0306	0.0312	0.0280	0.0322	0.0308	0.0293	0.0289	0.0349	0.0334	0.0343	0.0355	0.0368	0.0399	0.0414	0.0393	0.0339	0.0313	0.0310	0.0301
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0086***	***0.0061***	***0.0043***	***0.0034***	***0.0028***	***0.0056***	***0.0126***	***0.0242***	***0.0354***	***0.0330***	***0.0293***	***0.0281***	***0.0385***	***0.0355***	***0.0379***	***0.0407***	***0.0435***	***0.0500***	***0.0540***	***0.0487***	***0.0368***	***0.0302***	***0.0281***	***0.0237***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.74E-03	4.06E-03	2.83E-03	2.24E-03	1.88E-03	3.77E-03	8.40E-03	1.61E-02	2.36E-02	2.20E-02	1.95E-02	1.87E-02	2.57E-02	2.37E-02	2.52E-02	2.71E-02	2.90E-02	3.33E-02	3.60E-02	3.25E-02	2.45E-02	2.01E-02	1.87E-02	1.58E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.87E-03	2.03E-03	1.42E-03	1.12E-03	9.38E-04	1.88E-03	4.20E-03	8.06E-03	1.18E-02	1.10E-02	9.76E-03	9.36E-03	1.28E-02	1.18E-02	1.26E-02	1.36E-02	1.45E-02	1.67E-02	1.80E-02	1.62E-02	1.23E-02	1.01E-02	9.36E-03	7.89E-03
	Emission in each Box of 1st jet	g/s	1.15E-03	8.12E-04	5.67E-04	4.48E-04	3.75E-04	7.53E-04	1.68E-03	3.22E-03	4.72E-03	4.40E-03	3.90E-03	3.74E-03	5.14E-03	4.73E-03	5.05E-03	5.43E-03	5.80E-03	6.67E-03	7.19E-03	6.49E-03	4.91E-03	4.03E-03	3.75E-03	3.16E-03
	Emission in each Box of 2nd jet	g/s	9.57E-04	6.76E-04	4.72E-04	3.73E-04	3.13E-04	6.28E-04	1.40E-03	2.69E-03	3.93E-03	3.67E-03	3.25E-03	3.12E-03	4.28E-03	3.94E-03	4.21E-03	4.52E-03	4.83E-03	5.56E-03	6.00E-03	5.41E-03	4.09E-03	3.36E-03	3.12E-03	2.63E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0016***	***0.0036***	***0.0062***	***0.0058***	***0.0050***	***0.0048***	***0.0062***	***0.0056***	***0.0061***	***0.0066***	***0.0072***	***0.0084***	***0.0092***	***0.0083***	***0.0059***	***0.0045***	***0.0042***	***0.0036***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.84E-04	7.76E-04	5.46E-04	4.10E-04	3.41E-04	4.80E-04	1.04E-03	2.39E-03	4.15E-03	3.86E-03	3.35E-03	3.17E-03	4.15E-03	3.72E-03	4.05E-03	4.40E-03	4.77E-03	5.58E-03	6.12E-03	5.56E-03	3.95E-03	2.99E-03	2.77E-03	2.37E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.92E-04	3.88E-04	2.73E-04	2.05E-04	1.71E-04	2.40E-04	5.22E-04	1.19E-03	2.08E-03	1.93E-03	1.68E-03	1.59E-03	2.08E-03	1.86E-03	2.02E-03	2.20E-03	2.38E-03	2.79E-03	3.06E-03	2.78E-03	1.97E-03	1.49E-03	1.39E-03	1.19E-03
	Emission in each Box of 1st jet	g/s	1.97E-04	1.55E-04	1.09E-04	8.21E-05	6.82E-05	9.61E-05	2.09E-04	4.77E-04	8.30E-04	7.71E-04	6.70E-04	6.34E-04	8.31E-04	7.44E-04	8.10E-04	8.80E-04	9.54E-04	1.12E-03	1.22E-03	1.11E-03	7.89E-04	5.98E-04	5.54E-04	4.74E-04
	Emission in each Box of 2nd jet	g/s	1.64E-04	1.29E-04	9.09E-05	6.84E-05	5.69E-05	8.01E-05	1.74E-04	3.98E-04	6.92E-04	6.43E-04	5.59E-04	5.29E-04	6.92E-04	6.20E-04	6.75E-04	7.33E-04	7.95E-04	9.30E-04	1.02E-03	9.27E-04	6.58E-04	4.98E-04	4.62E-04	3.95E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1334	0.1149	0.1162	0.1248	0.1299	0.2263	0.2387	0.1775	0.1718	0.1674	0.1627	0.1624	0.2050	0.1994	0.2018	0.2074	0.2117	0.2232	0.2226	0.2090	0.1911	0.1918	0.1910	0.1826
	NO2	g/vehicle/km	0.0233	0.0225	0.0229	0.0234	0.0241	0.0292	0.0299	0.0266	0.0307	0.0296	0.0283	0.0279	0.0335	0.0317	0.0328	0.0340	0.0351	0.0378	0.0383	0.0363	0.0312	0.0289	0.0287	0.0278
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0078***	***0.0055***	***0.0038***	***0.0030***	***0.0026***	***0.0053***	***0.0120***	***0.0227***	***0.0332***	***0.0314***	***0.0280***	***0.0267***	***0.0366***	***0.0333***	***0.0358***	***0.0386***	***0.0412***	***0.0468***	***0.0493***	***0.0444***	***0.0334***	***0.0275***	***0.0256***	***0.0215***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.21E-03	3.66E-03	2.55E-03	2.02E-03	1.75E-03	3.56E-03	7.97E-03	1.51E-02	2.22E-02	2.10E-02	1.86E-02	1.78E-02	2.44E-02	2.22E-02	2.38E-02	2.57E-02	2.75E-02	3.12E-02	3.29E-02	2.96E-02	2.23E-02	1.83E-02	1.71E-02	1.44E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.60E-03	1.83E-03	1.27E-03	1.01E-03	8.73E-04	1.78E-03	3.99E-03	7.56E-03	1.11E-02	1.05E-02	9.32E-03	8.90E-03	1.22E-02	1.11E-02	1.19E-02	1.29E-02	1.37E-02	1.56E-02	1.64E-02	1.48E-02	1.11E-02	9.17E-03	8.53E-03	7.18E-03
	Emission in each Box of 1st jet	g/s	1.04E-03	7.32E-04	5.10E-04	4.05E-04	3.49E-04	7.11E-04	1.59E-03	3.03E-03	4.43E-03	4.19E-03	3.73E-03	3.56E-03	4.88E-03	4.44E-03	4.77E-03	5.14E-03	5.49E-03	6.24E-03	6.57E-03	5.92E-03	4.45E-03	3.67E-03	3.41E-03	2.87E-03
	Emission in each Box of 2nd jet	g/s	8.68E-04	6.10E-04	4.25E-04	3.37E-04	2.91E-04	5.93E-04	1.33E-03	2.52E-03	3.69E-03	3.49E-03	3.11E-03	2.97E-03	4.07E-03	3.70E-03	3.97E-03	4.29E-03	4.58E-03	5.20E-03	5.48E-03	4.93E-03	3.71E-03	3.06E-03	2.84E-03	2.39E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0034***	***0.0059***	***0.0056***	***0.0049***	***0.0046***	***0.0060***	***0.0053***	***0.0058***	***0.0063***	***0.0068***	***0.0079***	***0.0085***	***0.0077***	***0.0054***	***0.0041***	***0.0038***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.11E-04	7.17E-04	5.03E-04	3.80E-04	3.24E-04	4.59E-04	1.00E-03	2.27E-03	3.96E-03	3.71E-03	3.24E-03	3.05E-03	3.99E-03	3.53E-03	3.87E-03	4.21E-03	4.56E-03	5.29E-03	5.65E-03	5.14E-03	3.63E-03	2.76E-03	2.56E-03	2.19E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.55E-04	3.58E-04	2.51E-04	1.90E-04	1.62E-04	2.29E-04	5.00E-04	1.13E-03	1.98E-03	1.86E-03	1.62E-03	1.53E-03	1.99E-03	1.77E-03	1.94E-03	2.11E-03	2.28E-03	2.64E-03	2.83E-03	2.57E-03	1.82E-03	1.38E-03	1.28E-03	1.10E-03
	Emission in each Box of 1st jet	g/s	1.82E-04	1.43E-04	1.01E-04	7.60E-05	6.49E-05	9.18E-05	2.00E-04	4.53E-04	7.91E-04	7.42E-04	6.48E-04	6.11E-04	7.97E-04	7.07E-04	7.74E-04	8.43E-04	9.12E-04	1.06E-03	1.13E-03	1.03E-03	7.27E-04	5.52E-04	5.13E-04	4.38E-04
	Emission in each Box of 2nd jet	g/s	1.52E-04	1.19E-04	8.38E-05	6.33E-05	5.40E-05	7.65E-05	1.67E-04	3.78E-04	6.59E-04	6.18E-04	5.40E-04	5.09E-04	6.65E-04	5.89E-04	6.45E-04	7.02E-04	7.60E-04	8.81E-04	9.42E-04	8.57E-04	6.05E-04	4.60E-04	4.27E-04	3.65E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1346	0.1147	0.1162	0.1249	0.1274	0.2206	0.2309	0.1746	0.1686	0.1623	0.1540	0.1539	0.1944	0.1916	0.1925	0.1979	0.2029	0.2163	0.2213	0.2091	0.1936	0.1922	0.1946	0.1868
	NO2	g/vehicle/km	0.0235	0.0225	0.0229	0.0235	0.0237	0.0286	0.0291	0.0262	0.0301	0.0289	0.0269	0.0266	0.0320	0.0306	0.0314	0.0326	0.0339	0.0368	0.0382	0.0364	0.0316	0.0290	0.0292	0.0285
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0079***	***0.0055***	***0.0038***	***0.0030***	***0.0026***	***0.0052***	***0.0116***	***0.0223***	***0.0326***	***0.0305***	***0.0265***	***0.0253***	***0.0347***	***0.0320***	***0.0341***	***0.0368***	***0.0395***	***0.0453***	***0.0490***	***0.0444***	***0.0338***	***0.0276***	***0.0261***	***0.0220***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.25E-03	3.65E-03	2.55E-03	2.03E-03	1.71E-03	3.47E-03	7.71E-03	1.49E-02	2.18E-02	2.03E-02	1.76E-02	1.69E-02	2.31E-02	2.14E-02	2.27E-02	2.45E-02	2.63E-02	3.02E-02	3.27E-02	2.96E-02	2.25E-02	1.84E-02	1.74E-02	1.47E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.63E-03	1.83E-03	1.27E-03	1.01E-03	8.56E-04	1.73E-03	3.86E-03	7.44E-03	1.09E-02	1.02E-02	8.82E-03	8.43E-03	1.16E-02	1.07E-02	1.14E-02	1.23E-02	1.32E-02	1.51E-02	1.63E-02	1.48E-02	1.13E-02	9.19E-03	8.69E-03	7.35E-03
	Emission in each Box of 1st jet	g/s	1.05E-03	7.31E-04	5.09E-04	4.05E-04	3.42E-04	6.94E-04	1.54E-03	2.98E-03	4.35E-03	4.06E-03	3.53E-03	3.37E-03	4.63E-03	4.27E-03	4.55E-03	4.91E-03	5.27E-03	6.05E-03	6.53E-03	5.93E-03	4.51E-03	3.68E-03	3.48E-03	2.94E-03
	Emission in each Box of 2nd jet	g/s	8.75E-04	6.09E-04	4.25E-04	3.38E-04	2.85E-04	5.78E-04	1.29E-03	2.48E-03	3.63E-03	3.39E-03	2.94E-03	2.81E-03	3.86E-03	3.56E-03	3.79E-03	4.09E-03	4.39E-03	5.04E-03	5.45E-03	4.94E-03	3.76E-03	3.06E-03	2.90E-03	2.45E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0034***	***0.0058***	***0.0054***	***0.0046***	***0.0044***	***0.0057***	***0.0051***	***0.0056***	***0.0061***	***0.0066***	***0.0077***	***0.0085***	***0.0077***	***0.0055***	***0.0042***	***0.0039***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.19E-04	7.16E-04	5.03E-04	3.81E-04	3.19E-04	4.49E-04	9.72E-04	2.24E-03	3.89E-03	3.61E-03	3.09E-03	2.92E-03	3.81E-03	3.41E-03	3.71E-03	4.04E-03	4.40E-03	5.14E-03	5.64E-03	5.15E-03	3.68E-03	2.77E-03	2.61E-03	2.24E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.60E-04	3.58E-04	2.52E-04	1.90E-04	1.60E-04	2.24E-04	4.86E-04	1.12E-03	1.94E-03	1.81E-03	1.54E-03	1.46E-03	1.90E-03	1.71E-03	1.86E-03	2.02E-03	2.20E-03	2.57E-03	2.82E-03	2.58E-03	1.84E-03	1.39E-03	1.31E-03	1.12E-03
	Emission in each Box of 1st jet	g/s	1.84E-04	1.43E-04	1.01E-04	7.61E-05	6.38E-05	8.98E-05	1.94E-04	4.47E-04	7.78E-04	7.23E-04	6.17E-04	5.83E-04	7.62E-04	6.83E-04	7.43E-04	8.09E-04	8.81E-04	1.03E-03	1.13E-03	1.03E-03	7.35E-04	5.55E-04	5.22E-04	4.48E-04
	Emission in each Box of 2nd jet	g/s	1.53E-04	1.19E-04	8.38E-05	6.34E-05	5.32E-05	7.48E-05	1.62E-04	3.73E-04	6.48E-04	6.02E-04	5.14E-04	4.86E-04	6.35E-04	5.69E-04	6.19E-04	6.74E-04	7.34E-04	8.57E-04	9.39E-04	8.59E-04	6.13E-04	4.62E-04	4.35E-04	3.73E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1233	0.1063	0.1089	0.1170	0.1195	0.2095	0.2228	0.1742	0.1673	0.1618	0.1560	0.1540	0.1917	0.1897	0.1883	0.1938	0.1993	0.2096	0.2114	0.1970	0.1807	0.1792	0.1776	0.1670
	NO2	g/vehicle/km	0.0218	0.0211	0.0218	0.0223	0.0225	0.0273	0.0282	0.0263	0.0301	0.0289	0.0274	0.0267	0.0317	0.0304	0.0309	0.0320	0.0334	0.0358	0.0367	0.0345	0.0297	0.0272	0.0269	0.0257
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0072***	***0.0051***	***0.0036***	***0.0028***	***0.0024***	***0.0049***	***0.0112***	***0.0223***	***0.0324***	***0.0304***	***0.0268***	***0.0253***	***0.0342***	***0.0317***	***0.0334***	***0.0360***	***0.0388***	***0.0439***	***0.0468***	***0.0419***	***0.0316***	***0.0257***	***0.0238***	***0.0197***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.81E-03	3.39E-03	2.39E-03	1.90E-03	1.61E-03	3.29E-03	7.44E-03	1.48E-02	2.16E-02	2.03E-02	1.79E-02	1.69E-02	2.28E-02	2.11E-02	2.22E-02	2.40E-02	2.59E-02	2.93E-02	3.12E-02	2.79E-02	2.10E-02	1.71E-02	1.59E-02	1.31E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.41E-03	1.69E-03	1.19E-03	9.49E-04	8.03E-04	1.65E-03	3.72E-03	7.42E-03	1.08E-02	1.01E-02	8.93E-03	8.44E-03	1.14E-02	1.06E-02	1.11E-02	1.20E-02	1.29E-02	1.46E-02	1.56E-02	1.40E-02	1.05E-02	8.57E-03	7.94E-03	6.57E-03
	Emission in each Box of 1st jet	g/s	9.62E-04	6.78E-04	4.77E-04	3.80E-04	3.21E-04	6.59E-04	1.49E-03	2.97E-03	4.32E-03	4.05E-03	3.57E-03	3.38E-03	4.56E-03	4.23E-03	4.45E-03	4.81E-03	5.17E-03	5.86E-03	6.24E-03	5.58E-03	4.21E-03	3.43E-03	3.17E-03	2.63E-03
	Emission in each Box of 2nd jet	g/s	8.02E-04	5.65E-04	3.98E-04	3.16E-04	2.68E-04	5.49E-04	1.24E-03	2.47E-03	3.60E-03	3.38E-03	2.98E-03	2.81E-03	3.80E-03	3.52E-03	3.71E-03	4.00E-03	4.31E-03	4.88E-03	5.20E-03	4.65E-03	3.51E-03	2.86E-03	2.65E-03	2.19E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0006***	***0.0014***	***0.0034***	***0.0058***	***0.0054***	***0.0047***	***0.0044***	***0.0057***	***0.0051***	***0.0055***	***0.0060***	***0.0065***	***0.0075***	***0.0081***	***0.0073***	***0.0052***	***0.0039***	***0.0036***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.52E-04	6.74E-04	4.78E-04	3.62E-04	3.03E-04	4.28E-04	9.41E-04	2.24E-03	3.88E-03	3.62E-03	3.13E-03	2.93E-03	3.77E-03	3.39E-03	3.65E-03	3.97E-03	4.34E-03	5.00E-03	5.41E-03	4.89E-03	3.46E-03	2.60E-03	2.41E-03	2.03E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.26E-04	3.37E-04	2.39E-04	1.81E-04	1.51E-04	2.14E-04	4.70E-04	1.12E-03	1.94E-03	1.81E-03	1.57E-03	1.47E-03	1.88E-03	1.69E-03	1.82E-03	1.99E-03	2.17E-03	2.50E-03	2.71E-03	2.45E-03	1.73E-03	1.30E-03	1.20E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	1.70E-04	1.35E-04	9.55E-05	7.23E-05	6.05E-05	8.57E-05	1.88E-04	4.48E-04	7.76E-04	7.24E-04	6.27E-04	5.86E-04	7.54E-04	6.78E-04	7.30E-04	7.95E-04	8.68E-04	1.00E-03	1.08E-03	9.79E-04	6.93E-04	5.21E-04	4.81E-04	4.05E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	1.12E-04	7.96E-05	6.03E-05	5.04E-05	7.14E-05	1.57E-04	3.73E-04	6.47E-04	6.03E-04	5.22E-04	4.88E-04	6.28E-04	5.65E-04	6.08E-04	6.62E-04	7.23E-04	8.34E-04	9.02E-04	8.16E-04	5.77E-04	4.34E-04	4.01E-04	3.38E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1187	0.0989	0.0996	0.1058	0.1077	0.1883	0.1973	0.1491	0.1471	0.1421	0.1386	0.1389	0.1760	0.1700	0.1734	0.1763	0.1787	0.1870	0.1894	0.1791	0.1657	0.1681	0.1681	0.1597
	NO2	g/vehicle/km	0.0210	0.0198	0.0202	0.0204	0.0206	0.0247	0.0252	0.0228	0.0267	0.0257	0.0246	0.0243	0.0293	0.0275	0.0286	0.0294	0.0302	0.0322	0.0331	0.0316	0.0275	0.0257	0.0256	0.0246
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0069***	***0.0047***	***0.0033***	***0.0026***	***0.0022***	***0.0044***	***0.0099***	***0.0191***	***0.0285***	***0.0267***	***0.0238***	***0.0228***	***0.0314***	***0.0284***	***0.0307***	***0.0328***	***0.0348***	***0.0392***	***0.0419***	***0.0381***	***0.0289***	***0.0241***	***0.0225***	***0.0188***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.63E-03	3.15E-03	2.19E-03	1.72E-03	1.45E-03	2.96E-03	6.59E-03	1.27E-02	1.90E-02	1.78E-02	1.59E-02	1.52E-02	2.09E-02	1.89E-02	2.05E-02	2.19E-02	2.32E-02	2.61E-02	2.80E-02	2.54E-02	1.93E-02	1.61E-02	1.50E-02	1.26E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.32E-03	1.58E-03	1.09E-03	8.58E-04	7.24E-04	1.48E-03	3.30E-03	6.36E-03	9.49E-03	8.89E-03	7.94E-03	7.61E-03	1.05E-02	9.47E-03	1.02E-02	1.09E-02	1.16E-02	1.31E-02	1.40E-02	1.27E-02	9.65E-03	8.04E-03	7.51E-03	6.28E-03
	Emission in each Box of 1st jet	g/s	9.27E-04	6.31E-04	4.37E-04	3.43E-04	2.90E-04	5.92E-04	1.32E-03	2.54E-03	3.79E-03	3.56E-03	3.18E-03	3.04E-03	4.19E-03	3.79E-03	4.10E-03	4.37E-03	4.64E-03	5.23E-03	5.59E-03	5.07E-03	3.86E-03	3.21E-03	3.00E-03	2.51E-03
	Emission in each Box of 2nd jet	g/s	7.72E-04	5.25E-04	3.64E-04	2.86E-04	2.41E-04	4.93E-04	1.10E-03	2.12E-03	3.16E-03	2.96E-03	2.65E-03	2.54E-03	3.49E-03	3.16E-03	3.41E-03	3.64E-03	3.86E-03	4.36E-03	4.66E-03	4.23E-03	3.22E-03	2.68E-03	2.50E-03	2.09E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0029***	***0.0052***	***0.0048***	***0.0042***	***0.0040***	***0.0052***	***0.0046***	***0.0051***	***0.0055***	***0.0059***	***0.0068***	***0.0073***	***0.0067***	***0.0048***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.21E-04	6.31E-04	4.42E-04	3.31E-04	2.77E-04	3.89E-04	8.41E-04	1.94E-03	3.45E-03	3.22E-03	2.82E-03	2.67E-03	3.48E-03	3.06E-03	3.38E-03	3.64E-03	3.92E-03	4.50E-03	4.89E-03	4.48E-03	3.20E-03	2.45E-03	2.28E-03	1.94E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.11E-04	3.16E-04	2.21E-04	1.66E-04	1.38E-04	1.94E-04	4.21E-04	9.71E-04	1.72E-03	1.61E-03	1.41E-03	1.33E-03	1.74E-03	1.53E-03	1.69E-03	1.82E-03	1.96E-03	2.25E-03	2.44E-03	2.24E-03	1.60E-03	1.23E-03	1.14E-03	9.70E-04
	Emission in each Box of 1st jet	g/s	1.64E-04	1.26E-04	8.84E-05	6.62E-05	5.53E-05	7.77E-05	1.68E-04	3.88E-04	6.90E-04	6.43E-04	5.64E-04	5.33E-04	6.96E-04	6.12E-04	6.75E-04	7.28E-04	7.84E-04	9.00E-04	9.77E-04	8.96E-04	6.40E-04	4.91E-04	4.57E-04	3.88E-04
	Emission in each Box of 2nd jet	g/s	1.37E-04	1.05E-04	7.37E-05	5.52E-05	4.61E-05	6.48E-05	1.40E-04	3.24E-04	5.75E-04	5.36E-04	4.70E-04	4.44E-04	5.80E-04	5.10E-04	5.63E-04	6.07E-04	6.53E-04	7.50E-04	8.14E-04	7.46E-04	5.34E-04	4.09E-04	3.81E-04	3.23E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1078	0.0935	0.0969	0.1020	0.1035	0.1796	0.1882	0.1468	0.1465	0.1399	0.1361	0.1339	0.1696	0.1704	0.1715	0.1760	0.1774	0.1896	0.1966	0.1818	0.1678	0.1685	0.1666	0.1617
	NO2	g/vehicle/km	0.0193	0.0189	0.0197	0.0198	0.0199	0.0237	0.0241	0.0224	0.0267	0.0253	0.0242	0.0235	0.0283	0.0276	0.0283	0.0293	0.0300	0.0326	0.0343	0.0321	0.0278	0.0257	0.0253	0.0250
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0063***	***0.0045***	***0.0032***	***0.0025***	***0.0021***	***0.0042***	***0.0094***	***0.0188***	***0.0283***	***0.0263***	***0.0234***	***0.0220***	***0.0303***	***0.0285***	***0.0304***	***0.0327***	***0.0345***	***0.0398***	***0.0435***	***0.0386***	***0.0293***	***0.0242***	***0.0223***	***0.0191***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.21E-03	2.98E-03	2.13E-03	1.65E-03	1.39E-03	2.82E-03	6.29E-03	1.25E-02	1.89E-02	1.75E-02	1.56E-02	1.47E-02	2.02E-02	1.90E-02	2.03E-02	2.18E-02	2.30E-02	2.65E-02	2.90E-02	2.58E-02	1.95E-02	1.61E-02	1.49E-02	1.27E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.10E-03	1.49E-03	1.06E-03	8.27E-04	6.95E-04	1.41E-03	3.14E-03	6.26E-03	9.45E-03	8.76E-03	7.80E-03	7.34E-03	1.01E-02	9.49E-03	1.01E-02	1.09E-02	1.15E-02	1.33E-02	1.45E-02	1.29E-02	9.77E-03	8.06E-03	7.44E-03	6.36E-03
	Emission in each Box of 1st jet	g/s	8.41E-04	5.96E-04	4.25E-04	3.31E-04	2.78E-04	5.65E-04	1.26E-03	2.50E-03	3.78E-03	3.50E-03	3.12E-03	2.93E-03	4.04E-03	3.80E-03	4.05E-03	4.36E-03	4.60E-03	5.30E-03	5.80E-03	5.15E-03	3.91E-03	3.22E-03	2.98E-03	2.55E-03
	Emission in each Box of 2nd jet	g/s	7.01E-04	4.97E-04	3.54E-04	2.76E-04	2.32E-04	4.71E-04	1.05E-03	2.09E-03	3.15E-03	2.92E-03	2.60E-03	2.45E-03	3.36E-03	3.16E-03	3.38E-03	3.64E-03	3.84E-03	4.42E-03	4.84E-03	4.29E-03	3.26E-03	2.69E-03	2.48E-03	2.12E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0029***	***0.0052***	***0.0048***	***0.0042***	***0.0039***	***0.0050***	***0.0046***	***0.0050***	***0.0055***	***0.0058***	***0.0068***	***0.0076***	***0.0068***	***0.0049***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.55E-04	6.02E-04	4.31E-04	3.21E-04	2.67E-04	3.73E-04	8.05E-04	1.91E-03	3.44E-03	3.17E-03	2.77E-03	2.58E-03	3.37E-03	3.07E-03	3.34E-03	3.63E-03	3.89E-03	4.56E-03	5.06E-03	4.54E-03	3.24E-03	2.46E-03	2.26E-03	1.96E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.77E-04	3.01E-04	2.16E-04	1.60E-04	1.34E-04	1.86E-04	4.03E-04	9.56E-04	1.72E-03	1.59E-03	1.39E-03	1.29E-03	1.68E-03	1.53E-03	1.67E-03	1.82E-03	1.95E-03	2.28E-03	2.53E-03	2.27E-03	1.62E-03	1.23E-03	1.13E-03	9.82E-04
	Emission in each Box of 1st jet	g/s	1.51E-04	1.20E-04	8.63E-05	6.42E-05	5.34E-05	7.45E-05	1.61E-04	3.83E-04	6.88E-04	6.35E-04	5.55E-04	5.16E-04	6.73E-04	6.14E-04	6.69E-04	7.27E-04	7.78E-04	9.11E-04	1.01E-03	9.09E-04	6.48E-04	4.92E-04	4.53E-04	3.93E-04
	Emission in each Box of 2nd jet	g/s	1.26E-04	1.00E-04	7.19E-05	5.35E-05	4.45E-05	6.21E-05	1.34E-04	3.19E-04	5.73E-04	5.29E-04	4.62E-04	4.30E-04	5.61E-04	5.12E-04	5.57E-04	6.06E-04	6.49E-04	7.60E-04	8.44E-04	7.57E-04	5.40E-04	4.10E-04	3.77E-04	3.27E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1054	0.0902	0.0928	0.0976	0.0975	0.1750	0.1807	0.1400	0.1387	0.1400	0.1384	0.1406	0.1760	0.1732	0.1750	0.1810	0.1758	0.1871	0.1902	0.1747	0.1568	0.1576	0.1561	0.1472
	NO2	g/vehicle/km	0.0189	0.0182	0.0189	0.0189	0.0188	0.0231	0.0232	0.0215	0.0253	0.0253	0.0246	0.0246	0.0293	0.0280	0.0288	0.0301	0.0298	0.0322	0.0332	0.0309	0.0261	0.0242	0.0239	0.0229
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0062***	***0.0043***	***0.0031***	***0.0024***	***0.0020***	***0.0041***	***0.0091***	***0.0179***	***0.0268***	***0.0263***	***0.0238***	***0.0231***	***0.0314***	***0.0289***	***0.0310***	***0.0337***	***0.0342***	***0.0392***	***0.0421***	***0.0371***	***0.0274***	***0.0226***	***0.0209***	***0.0174***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.11E-03	2.88E-03	2.04E-03	1.58E-03	1.31E-03	2.75E-03	6.03E-03	1.19E-02	1.79E-02	1.75E-02	1.59E-02	1.54E-02	2.09E-02	1.93E-02	2.07E-02	2.24E-02	2.28E-02	2.62E-02	2.81E-02	2.47E-02	1.83E-02	1.51E-02	1.40E-02	1.16E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.06E-03	1.44E-03	1.02E-03	7.92E-04	6.55E-04	1.38E-03	3.02E-03	5.97E-03	8.94E-03	8.76E-03	7.93E-03	7.70E-03	1.05E-02	9.65E-03	1.03E-02	1.12E-02	1.14E-02	1.31E-02	1.40E-02	1.24E-02	9.13E-03	7.54E-03	6.98E-03	5.79E-03
	Emission in each Box of 1st jet	g/s	8.23E-04	5.75E-04	4.07E-04	3.17E-04	2.62E-04	5.50E-04	1.21E-03	2.39E-03	3.58E-03	3.51E-03	3.17E-03	3.08E-03	4.19E-03	3.86E-03	4.13E-03	4.49E-03	4.56E-03	5.23E-03	5.62E-03	4.95E-03	3.65E-03	3.01E-03	2.79E-03	2.32E-03
	Emission in each Box of 2nd jet	g/s	6.86E-04	4.79E-04	3.39E-04	2.64E-04	2.18E-04	4.58E-04	1.01E-03	1.99E-03	2.98E-03	2.92E-03	2.64E-03	2.57E-03	3.49E-03	3.22E-03	3.45E-03	3.74E-03	3.80E-03	4.36E-03	4.68E-03	4.12E-03	3.04E-03	2.51E-03	2.33E-03	1.93E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0005***	***0.0012***	***0.0027***	***0.0049***	***0.0048***	***0.0042***	***0.0040***	***0.0052***	***0.0047***	***0.0051***	***0.0056***	***0.0058***	***0.0068***	***0.0074***	***0.0066***	***0.0046***	***0.0035***	***0.0032***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.37E-04	5.81E-04	4.14E-04	3.07E-04	2.52E-04	3.63E-04	7.74E-04	1.83E-03	3.27E-03	3.17E-03	2.81E-03	2.69E-03	3.48E-03	3.11E-03	3.41E-03	3.73E-03	3.86E-03	4.50E-03	4.90E-03	4.38E-03	3.04E-03	2.31E-03	2.13E-03	1.80E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.68E-04	2.90E-04	2.07E-04	1.54E-04	1.26E-04	1.81E-04	3.87E-04	9.16E-04	1.63E-03	1.59E-03	1.41E-03	1.35E-03	1.74E-03	1.56E-03	1.70E-03	1.86E-03	1.93E-03	2.25E-03	2.45E-03	2.19E-03	1.52E-03	1.16E-03	1.07E-03	9.00E-04
	Emission in each Box of 1st jet	g/s	1.47E-04	1.16E-04	8.28E-05	6.15E-05	5.05E-05	7.25E-05	1.55E-04	3.66E-04	6.54E-04	6.35E-04	5.63E-04	5.39E-04	6.96E-04	6.23E-04	6.81E-04	7.46E-04	7.72E-04	9.00E-04	9.81E-04	8.75E-04	6.08E-04	4.62E-04	4.27E-04	3.60E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	9.68E-05	6.90E-05	5.12E-05	4.21E-05	6.04E-05	1.29E-04	3.05E-04	5.45E-04	5.29E-04	4.69E-04	4.49E-04	5.80E-04	5.19E-04	5.68E-04	6.22E-04	6.44E-04	7.50E-04	8.17E-04	7.29E-04	5.06E-04	3.85E-04	3.56E-04	3.00E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1115	0.0927	0.0961	0.1029	0.1035	0.1789	0.1874	0.1393	0.1400	0.1372	0.1352	0.1344	0.1711	0.1729	0.1752	0.1786	0.1877	0.1959	0.2010	0.1849	0.1645	0.1600	0.1620	0.1549
	NO2	g/vehicle/km	0.0199	0.0187	0.0195	0.0199	0.0199	0.0236	0.0240	0.0214	0.0256	0.0249	0.0241	0.0236	0.0285	0.0279	0.0289	0.0297	0.0317	0.0337	0.0350	0.0326	0.0273	0.0245	0.0247	0.0240
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0065***	***0.0044***	***0.0032***	***0.0025***	***0.0021***	***0.0042***	***0.0094***	***0.0178***	***0.0271***	***0.0258***	***0.0232***	***0.0221***	***0.0305***	***0.0289***	***0.0310***	***0.0332***	***0.0365***	***0.0411***	***0.0445***	***0.0393***	***0.0287***	***0.0230***	***0.0217***	***0.0183***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.35E-03	2.95E-03	2.11E-03	1.67E-03	1.39E-03	2.81E-03	6.26E-03	1.19E-02	1.81E-02	1.72E-02	1.55E-02	1.47E-02	2.04E-02	1.93E-02	2.07E-02	2.21E-02	2.44E-02	2.74E-02	2.97E-02	2.62E-02	1.92E-02	1.53E-02	1.45E-02	1.22E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.18E-03	1.48E-03	1.05E-03	8.35E-04	6.95E-04	1.41E-03	3.13E-03	5.94E-03	9.03E-03	8.59E-03	7.74E-03	7.37E-03	1.02E-02	9.63E-03	1.03E-02	1.11E-02	1.22E-02	1.37E-02	1.48E-02	1.31E-02	9.58E-03	7.65E-03	7.24E-03	6.09E-03
	Emission in each Box of 1st jet	g/s	8.71E-04	5.91E-04	4.21E-04	3.34E-04	2.78E-04	5.62E-04	1.25E-03	2.37E-03	3.61E-03	3.43E-03	3.10E-03	2.95E-03	4.07E-03	3.85E-03	4.14E-03	4.43E-03	4.87E-03	5.48E-03	5.93E-03	5.24E-03	3.83E-03	3.06E-03	2.90E-03	2.44E-03
	Emission in each Box of 2nd jet	g/s	7.26E-04	4.92E-04	3.51E-04	2.78E-04	2.32E-04	4.69E-04	1.04E-03	1.98E-03	3.01E-03	2.86E-03	2.58E-03	2.46E-03	3.39E-03	3.21E-03	3.45E-03	3.69E-03	4.06E-03	4.56E-03	4.94E-03	4.37E-03	3.19E-03	2.55E-03	2.41E-03	2.03E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0027***	***0.0049***	***0.0047***	***0.0041***	***0.0039***	***0.0051***	***0.0047***	***0.0051***	***0.0055***	***0.0062***	***0.0071***	***0.0078***	***0.0069***	***0.0048***	***0.0035***	***0.0033***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.78E-04	5.97E-04	4.28E-04	3.23E-04	2.67E-04	3.71E-04	8.02E-04	1.82E-03	3.30E-03	3.11E-03	2.76E-03	2.59E-03	3.39E-03	3.11E-03	3.41E-03	3.68E-03	4.11E-03	4.71E-03	5.17E-03	4.61E-03	3.18E-03	2.35E-03	2.21E-03	1.89E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.89E-04	2.99E-04	2.14E-04	1.62E-04	1.34E-04	1.85E-04	4.01E-04	9.12E-04	1.65E-03	1.56E-03	1.38E-03	1.29E-03	1.70E-03	1.55E-03	1.71E-03	1.84E-03	2.05E-03	2.35E-03	2.59E-03	2.31E-03	1.59E-03	1.17E-03	1.10E-03	9.44E-04
	Emission in each Box of 1st jet	g/s	1.56E-04	1.19E-04	8.57E-05	6.46E-05	5.34E-05	7.42E-05	1.60E-04	3.65E-04	6.60E-04	6.23E-04	5.51E-04	5.18E-04	6.78E-04	6.22E-04	6.83E-04	7.37E-04	8.22E-04	9.42E-04	1.03E-03	9.23E-04	6.36E-04	4.69E-04	4.42E-04	3.77E-04
	Emission in each Box of 2nd jet	g/s	1.30E-04	9.95E-05	7.14E-05	5.39E-05	4.45E-05	6.18E-05	1.34E-04	3.04E-04	5.50E-04	5.19E-04	4.59E-04	4.31E-04	5.65E-04	5.18E-04	5.69E-04	6.14E-04	6.85E-04	7.85E-04	8.62E-04	7.69E-04	5.30E-04	3.91E-04	3.68E-04	3.15E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1107	0.0949	0.0947	0.0986	0.1029	0.1742	0.1833	0.1369	0.1340	0.1309	0.1340	0.1283	0.1682	0.1680	0.1740	0.1692	0.1688	0.1854	0.1918	0.1765	0.1643	0.1615	0.1616	0.1532
	NO2	g/vehicle/km	0.0198	0.0191	0.0193	0.0191	0.0198	0.0230	0.0235	0.0211	0.0245	0.0238	0.0239	0.0226	0.0280	0.0272	0.0287	0.0283	0.0286	0.0319	0.0335	0.0312	0.0273	0.0247	0.0246	0.0237
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0065***	***0.0045***	***0.0031***	***0.0024***	***0.0021***	***0.0041***	***0.0092***	***0.0175***	***0.0259***	***0.0246***	***0.0230***	***0.0211***	***0.0300***	***0.0281***	***0.0308***	***0.0315***	***0.0329***	***0.0389***	***0.0425***	***0.0375***	***0.0287***	***0.0232***	***0.0217***	***0.0181***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.32E-03	3.02E-03	2.08E-03	1.60E-03	1.38E-03	2.74E-03	6.12E-03	1.17E-02	1.73E-02	1.64E-02	1.54E-02	1.41E-02	2.00E-02	1.87E-02	2.06E-02	2.10E-02	2.19E-02	2.59E-02	2.83E-02	2.50E-02	1.91E-02	1.54E-02	1.44E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.16E-03	1.51E-03	1.04E-03	8.00E-04	6.92E-04	1.37E-03	3.06E-03	5.84E-03	8.64E-03	8.20E-03	7.68E-03	7.03E-03	1.00E-02	9.36E-03	1.03E-02	1.05E-02	1.10E-02	1.30E-02	1.42E-02	1.25E-02	9.56E-03	7.72E-03	7.22E-03	6.03E-03
	Emission in each Box of 1st jet	g/s	8.65E-04	6.05E-04	4.15E-04	3.20E-04	2.77E-04	5.48E-04	1.22E-03	2.33E-03	3.46E-03	3.28E-03	3.07E-03	2.81E-03	4.00E-03	3.74E-03	4.11E-03	4.20E-03	4.38E-03	5.18E-03	5.66E-03	5.00E-03	3.83E-03	3.09E-03	2.89E-03	2.41E-03
	Emission in each Box of 2nd jet	g/s	7.21E-04	5.04E-04	3.46E-04	2.67E-04	2.31E-04	4.56E-04	1.02E-03	1.95E-03	2.88E-03	2.73E-03	2.56E-03	2.34E-03	3.34E-03	3.12E-03	3.43E-03	3.50E-03	3.65E-03	4.32E-03	4.72E-03	4.17E-03	3.19E-03	2.57E-03	2.41E-03	2.01E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0005***	***0.0012***	***0.0027***	***0.0047***	***0.0045***	***0.0041***	***0.0037***	***0.0050***	***0.0045***	***0.0051***	***0.0053***	***0.0056***	***0.0067***	***0.0074***	***0.0066***	***0.0048***	***0.0035***	***0.0033***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.73E-04	6.10E-04	4.23E-04	3.10E-04	2.66E-04	3.61E-04	7.84E-04	1.80E-03	3.16E-03	2.98E-03	2.73E-03	2.47E-03	3.34E-03	3.03E-03	3.39E-03	3.50E-03	3.72E-03	4.47E-03	4.94E-03	4.42E-03	3.18E-03	2.37E-03	2.20E-03	1.87E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.86E-04	3.05E-04	2.11E-04	1.55E-04	1.33E-04	1.81E-04	3.92E-04	8.98E-04	1.58E-03	1.49E-03	1.37E-03	1.24E-03	1.67E-03	1.51E-03	1.69E-03	1.75E-03	1.86E-03	2.23E-03	2.47E-03	2.21E-03	1.59E-03	1.18E-03	1.10E-03	9.34E-04
	Emission in each Box of 1st jet	g/s	1.55E-04	1.22E-04	8.45E-05	6.20E-05	5.31E-05	7.22E-05	1.57E-04	3.59E-04	6.32E-04	5.97E-04	5.47E-04	4.94E-04	6.67E-04	6.05E-04	6.78E-04	7.01E-04	7.43E-04	8.93E-04	9.89E-04	8.84E-04	6.35E-04	4.73E-04	4.40E-04	3.74E-04
	Emission in each Box of 2nd jet	g/s	1.29E-04	1.02E-04	7.05E-05	5.17E-05	4.43E-05	6.02E-05	1.31E-04	2.99E-04	5.27E-04	4.97E-04	4.55E-04	4.12E-04	5.56E-04	5.04E-04	5.65E-04	5.84E-04	6.20E-04	7.44E-04	8.24E-04	7.37E-04	5.30E-04	3.94E-04	3.67E-04	3.11E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1267	0.1101	0.1106	0.1170	0.1196	0.2109	0.2196	0.1646	0.1606	0.1551	0.1505	0.1510	0.1926	0.1880	0.1878	0.1951	0.1952	0.2085	0.2156	0.2000	0.1851	0.1820	0.1838	0.1774
	NO2	g/vehicle/km	0.0223	0.0217	0.0221	0.0223	0.0225	0.0274	0.0278	0.0249	0.0289	0.0278	0.0265	0.0262	0.0318	0.0301	0.0308	0.0322	0.0328	0.0356	0.0373	0.0350	0.0304	0.0276	0.0277	0.0271
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0074***	***0.0053***	***0.0036***	***0.0028***	***0.0024***	***0.0050***	***0.0110***	***0.0210***	***0.0311***	***0.0291***	***0.0259***	***0.0248***	***0.0344***	***0.0314***	***0.0333***	***0.0363***	***0.0380***	***0.0437***	***0.0477***	***0.0425***	***0.0323***	***0.0261***	***0.0246***	***0.0209***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.95E-03	3.51E-03	2.43E-03	1.90E-03	1.61E-03	3.31E-03	7.33E-03	1.40E-02	2.07E-02	1.94E-02	1.72E-02	1.65E-02	2.29E-02	2.09E-02	2.22E-02	2.42E-02	2.53E-02	2.91E-02	3.18E-02	2.83E-02	2.16E-02	1.74E-02	1.64E-02	1.40E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.47E-03	1.75E-03	1.21E-03	9.49E-04	8.04E-04	1.66E-03	3.67E-03	7.02E-03	1.04E-02	9.71E-03	8.62E-03	8.27E-03	1.15E-02	1.05E-02	1.11E-02	1.21E-02	1.27E-02	1.46E-02	1.59E-02	1.42E-02	1.08E-02	8.70E-03	8.21E-03	6.98E-03
	Emission in each Box of 1st jet	g/s	9.89E-04	7.02E-04	4.85E-04	3.80E-04	3.22E-04	6.63E-04	1.47E-03	2.81E-03	4.14E-03	3.88E-03	3.45E-03	3.31E-03	4.58E-03	4.19E-03	4.44E-03	4.84E-03	5.07E-03	5.83E-03	6.37E-03	5.67E-03	4.31E-03	3.48E-03	3.28E-03	2.79E-03
	Emission in each Box of 2nd jet	g/s	8.24E-04	5.85E-04	4.04E-04	3.16E-04	2.68E-04	5.52E-04	1.22E-03	2.34E-03	3.45E-03	3.24E-03	2.87E-03	2.76E-03	3.82E-03	3.49E-03	3.70E-03	4.03E-03	4.22E-03	4.86E-03	5.31E-03	4.72E-03	3.59E-03	2.90E-03	2.74E-03	2.33E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0006***	***0.0014***	***0.0032***	***0.0056***	***0.0052***	***0.0046***	***0.0043***	***0.0057***	***0.0050***	***0.0055***	***0.0060***	***0.0064***	***0.0075***	***0.0083***	***0.0074***	***0.0053***	***0.0040***	***0.0037***	***0.0032***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.71E-04	6.92E-04	4.84E-04	3.61E-04	3.02E-04	4.30E-04	9.27E-04	2.12E-03	3.73E-03	3.48E-03	3.04E-03	2.88E-03	3.78E-03	3.36E-03	3.64E-03	4.00E-03	4.25E-03	4.98E-03	5.51E-03	4.96E-03	3.54E-03	2.64E-03	2.48E-03	2.14E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.36E-04	3.46E-04	2.42E-04	1.81E-04	1.51E-04	2.15E-04	4.64E-04	1.06E-03	1.86E-03	1.74E-03	1.52E-03	1.44E-03	1.89E-03	1.68E-03	1.82E-03	2.00E-03	2.13E-03	2.49E-03	2.75E-03	2.48E-03	1.77E-03	1.32E-03	1.24E-03	1.07E-03
	Emission in each Box of 1st jet	g/s	1.74E-04	1.38E-04	9.67E-05	7.22E-05	6.05E-05	8.61E-05	1.85E-04	4.24E-04	7.45E-04	6.95E-04	6.07E-04	5.75E-04	7.56E-04	6.72E-04	7.27E-04	7.99E-04	8.50E-04	9.95E-04	1.10E-03	9.91E-04	7.08E-04	5.28E-04	4.95E-04	4.27E-04
	Emission in each Box of 2nd jet	g/s	1.45E-04	1.15E-04	8.06E-05	6.02E-05	5.04E-05	7.17E-05	1.55E-04	3.53E-04	6.21E-04	5.79E-04	5.06E-04	4.79E-04	6.30E-04	5.60E-04	6.06E-04	6.66E-04	7.09E-04	8.29E-04	9.18E-04	8.26E-04	5.90E-04	4.40E-04	4.13E-04	3.56E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1392	0.1185	0.1210	0.1286	0.1311	0.2286	0.2405	0.1785	0.1745	0.1679	0.1636	0.1617	0.2068	0.2038	0.2045	0.2090	0.2097	0.2226	0.2300	0.2172	0.1987	0.1990	0.1997	0.1918
	NO2	g/vehicle/km	0.0242	0.0232	0.0238	0.0241	0.0244	0.0295	0.0302	0.0268	0.0311	0.0298	0.0285	0.0278	0.0338	0.0324	0.0332	0.0343	0.0349	0.0377	0.0396	0.0377	0.0324	0.0299	0.0299	0.0291
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0081***	***0.0057***	***0.0040***	***0.0031***	***0.0026***	***0.0054***	***0.0120***	***0.0228***	***0.0338***	***0.0315***	***0.0281***	***0.0266***	***0.0369***	***0.0341***	***0.0362***	***0.0389***	***0.0408***	***0.0467***	***0.0509***	***0.0462***	***0.0347***	***0.0285***	***0.0268***	***0.0226***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.43E-03	3.78E-03	2.65E-03	2.09E-03	1.76E-03	3.59E-03	8.03E-03	1.52E-02	2.25E-02	2.10E-02	1.87E-02	1.77E-02	2.46E-02	2.27E-02	2.42E-02	2.59E-02	2.72E-02	3.11E-02	3.40E-02	3.08E-02	2.31E-02	1.90E-02	1.78E-02	1.51E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.72E-03	1.89E-03	1.33E-03	1.04E-03	8.81E-04	1.80E-03	4.02E-03	7.61E-03	1.13E-02	1.05E-02	9.37E-03	8.86E-03	1.23E-02	1.14E-02	1.21E-02	1.30E-02	1.36E-02	1.56E-02	1.70E-02	1.54E-02	1.16E-02	9.52E-03	8.92E-03	7.54E-03
	Emission in each Box of 1st jet	g/s	1.09E-03	7.56E-04	5.31E-04	4.17E-04	3.52E-04	7.19E-04	1.61E-03	3.04E-03	4.50E-03	4.20E-03	3.75E-03	3.54E-03	4.92E-03	4.54E-03	4.83E-03	5.18E-03	5.44E-03	6.22E-03	6.79E-03	6.16E-03	4.63E-03	3.81E-03	3.57E-03	3.02E-03
	Emission in each Box of 2nd jet	g/s	9.06E-04	6.30E-04	4.42E-04	3.48E-04	2.94E-04	5.99E-04	1.34E-03	2.54E-03	3.75E-03	3.50E-03	3.12E-03	2.95E-03	4.10E-03	3.78E-03	4.03E-03	4.32E-03	4.53E-03	5.19E-03	5.66E-03	5.13E-03	3.86E-03	3.17E-03	2.97E-03	2.51E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0034***	***0.0060***	***0.0056***	***0.0049***	***0.0046***	***0.0060***	***0.0054***	***0.0059***	***0.0064***	***0.0068***	***0.0079***	***0.0088***	***0.0080***	***0.0057***	***0.0043***	***0.0040***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.45E-04	7.40E-04	5.22E-04	3.91E-04	3.27E-04	4.64E-04	1.01E-03	2.28E-03	4.01E-03	3.73E-03	3.26E-03	3.05E-03	4.02E-03	3.61E-03	3.92E-03	4.25E-03	4.53E-03	5.28E-03	5.84E-03	5.35E-03	3.77E-03	2.86E-03	2.67E-03	2.29E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.73E-04	3.70E-04	2.61E-04	1.96E-04	1.64E-04	2.32E-04	5.04E-04	1.14E-03	2.01E-03	1.86E-03	1.63E-03	1.52E-03	2.01E-03	1.80E-03	1.96E-03	2.12E-03	2.27E-03	2.64E-03	2.92E-03	2.67E-03	1.89E-03	1.43E-03	1.34E-03	1.15E-03
	Emission in each Box of 1st jet	g/s	1.89E-04	1.48E-04	1.04E-04	7.83E-05	6.55E-05	9.28E-05	2.02E-04	4.57E-04	8.02E-04	7.45E-04	6.52E-04	6.09E-04	8.05E-04	7.21E-04	7.85E-04	8.50E-04	9.06E-04	1.06E-03	1.17E-03	1.07E-03	7.55E-04	5.72E-04	5.35E-04	4.58E-04
	Emission in each Box of 2nd jet	g/s	1.58E-04	1.23E-04	8.70E-05	6.52E-05	5.46E-05	7.73E-05	1.68E-04	3.81E-04	6.69E-04	6.21E-04	5.44E-04	5.08E-04	6.71E-04	6.01E-04	6.54E-04	7.08E-04	7.55E-04	8.79E-04	9.74E-04	8.91E-04	6.29E-04	4.77E-04	4.45E-04	3.82E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1452	0.1245	0.1271	0.1352	0.1373	0.2364	0.2487	0.1859	0.1806	0.1735	0.1690	0.1683	0.2136	0.2093	0.2102	0.2153	0.2174	0.2331	0.2381	0.2247	0.2058	0.2060	0.2071	0.1996
	NO2	g/vehicle/km	0.0250	0.0240	0.0246	0.0250	0.0252	0.0303	0.0310	0.0276	0.0318	0.0305	0.0291	0.0287	0.0346	0.0331	0.0339	0.0351	0.0360	0.0393	0.0407	0.0387	0.0333	0.0308	0.0308	0.0301
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0085***	***0.0060***	***0.0042***	***0.0033***	***0.0028***	***0.0056***	***0.0125***	***0.0238***	***0.0349***	***0.0326***	***0.0290***	***0.0277***	***0.0381***	***0.0350***	***0.0372***	***0.0400***	***0.0423***	***0.0489***	***0.0527***	***0.0477***	***0.0360***	***0.0295***	***0.0278***	***0.0236***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.67E-03	3.97E-03	2.79E-03	2.19E-03	1.85E-03	3.72E-03	8.31E-03	1.58E-02	2.33E-02	2.17E-02	1.94E-02	1.84E-02	2.54E-02	2.33E-02	2.48E-02	2.67E-02	2.82E-02	3.26E-02	3.51E-02	3.18E-02	2.40E-02	1.97E-02	1.85E-02	1.57E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.83E-03	1.98E-03	1.39E-03	1.10E-03	9.23E-04	1.86E-03	4.15E-03	7.92E-03	1.16E-02	1.09E-02	9.68E-03	9.22E-03	1.27E-02	1.17E-02	1.24E-02	1.33E-02	1.41E-02	1.63E-02	1.76E-02	1.59E-02	1.20E-02	9.85E-03	9.25E-03	7.85E-03
	Emission in each Box of 1st jet	g/s	1.13E-03	7.94E-04	5.57E-04	4.39E-04	3.69E-04	7.43E-04	1.66E-03	3.17E-03	4.66E-03	4.35E-03	3.87E-03	3.69E-03	5.08E-03	4.66E-03	4.97E-03	5.34E-03	5.64E-03	6.52E-03	7.03E-03	6.37E-03	4.79E-03	3.94E-03	3.70E-03	3.14E-03
	Emission in each Box of 2nd jet	g/s	9.45E-04	6.62E-04	4.65E-04	3.66E-04	3.08E-04	6.19E-04	1.38E-03	2.64E-03	3.88E-03	3.62E-03	3.23E-03	3.07E-03	4.24E-03	3.89E-03	4.14E-03	4.45E-03	4.70E-03	5.43E-03	5.86E-03	5.31E-03	4.00E-03	3.28E-03	3.08E-03	2.62E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0016***	***0.0035***	***0.0062***	***0.0057***	***0.0050***	***0.0047***	***0.0062***	***0.0055***	***0.0060***	***0.0065***	***0.0070***	***0.0082***	***0.0090***	***0.0082***	***0.0058***	***0.0044***	***0.0041***	***0.0036***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.77E-04	7.66E-04	5.40E-04	4.06E-04	3.38E-04	4.76E-04	1.03E-03	2.35E-03	4.10E-03	3.81E-03	3.34E-03	3.14E-03	4.12E-03	3.68E-03	4.01E-03	4.35E-03	4.67E-03	5.49E-03	6.00E-03	5.49E-03	3.88E-03	2.94E-03	2.75E-03	2.37E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.88E-04	3.83E-04	2.70E-04	2.03E-04	1.69E-04	2.38E-04	5.17E-04	1.18E-03	2.05E-03	1.91E-03	1.67E-03	1.57E-03	2.06E-03	1.84E-03	2.00E-03	2.18E-03	2.33E-03	2.74E-03	3.00E-03	2.74E-03	1.94E-03	1.47E-03	1.37E-03	1.18E-03
	Emission in each Box of 1st jet	g/s	1.95E-04	1.53E-04	1.08E-04	8.12E-05	6.76E-05	9.52E-05	2.07E-04	4.71E-04	8.21E-04	7.63E-04	6.68E-04	6.28E-04	8.25E-04	7.36E-04	8.02E-04	8.70E-04	9.34E-04	1.10E-03	1.20E-03	1.10E-03	7.76E-04	5.88E-04	5.50E-04	4.73E-04
	Emission in each Box of 2nd jet	g/s	1.63E-04	1.28E-04	9.00E-05	6.76E-05	5.64E-05	7.93E-05	1.72E-04	3.92E-04	6.84E-04	6.36E-04	5.56E-04	5.23E-04	6.87E-04	6.14E-04	6.68E-04	7.25E-04	7.78E-04	9.15E-04	1.00E-03	9.14E-04	6.47E-04	4.90E-04	4.58E-04	3.95E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1538	0.1318	0.1343	0.1400	0.1425	0.2594	0.2745	0.2096	0.2479	0.2290	0.2122	0.2074	0.1644	0.1606	0.1646	0.1736	0.1799	0.1912	0.2029	0.1928	0.1627	0.1482	0.1449	0.1419
	NO2	g/vehicle/km	0.0259	0.0249	0.0252	0.0256	0.0257	0.0320	0.0328	0.0307	0.0449	0.0412	0.0375	0.0361	0.0319	0.0308	0.0320	0.0340	0.0355	0.0381	0.0409	0.0389	0.0317	0.0276	0.0267	0.0262
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0174***	***0.0121***	***0.0085***	***0.0065***	***0.0056***	***0.0119***	***0.0268***	***0.0519***	***0.0925***	***0.0829***	***0.0703***	***0.0657***	***0.0476***	***0.0435***	***0.0474***	***0.0525***	***0.0570***	***0.0652***	***0.0733***	***0.0670***	***0.0462***	***0.0343***	***0.0314***	***0.0273***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.16E-02	8.08E-03	5.67E-03	4.36E-03	3.70E-03	7.93E-03	1.79E-02	3.46E-02	6.16E-02	5.53E-02	4.68E-02	4.38E-02	3.18E-02	2.90E-02	3.16E-02	3.50E-02	3.80E-02	4.35E-02	4.89E-02	4.47E-02	3.08E-02	2.28E-02	2.09E-02	1.82E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.78E-03	4.04E-03	2.83E-03	2.18E-03	1.85E-03	3.96E-03	8.94E-03	1.73E-02	3.08E-02	2.76E-02	2.34E-02	2.19E-02	1.59E-02	1.45E-02	1.58E-02	1.75E-02	1.90E-02	2.17E-02	2.44E-02	2.23E-02	1.54E-02	1.14E-02	1.05E-02	9.08E-03
	Emission in each Box of 1st jet	g/s	2.31E-03	1.62E-03	1.13E-03	8.72E-04	7.41E-04	1.59E-03	3.57E-03	6.91E-03	1.23E-02	1.11E-02	9.37E-03	8.77E-03	6.35E-03	5.80E-03	6.32E-03	7.00E-03	7.60E-03	8.70E-03	9.78E-03	8.93E-03	6.16E-03	4.57E-03	4.19E-03	3.63E-03
	Emission in each Box of 2nd jet	g/s	1.93E-03	1.35E-03	9.45E-04	7.26E-04	6.17E-04	1.32E-03	2.98E-03	5.76E-03	1.03E-02	9.21E-03	7.81E-03	7.31E-03	5.29E-03	4.83E-03	5.26E-03	5.83E-03	6.33E-03	7.25E-03	8.15E-03	7.44E-03	5.13E-03	3.81E-03	3.49E-03	3.03E-03
NO_2 Emission Rate		g/s	***0.0029***	***0.0023***	***0.0016***	***0.0012***	***0.0010***	***0.0015***	***0.0032***	***0.0076***	***0.0167***	***0.0149***	***0.0124***	***0.0115***	***0.0093***	***0.0083***	***0.0092***	***0.0103***	***0.0112***	***0.0130***	***0.0148***	***0.0135***	***0.0090***	***0.0064***	***0.0058***	***0.0050***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.95E-03	1.53E-03	1.06E-03	7.95E-04	6.68E-04	9.76E-04	2.13E-03	5.07E-03	1.12E-02	9.94E-03	8.29E-03	7.64E-03	6.17E-03	5.56E-03	6.14E-03	6.86E-03	7.50E-03	8.66E-03	9.86E-03	9.00E-03	6.00E-03	4.25E-03	3.86E-03	3.35E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.73E-04	7.64E-04	5.32E-04	3.98E-04	3.34E-04	4.88E-04	1.07E-03	2.54E-03	5.58E-03	4.97E-03	4.14E-03	3.82E-03	3.08E-03	2.78E-03	3.07E-03	3.43E-03	3.75E-03	4.33E-03	4.93E-03	4.50E-03	3.00E-03	2.12E-03	1.93E-03	1.68E-03
	Emission in each Box of 1st jet	g/s	3.89E-04	3.05E-04	2.13E-04	1.59E-04	1.34E-04	1.95E-04	4.27E-04	1.01E-03	2.23E-03	1.99E-03	1.66E-03	1.53E-03	1.23E-03	1.11E-03	1.23E-03	1.37E-03	1.50E-03	1.73E-03	1.97E-03	1.80E-03	1.20E-03	8.49E-04	7.71E-04	6.70E-04
	Emission in each Box of 2nd jet	g/s	3.24E-04	2.55E-04	1.77E-04	1.33E-04	1.11E-04	1.63E-04	3.55E-04	8.45E-04	1.86E-03	1.66E-03	1.38E-03	1.27E-03	1.03E-03	9.26E-04	1.02E-03	1.14E-03	1.25E-03	1.44E-03	1.64E-03	1.50E-03	1.00E-03	7.08E-04	6.43E-04	5.59E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1397	0.1190	0.1209	0.1267	0.1326	0.2452	0.2609	0.1969	0.2334	0.2184	0.2032	0.1975	0.1557	0.1500	0.1549	0.1638	0.1699	0.1784	0.1846	0.1752	0.1470	0.1341	0.1312	0.1282
	NO2	g/vehicle/km	0.0239	0.0230	0.0232	0.0237	0.0244	0.0305	0.0314	0.0293	0.0428	0.0398	0.0363	0.0348	0.0306	0.0292	0.0305	0.0326	0.0340	0.0360	0.0379	0.0359	0.0292	0.0254	0.0246	0.0242
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0158***	***0.0109***	***0.0076***	***0.0059***	***0.0052***	***0.0112***	***0.0255***	***0.0487***	***0.0871***	***0.0791***	***0.0673***	***0.0626***	***0.0451***	***0.0406***	***0.0446***	***0.0495***	***0.0538***	***0.0609***	***0.0667***	***0.0608***	***0.0417***	***0.0310***	***0.0285***	***0.0246***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.05E-02	7.29E-03	5.10E-03	3.94E-03	3.45E-03	7.49E-03	1.70E-02	3.25E-02	5.80E-02	5.27E-02	4.48E-02	4.17E-02	3.01E-02	2.71E-02	2.97E-02	3.30E-02	3.59E-02	4.06E-02	4.45E-02	4.06E-02	2.78E-02	2.07E-02	1.90E-02	1.64E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.25E-03	3.65E-03	2.55E-03	1.97E-03	1.72E-03	3.75E-03	8.49E-03	1.62E-02	2.90E-02	2.64E-02	2.24E-02	2.09E-02	1.50E-02	1.35E-02	1.49E-02	1.65E-02	1.79E-02	2.03E-02	2.22E-02	2.03E-02	1.39E-02	1.03E-02	9.48E-03	8.21E-03
	Emission in each Box of 1st jet	g/s	2.10E-03	1.46E-03	1.02E-03	7.89E-04	6.89E-04	1.50E-03	3.40E-03	6.50E-03	1.16E-02	1.05E-02	8.97E-03	8.35E-03	6.02E-03	5.42E-03	5.94E-03	6.60E-03	7.17E-03	8.12E-03	8.89E-03	8.11E-03	5.56E-03	4.13E-03	3.79E-03	3.28E-03
	Emission in each Box of 2nd jet	g/s	1.75E-03	1.22E-03	8.50E-04	6.57E-04	5.75E-04	1.25E-03	2.83E-03	5.41E-03	9.67E-03	8.79E-03	7.47E-03	6.96E-03	5.01E-03	4.51E-03	4.95E-03	5.50E-03	5.98E-03	6.77E-03	7.41E-03	6.76E-03	4.63E-03	3.45E-03	3.16E-03	2.74E-03
NO_2 Emission Rate		g/s	***0.0027***	***0.0021***	***0.0015***	***0.0011***	***0.0010***	***0.0014***	***0.0031***	***0.0072***	***0.0160***	***0.0144***	***0.0120***	***0.0110***	***0.0089***	***0.0079***	***0.0088***	***0.0099***	***0.0108***	***0.0123***	***0.0137***	***0.0125***	***0.0083***	***0.0059***	***0.0053***	***0.0046***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.80E-03	1.41E-03	9.79E-04	7.36E-04	6.35E-04	9.33E-04	2.04E-03	4.83E-03	1.07E-02	9.59E-03	8.01E-03	7.36E-03	5.91E-03	5.28E-03	5.86E-03	6.58E-03	7.17E-03	8.19E-03	9.13E-03	8.32E-03	5.52E-03	3.91E-03	3.56E-03	3.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.00E-04	7.06E-04	4.90E-04	3.68E-04	3.18E-04	4.66E-04	1.02E-03	2.42E-03	5.33E-03	4.80E-03	4.00E-03	3.68E-03	2.96E-03	2.64E-03	2.93E-03	3.29E-03	3.59E-03	4.09E-03	4.56E-03	4.16E-03	2.76E-03	1.96E-03	1.78E-03	1.55E-03
	Emission in each Box of 1st jet	g/s	3.60E-04	2.82E-04	1.96E-04	1.47E-04	1.27E-04	1.87E-04	4.09E-04	9.67E-04	2.13E-03	1.92E-03	1.60E-03	1.47E-03	1.18E-03	1.06E-03	1.17E-03	1.32E-03	1.43E-03	1.64E-03	1.83E-03	1.66E-03	1.10E-03	7.82E-04	7.13E-04	6.19E-04
	Emission in each Box of 2nd jet	g/s	3.00E-04	2.35E-04	1.63E-04	1.23E-04	1.06E-04	1.55E-04	3.41E-04	8.06E-04	1.78E-03	1.60E-03	1.33E-03	1.23E-03	9.85E-04	8.80E-04	9.76E-04	1.10E-03	1.20E-03	1.36E-03	1.52E-03	1.39E-03	9.19E-04	6.52E-04	5.94E-04	5.16E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1409	0.1189	0.1208	0.1268	0.1301	0.2391	0.2524	0.1938	0.2291	0.2119	0.1924	0.1874	0.1472	0.1439	0.1475	0.1560	0.1626	0.1725	0.1834	0.1752	0.1488	0.1344	0.1337	0.1312
	NO2	g/vehicle/km	0.0242	0.0230	0.0232	0.0238	0.0241	0.0299	0.0305	0.0288	0.0421	0.0387	0.0346	0.0333	0.0292	0.0282	0.0293	0.0313	0.0328	0.0350	0.0378	0.0360	0.0295	0.0255	0.0251	0.0247
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0159***	***0.0109***	***0.0076***	***0.0059***	***0.0051***	***0.0110***	***0.0247***	***0.0480***	***0.0854***	***0.0767***	***0.0637***	***0.0594***	***0.0427***	***0.0390***	***0.0424***	***0.0472***	***0.0515***	***0.0589***	***0.0663***	***0.0609***	***0.0422***	***0.0311***	***0.0290***	***0.0252***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.06E-02	7.28E-03	5.10E-03	3.95E-03	3.38E-03	7.31E-03	1.64E-02	3.20E-02	5.70E-02	5.11E-02	4.25E-02	3.96E-02	2.84E-02	2.60E-02	2.83E-02	3.15E-02	3.43E-02	3.93E-02	4.42E-02	4.06E-02	2.82E-02	2.07E-02	1.93E-02	1.68E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.30E-03	3.64E-03	2.55E-03	1.97E-03	1.69E-03	3.65E-03	8.22E-03	1.60E-02	2.85E-02	2.56E-02	2.12E-02	1.98E-02	1.42E-02	1.30E-02	1.41E-02	1.57E-02	1.72E-02	1.96E-02	2.21E-02	2.03E-02	1.41E-02	1.04E-02	9.66E-03	8.40E-03
	Emission in each Box of 1st jet	g/s	2.12E-03	1.46E-03	1.02E-03	7.89E-04	6.76E-04	1.46E-03	3.29E-03	6.39E-03	1.14E-02	1.02E-02	8.49E-03	7.92E-03	5.69E-03	5.20E-03	5.66E-03	6.29E-03	6.87E-03	7.85E-03	8.84E-03	8.11E-03	5.63E-03	4.14E-03	3.87E-03	3.36E-03
	Emission in each Box of 2nd jet	g/s	1.77E-03	1.21E-03	8.50E-04	6.58E-04	5.63E-04	1.22E-03	2.74E-03	5.33E-03	9.49E-03	8.52E-03	7.08E-03	6.60E-03	4.74E-03	4.33E-03	4.72E-03	5.24E-03	5.72E-03	6.54E-03	7.36E-03	6.76E-03	4.69E-03	3.45E-03	3.22E-03	2.80E-03
NO_2 Emission Rate		g/s	***0.0027***	***0.0021***	***0.0015***	***0.0011***	***0.0009***	***0.0014***	***0.0030***	***0.0071***	***0.0157***	***0.0140***	***0.0114***	***0.0105***	***0.0085***	***0.0076***	***0.0084***	***0.0095***	***0.0104***	***0.0120***	***0.0137***	***0.0125***	***0.0084***	***0.0059***	***0.0054***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.82E-03	1.41E-03	9.80E-04	7.40E-04	6.25E-04	9.12E-04	1.99E-03	4.76E-03	1.05E-02	9.33E-03	7.63E-03	7.03E-03	5.64E-03	5.10E-03	5.62E-03	6.31E-03	6.92E-03	7.97E-03	9.10E-03	8.34E-03	5.59E-03	3.93E-03	3.63E-03	3.16E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.09E-04	7.05E-04	4.90E-04	3.70E-04	3.13E-04	4.56E-04	9.93E-04	2.38E-03	5.24E-03	4.66E-03	3.81E-03	3.52E-03	2.82E-03	2.55E-03	2.81E-03	3.16E-03	3.46E-03	3.98E-03	4.55E-03	4.17E-03	2.79E-03	1.96E-03	1.81E-03	1.58E-03
	Emission in each Box of 1st jet	g/s	3.64E-04	2.82E-04	1.96E-04	1.48E-04	1.25E-04	1.82E-04	3.97E-04	9.51E-04	2.09E-03	1.87E-03	1.53E-03	1.41E-03	1.13E-03	1.02E-03	1.12E-03	1.26E-03	1.38E-03	1.59E-03	1.82E-03	1.67E-03	1.12E-03	7.86E-04	7.26E-04	6.33E-04
	Emission in each Box of 2nd jet	g/s	3.03E-04	2.35E-04	1.63E-04	1.23E-04	1.04E-04	1.52E-04	3.31E-04	7.93E-04	1.75E-03	1.55E-03	1.27E-03	1.17E-03	9.41E-04	8.49E-04	9.36E-04	1.05E-03	1.15E-03	1.33E-03	1.52E-03	1.39E-03	9.31E-04	6.55E-04	6.05E-04	5.27E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1292	0.1103	0.1133	0.1188	0.1220	0.2271	0.2437	0.1934	0.2276	0.2114	0.1949	0.1876	0.1451	0.1423	0.1441	0.1526	0.1595	0.1669	0.1749	0.1649	0.1386	0.1248	0.1215	0.1167
	NO2	g/vehicle/km	0.0224	0.0217	0.0221	0.0225	0.0228	0.0285	0.0296	0.0289	0.0420	0.0387	0.0351	0.0334	0.0289	0.0280	0.0288	0.0307	0.0323	0.0341	0.0363	0.0341	0.0278	0.0239	0.0231	0.0223
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0146***	***0.0101***	***0.0072***	***0.0055***	***0.0048***	***0.0104***	***0.0238***	***0.0479***	***0.0849***	***0.0765***	***0.0645***	***0.0595***	***0.0421***	***0.0385***	***0.0415***	***0.0461***	***0.0505***	***0.0569***	***0.0632***	***0.0573***	***0.0393***	***0.0289***	***0.0263***	***0.0224***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.71E-03	6.76E-03	4.78E-03	3.70E-03	3.17E-03	6.94E-03	1.59E-02	3.19E-02	5.66E-02	5.10E-02	4.30E-02	3.96E-02	2.80E-02	2.57E-02	2.76E-02	3.08E-02	3.37E-02	3.80E-02	4.21E-02	3.82E-02	2.62E-02	1.92E-02	1.76E-02	1.50E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.86E-03	3.38E-03	2.39E-03	1.85E-03	1.59E-03	3.47E-03	7.93E-03	1.60E-02	2.83E-02	2.55E-02	2.15E-02	1.98E-02	1.40E-02	1.28E-02	1.38E-02	1.54E-02	1.68E-02	1.90E-02	2.11E-02	1.91E-02	1.31E-02	9.62E-03	8.78E-03	7.48E-03
	Emission in each Box of 1st jet	g/s	1.94E-03	1.35E-03	9.56E-04	7.39E-04	6.34E-04	1.39E-03	3.17E-03	6.38E-03	1.13E-02	1.02E-02	8.60E-03	7.93E-03	5.61E-03	5.14E-03	5.53E-03	6.15E-03	6.73E-03	7.59E-03	8.43E-03	7.64E-03	5.24E-03	3.85E-03	3.51E-03	2.99E-03
	Emission in each Box of 2nd jet	g/s	1.62E-03	1.13E-03	7.97E-04	6.16E-04	5.29E-04	1.16E-03	2.64E-03	5.32E-03	9.43E-03	8.50E-03	7.17E-03	6.61E-03	4.67E-03	4.28E-03	4.61E-03	5.13E-03	5.61E-03	6.33E-03	7.02E-03	6.36E-03	4.37E-03	3.21E-03	2.93E-03	2.49E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0020***	***0.0014***	***0.0011***	***0.0009***	***0.0013***	***0.0029***	***0.0071***	***0.0156***	***0.0140***	***0.0116***	***0.0106***	***0.0084***	***0.0076***	***0.0083***	***0.0093***	***0.0102***	***0.0116***	***0.0131***	***0.0119***	***0.0079***	***0.0055***	***0.0050***	***0.0043***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.69E-03	1.33E-03	9.31E-04	7.01E-04	5.93E-04	8.71E-04	1.92E-03	4.77E-03	1.04E-02	9.35E-03	7.75E-03	7.07E-03	5.59E-03	5.06E-03	5.52E-03	6.19E-03	6.83E-03	7.76E-03	8.74E-03	7.90E-03	5.26E-03	3.69E-03	3.34E-03	2.86E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.43E-04	6.64E-04	4.65E-04	3.50E-04	2.96E-04	4.35E-04	9.62E-04	2.38E-03	5.22E-03	4.67E-03	3.87E-03	3.53E-03	2.79E-03	2.53E-03	2.76E-03	3.10E-03	3.41E-03	3.88E-03	4.37E-03	3.95E-03	2.63E-03	1.84E-03	1.67E-03	1.43E-03
	Emission in each Box of 1st jet	g/s	3.37E-04	2.66E-04	1.86E-04	1.40E-04	1.19E-04	1.74E-04	3.85E-04	9.53E-04	2.09E-03	1.87E-03	1.55E-03	1.41E-03	1.12E-03	1.01E-03	1.10E-03	1.24E-03	1.37E-03	1.55E-03	1.75E-03	1.58E-03	1.05E-03	7.38E-04	6.68E-04	5.72E-04
	Emission in each Box of 2nd jet	g/s	2.81E-04	2.21E-04	1.55E-04	1.17E-04	9.88E-05	1.45E-04	3.21E-04	7.94E-04	1.74E-03	1.56E-03	1.29E-03	1.18E-03	9.31E-04	8.43E-04	9.20E-04	1.03E-03	1.14E-03	1.29E-03	1.46E-03	1.32E-03	8.77E-04	6.15E-04	5.57E-04	4.76E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1243	0.1026	0.1037	0.1074	0.1100	0.2042	0.2159	0.1656	0.2005	0.1860	0.1735	0.1694	0.1330	0.1273	0.1325	0.1387	0.1428	0.1488	0.1565	0.1496	0.1269	0.1170	0.1149	0.1115
	NO2	g/vehicle/km	0.0216	0.0203	0.0204	0.0206	0.0208	0.0259	0.0264	0.0251	0.0374	0.0345	0.0316	0.0304	0.0267	0.0253	0.0266	0.0281	0.0292	0.0306	0.0327	0.0312	0.0257	0.0225	0.0219	0.0214
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0140***	***0.0094***	***0.0066***	***0.0050***	***0.0043***	***0.0094***	***0.0211***	***0.0410***	***0.0748***	***0.0673***	***0.0575***	***0.0537***	***0.0385***	***0.0345***	***0.0381***	***0.0419***	***0.0452***	***0.0508***	***0.0566***	***0.0520***	***0.0360***	***0.0271***	***0.0249***	***0.0214***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.35E-03	6.29E-03	4.38E-03	3.34E-03	2.86E-03	6.24E-03	1.41E-02	2.73E-02	4.98E-02	4.49E-02	3.83E-02	3.58E-02	2.57E-02	2.30E-02	2.54E-02	2.80E-02	3.01E-02	3.39E-02	3.77E-02	3.47E-02	2.40E-02	1.80E-02	1.66E-02	1.43E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.68E-03	3.14E-03	2.19E-03	1.67E-03	1.43E-03	3.12E-03	7.03E-03	1.37E-02	2.49E-02	2.24E-02	1.92E-02	1.79E-02	1.28E-02	1.15E-02	1.27E-02	1.40E-02	1.51E-02	1.69E-02	1.89E-02	1.73E-02	1.20E-02	9.02E-03	8.30E-03	7.14E-03
	Emission in each Box of 1st jet	g/s	1.87E-03	1.26E-03	8.75E-04	6.69E-04	5.72E-04	1.25E-03	2.81E-03	5.47E-03	9.97E-03	8.98E-03	7.66E-03	7.16E-03	5.14E-03	4.60E-03	5.08E-03	5.59E-03	6.03E-03	6.77E-03	7.54E-03	6.93E-03	4.80E-03	3.61E-03	3.32E-03	2.86E-03
	Emission in each Box of 2nd jet	g/s	1.56E-03	1.05E-03	7.29E-04	5.57E-04	4.76E-04	1.04E-03	2.34E-03	4.55E-03	8.31E-03	7.48E-03	6.38E-03	5.97E-03	4.28E-03	3.83E-03	4.24E-03	4.66E-03	5.02E-03	5.64E-03	6.28E-03	5.78E-03	4.00E-03	3.01E-03	2.77E-03	2.38E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0012***	***0.0026***	***0.0062***	***0.0139***	***0.0125***	***0.0105***	***0.0096***	***0.0077***	***0.0069***	***0.0077***	***0.0085***	***0.0092***	***0.0105***	***0.0118***	***0.0108***	***0.0073***	***0.0052***	***0.0048***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.63E-03	1.24E-03	8.61E-04	6.42E-04	5.42E-04	7.90E-04	1.72E-03	4.14E-03	9.29E-03	8.32E-03	6.98E-03	6.43E-03	5.16E-03	4.57E-03	5.11E-03	5.67E-03	6.15E-03	6.97E-03	7.89E-03	7.23E-03	4.85E-03	3.47E-03	3.17E-03	2.74E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.13E-04	6.22E-04	4.31E-04	3.21E-04	2.71E-04	3.95E-04	8.60E-04	2.07E-03	4.64E-03	4.16E-03	3.49E-03	3.22E-03	2.58E-03	2.28E-03	2.55E-03	2.84E-03	3.08E-03	3.49E-03	3.94E-03	3.61E-03	2.43E-03	1.74E-03	1.59E-03	1.37E-03
	Emission in each Box of 1st jet	g/s	3.25E-04	2.49E-04	1.72E-04	1.28E-04	1.08E-04	1.58E-04	3.44E-04	8.28E-04	1.86E-03	1.66E-03	1.40E-03	1.29E-03	1.03E-03	9.14E-04	1.02E-03	1.13E-03	1.23E-03	1.39E-03	1.58E-03	1.45E-03	9.71E-04	6.94E-04	6.34E-04	5.47E-04
	Emission in each Box of 2nd jet	g/s	2.71E-04	2.07E-04	1.44E-04	1.07E-04	9.03E-05	1.32E-04	2.87E-04	6.90E-04	1.55E-03	1.39E-03	1.16E-03	1.07E-03	8.60E-04	7.61E-04	8.51E-04	9.46E-04	1.03E-03	1.16E-03	1.31E-03	1.20E-03	8.09E-04	5.79E-04	5.29E-04	4.56E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1130	0.0970	0.1009	0.1036	0.1056	0.1949	0.2059	0.1632	0.1998	0.1832	0.1704	0.1633	0.1281	0.1276	0.1311	0.1384	0.1418	0.1508	0.1626	0.1520	0.1285	0.1173	0.1138	0.1130
	NO2	g/vehicle/km	0.0199	0.0194	0.0199	0.0200	0.0201	0.0248	0.0253	0.0247	0.0372	0.0340	0.0311	0.0294	0.0258	0.0254	0.0264	0.0281	0.0290	0.0311	0.0339	0.0317	0.0260	0.0226	0.0217	0.0216
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0127***	***0.0089***	***0.0064***	***0.0048***	***0.0041***	***0.0089***	***0.0201***	***0.0404***	***0.0745***	***0.0663***	***0.0564***	***0.0518***	***0.0371***	***0.0346***	***0.0377***	***0.0419***	***0.0449***	***0.0515***	***0.0588***	***0.0528***	***0.0365***	***0.0271***	***0.0247***	***0.0217***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.50E-03	5.94E-03	4.26E-03	3.22E-03	2.75E-03	5.96E-03	1.34E-02	2.69E-02	4.97E-02	4.42E-02	3.76E-02	3.45E-02	2.48E-02	2.30E-02	2.51E-02	2.79E-02	2.99E-02	3.43E-02	3.92E-02	3.52E-02	2.43E-02	1.81E-02	1.65E-02	1.45E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.25E-03	2.97E-03	2.13E-03	1.61E-03	1.37E-03	2.98E-03	6.70E-03	1.35E-02	2.48E-02	2.21E-02	1.88E-02	1.73E-02	1.24E-02	1.15E-02	1.26E-02	1.40E-02	1.50E-02	1.72E-02	1.96E-02	1.76E-02	1.22E-02	9.04E-03	8.23E-03	7.23E-03
	Emission in each Box of 1st jet	g/s	1.70E-03	1.19E-03	8.51E-04	6.45E-04	5.49E-04	1.19E-03	2.68E-03	5.38E-03	9.93E-03	8.84E-03	7.52E-03	6.90E-03	4.95E-03	4.61E-03	5.03E-03	5.58E-03	5.99E-03	6.86E-03	7.83E-03	7.04E-03	4.86E-03	3.61E-03	3.29E-03	2.89E-03
	Emission in each Box of 2nd jet	g/s	1.42E-03	9.90E-04	7.09E-04	5.37E-04	4.58E-04	9.93E-04	2.23E-03	4.49E-03	8.28E-03	7.37E-03	6.27E-03	5.75E-03	4.13E-03	3.84E-03	4.19E-03	4.65E-03	4.99E-03	5.72E-03	6.53E-03	5.87E-03	4.05E-03	3.01E-03	2.74E-03	2.41E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0018***	***0.0013***	***0.0009***	***0.0008***	***0.0011***	***0.0025***	***0.0061***	***0.0139***	***0.0123***	***0.0103***	***0.0093***	***0.0075***	***0.0069***	***0.0076***	***0.0085***	***0.0092***	***0.0106***	***0.0122***	***0.0110***	***0.0074***	***0.0052***	***0.0047***	***0.0042***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.49E-03	1.19E-03	8.41E-04	6.22E-04	5.23E-04	7.57E-04	1.65E-03	4.07E-03	9.26E-03	8.20E-03	6.86E-03	6.21E-03	4.99E-03	4.58E-03	5.06E-03	5.66E-03	6.11E-03	7.07E-03	8.16E-03	7.34E-03	4.91E-03	3.48E-03	3.14E-03	2.77E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.47E-04	5.93E-04	4.20E-04	3.11E-04	2.62E-04	3.79E-04	8.24E-04	2.04E-03	4.63E-03	4.10E-03	3.43E-03	3.10E-03	2.49E-03	2.29E-03	2.53E-03	2.83E-03	3.06E-03	3.54E-03	4.08E-03	3.67E-03	2.46E-03	1.74E-03	1.57E-03	1.39E-03
	Emission in each Box of 1st jet	g/s	2.99E-04	2.37E-04	1.68E-04	1.24E-04	1.05E-04	1.51E-04	3.30E-04	8.14E-04	1.85E-03	1.64E-03	1.37E-03	1.24E-03	9.98E-04	9.16E-04	1.01E-03	1.13E-03	1.22E-03	1.41E-03	1.63E-03	1.47E-03	9.82E-04	6.96E-04	6.29E-04	5.54E-04
	Emission in each Box of 2nd jet	g/s	2.49E-04	1.98E-04	1.40E-04	1.04E-04	8.72E-05	1.26E-04	2.75E-04	6.79E-04	1.54E-03	1.37E-03	1.14E-03	1.03E-03	8.32E-04	7.63E-04	8.43E-04	9.44E-04	1.02E-03	1.18E-03	1.36E-03	1.22E-03	8.18E-04	5.80E-04	5.24E-04	4.62E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1105	0.0936	0.0967	0.0991	0.0996	0.1900	0.1977	0.1556	0.1891	0.1833	0.1732	0.1714	0.1330	0.1297	0.1338	0.1424	0.1405	0.1488	0.1572	0.1460	0.1201	0.1096	0.1065	0.1026
	NO2	g/vehicle/km	0.0194	0.0187	0.0191	0.0192	0.0190	0.0241	0.0243	0.0236	0.0354	0.0340	0.0315	0.0308	0.0267	0.0257	0.0269	0.0289	0.0287	0.0307	0.0329	0.0305	0.0243	0.0212	0.0205	0.0198
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0125***	***0.0086***	***0.0061***	***0.0046***	***0.0039***	***0.0087***	***0.0193***	***0.0385***	***0.0705***	***0.0664***	***0.0573***	***0.0543***	***0.0385***	***0.0351***	***0.0385***	***0.0430***	***0.0445***	***0.0508***	***0.0568***	***0.0507***	***0.0341***	***0.0253***	***0.0231***	***0.0197***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.31E-03	5.73E-03	4.08E-03	3.08E-03	2.59E-03	5.80E-03	1.29E-02	2.57E-02	4.70E-02	4.42E-02	3.82E-02	3.62E-02	2.57E-02	2.34E-02	2.57E-02	2.87E-02	2.97E-02	3.38E-02	3.79E-02	3.38E-02	2.27E-02	1.69E-02	1.54E-02	1.31E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.16E-03	2.87E-03	2.04E-03	1.54E-03	1.29E-03	2.90E-03	6.44E-03	1.28E-02	2.35E-02	2.21E-02	1.91E-02	1.81E-02	1.28E-02	1.17E-02	1.28E-02	1.43E-02	1.48E-02	1.69E-02	1.89E-02	1.69E-02	1.14E-02	8.44E-03	7.70E-03	6.57E-03
	Emission in each Box of 1st jet	g/s	1.66E-03	1.15E-03	8.16E-04	6.17E-04	5.18E-04	1.16E-03	2.57E-03	5.13E-03	9.41E-03	8.85E-03	7.65E-03	7.24E-03	5.14E-03	4.68E-03	5.13E-03	5.74E-03	5.93E-03	6.77E-03	7.57E-03	6.76E-03	4.54E-03	3.38E-03	3.08E-03	2.63E-03
	Emission in each Box of 2nd jet	g/s	1.39E-03	9.56E-04	6.80E-04	5.14E-04	4.31E-04	9.67E-04	2.15E-03	4.28E-03	7.84E-03	7.37E-03	6.37E-03	6.04E-03	4.28E-03	3.90E-03	4.28E-03	4.78E-03	4.94E-03	5.64E-03	6.31E-03	5.64E-03	3.79E-03	2.81E-03	2.57E-03	2.19E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0007***	***0.0011***	***0.0024***	***0.0058***	***0.0132***	***0.0123***	***0.0104***	***0.0098***	***0.0077***	***0.0070***	***0.0077***	***0.0087***	***0.0091***	***0.0105***	***0.0119***	***0.0106***	***0.0069***	***0.0049***	***0.0044***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.46E-03	1.14E-03	8.07E-04	5.96E-04	4.95E-04	7.37E-04	1.58E-03	3.90E-03	8.80E-03	8.20E-03	6.96E-03	6.50E-03	5.16E-03	4.65E-03	5.15E-03	5.82E-03	6.06E-03	6.98E-03	7.92E-03	7.06E-03	4.60E-03	3.27E-03	2.96E-03	2.54E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.29E-04	5.72E-04	4.03E-04	2.98E-04	2.47E-04	3.68E-04	7.92E-04	1.95E-03	4.40E-03	4.10E-03	3.48E-03	3.25E-03	2.58E-03	2.32E-03	2.58E-03	2.91E-03	3.03E-03	3.49E-03	3.96E-03	3.53E-03	2.30E-03	1.64E-03	1.48E-03	1.27E-03
	Emission in each Box of 1st jet	g/s	2.91E-04	2.29E-04	1.61E-04	1.19E-04	9.89E-05	1.47E-04	3.17E-04	7.79E-04	1.76E-03	1.64E-03	1.39E-03	1.30E-03	1.03E-03	9.29E-04	1.03E-03	1.16E-03	1.21E-03	1.40E-03	1.58E-03	1.41E-03	9.21E-04	6.54E-04	5.93E-04	5.08E-04
	Emission in each Box of 2nd jet	g/s	2.43E-04	1.91E-04	1.34E-04	9.93E-05	8.24E-05	1.23E-04	2.64E-04	6.49E-04	1.47E-03	1.37E-03	1.16E-03	1.08E-03	8.60E-04	7.75E-04	8.59E-04	9.71E-04	1.01E-03	1.16E-03	1.32E-03	1.18E-03	7.67E-04	5.45E-04	4.94E-04	4.23E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1169	0.0962	0.1000	0.1045	0.1056	0.1941	0.2051	0.1548	0.1910	0.1796	0.1693	0.1640	0.1292	0.1295	0.1340	0.1405	0.1501	0.1560	0.1662	0.1546	0.1259	0.1112	0.1106	0.1081
	NO2	g/vehicle/km	0.0205	0.0192	0.0198	0.0201	0.0201	0.0247	0.0252	0.0235	0.0357	0.0334	0.0309	0.0295	0.0260	0.0257	0.0269	0.0285	0.0306	0.0321	0.0346	0.0322	0.0255	0.0215	0.0212	0.0208
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0132***	***0.0088***	***0.0063***	***0.0049***	***0.0041***	***0.0089***	***0.0200***	***0.0383***	***0.0712***	***0.0650***	***0.0561***	***0.0520***	***0.0375***	***0.0351***	***0.0386***	***0.0425***	***0.0475***	***0.0532***	***0.0601***	***0.0537***	***0.0357***	***0.0257***	***0.0240***	***0.0208***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.79E-03	5.89E-03	4.22E-03	3.25E-03	2.75E-03	5.93E-03	1.34E-02	2.55E-02	4.75E-02	4.33E-02	3.74E-02	3.47E-02	2.50E-02	2.34E-02	2.57E-02	2.83E-02	3.17E-02	3.55E-02	4.00E-02	3.58E-02	2.38E-02	1.71E-02	1.60E-02	1.38E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.40E-03	2.95E-03	2.11E-03	1.63E-03	1.37E-03	2.97E-03	6.68E-03	1.28E-02	2.37E-02	2.17E-02	1.87E-02	1.73E-02	1.25E-02	1.17E-02	1.29E-02	1.42E-02	1.58E-02	1.77E-02	2.00E-02	1.79E-02	1.19E-02	8.57E-03	7.99E-03	6.92E-03
	Emission in each Box of 1st jet	g/s	1.76E-03	1.18E-03	8.44E-04	6.50E-04	5.49E-04	1.19E-03	2.67E-03	5.11E-03	9.50E-03	8.67E-03	7.47E-03	6.93E-03	4.99E-03	4.67E-03	5.14E-03	5.66E-03	6.34E-03	7.10E-03	8.01E-03	7.16E-03	4.77E-03	3.43E-03	3.20E-03	2.77E-03
	Emission in each Box of 2nd jet	g/s	1.47E-03	9.82E-04	7.03E-04	5.42E-04	4.58E-04	9.88E-04	2.23E-03	4.26E-03	7.92E-03	7.22E-03	6.23E-03	5.78E-03	4.16E-03	3.90E-03	4.28E-03	4.72E-03	5.28E-03	5.91E-03	6.67E-03	5.97E-03	3.97E-03	2.86E-03	2.66E-03	2.31E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0013***	***0.0009***	***0.0008***	***0.0011***	***0.0025***	***0.0058***	***0.0133***	***0.0121***	***0.0102***	***0.0093***	***0.0075***	***0.0070***	***0.0077***	***0.0086***	***0.0097***	***0.0109***	***0.0125***	***0.0112***	***0.0072***	***0.0050***	***0.0046***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-03	1.18E-03	8.35E-04	6.26E-04	5.23E-04	7.54E-04	1.64E-03	3.88E-03	8.88E-03	8.05E-03	6.81E-03	6.23E-03	5.03E-03	4.64E-03	5.16E-03	5.74E-03	6.45E-03	7.29E-03	8.33E-03	7.46E-03	4.82E-03	3.32E-03	3.07E-03	2.66E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.70E-04	5.88E-04	4.17E-04	3.13E-04	2.62E-04	3.77E-04	8.20E-04	1.94E-03	4.44E-03	4.02E-03	3.41E-03	3.12E-03	2.51E-03	2.32E-03	2.58E-03	2.87E-03	3.23E-03	3.65E-03	4.17E-03	3.73E-03	2.41E-03	1.66E-03	1.53E-03	1.33E-03
	Emission in each Box of 1st jet	g/s	3.08E-04	2.35E-04	1.67E-04	1.25E-04	1.05E-04	1.51E-04	3.28E-04	7.76E-04	1.78E-03	1.61E-03	1.36E-03	1.25E-03	1.01E-03	9.28E-04	1.03E-03	1.15E-03	1.29E-03	1.46E-03	1.67E-03	1.49E-03	9.65E-04	6.64E-04	6.13E-04	5.33E-04
	Emission in each Box of 2nd jet	g/s	2.57E-04	1.96E-04	1.39E-04	1.04E-04	8.72E-05	1.26E-04	2.73E-04	6.47E-04	1.48E-03	1.34E-03	1.14E-03	1.04E-03	8.38E-04	7.74E-04	8.60E-04	9.56E-04	1.08E-03	1.22E-03	1.39E-03	1.24E-03	8.04E-04	5.53E-04	5.11E-04	4.44E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1161	0.0984	0.0986	0.1002	0.1051	0.1890	0.2006	0.1522	0.1827	0.1716	0.1678	0.1566	0.1271	0.1258	0.1330	0.1332	0.1349	0.1475	0.1586	0.1475	0.1258	0.1124	0.1103	0.1069
	NO2	g/vehicle/km	0.0203	0.0196	0.0195	0.0193	0.0200	0.0240	0.0246	0.0231	0.0343	0.0319	0.0306	0.0282	0.0256	0.0250	0.0267	0.0271	0.0277	0.0304	0.0331	0.0308	0.0255	0.0217	0.0212	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0131***	***0.0090***	***0.0062***	***0.0047***	***0.0041***	***0.0087***	***0.0196***	***0.0377***	***0.0682***	***0.0621***	***0.0556***	***0.0496***	***0.0368***	***0.0341***	***0.0383***	***0.0403***	***0.0427***	***0.0503***	***0.0573***	***0.0512***	***0.0357***	***0.0260***	***0.0239***	***0.0205***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.73E-03	6.03E-03	4.16E-03	3.12E-03	2.73E-03	5.78E-03	1.31E-02	2.51E-02	4.54E-02	4.14E-02	3.70E-02	3.31E-02	2.46E-02	2.27E-02	2.55E-02	2.68E-02	2.85E-02	3.36E-02	3.82E-02	3.42E-02	2.38E-02	1.73E-02	1.59E-02	1.37E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.37E-03	3.01E-03	2.08E-03	1.56E-03	1.37E-03	2.89E-03	6.53E-03	1.26E-02	2.27E-02	2.07E-02	1.85E-02	1.65E-02	1.23E-02	1.14E-02	1.28E-02	1.34E-02	1.42E-02	1.68E-02	1.91E-02	1.71E-02	1.19E-02	8.66E-03	7.97E-03	6.84E-03
	Emission in each Box of 1st jet	g/s	1.75E-03	1.21E-03	8.32E-04	6.23E-04	5.46E-04	1.16E-03	2.61E-03	5.02E-03	9.09E-03	8.28E-03	7.41E-03	6.62E-03	4.91E-03	4.54E-03	5.10E-03	5.37E-03	5.69E-03	6.71E-03	7.64E-03	6.83E-03	4.76E-03	3.46E-03	3.19E-03	2.74E-03
	Emission in each Box of 2nd jet	g/s	1.46E-03	1.00E-03	6.94E-04	5.19E-04	4.55E-04	9.63E-04	2.18E-03	4.19E-03	7.57E-03	6.90E-03	6.17E-03	5.51E-03	4.09E-03	3.78E-03	4.25E-03	4.47E-03	4.74E-03	5.59E-03	6.37E-03	5.69E-03	3.97E-03	2.89E-03	2.66E-03	2.28E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0024***	***0.0057***	***0.0128***	***0.0115***	***0.0101***	***0.0089***	***0.0074***	***0.0068***	***0.0077***	***0.0082***	***0.0088***	***0.0104***	***0.0120***	***0.0107***	***0.0072***	***0.0050***	***0.0046***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.53E-03	1.20E-03	8.24E-04	6.01E-04	5.20E-04	7.34E-04	1.60E-03	3.82E-03	8.53E-03	7.70E-03	6.76E-03	5.97E-03	4.95E-03	4.52E-03	5.13E-03	5.46E-03	5.84E-03	6.92E-03	7.98E-03	7.13E-03	4.82E-03	3.35E-03	3.06E-03	2.64E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.64E-04	6.00E-04	4.12E-04	3.00E-04	2.60E-04	3.67E-04	8.02E-04	1.91E-03	4.26E-03	3.85E-03	3.38E-03	2.98E-03	2.47E-03	2.26E-03	2.56E-03	2.73E-03	2.92E-03	3.46E-03	3.99E-03	3.57E-03	2.41E-03	1.67E-03	1.53E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	3.06E-04	2.40E-04	1.65E-04	1.20E-04	1.04E-04	1.47E-04	3.21E-04	7.64E-04	1.71E-03	1.54E-03	1.35E-03	1.19E-03	9.89E-04	9.03E-04	1.03E-03	1.09E-03	1.17E-03	1.38E-03	1.60E-03	1.43E-03	9.63E-04	6.69E-04	6.12E-04	5.27E-04
	Emission in each Box of 2nd jet	g/s	2.55E-04	2.00E-04	1.37E-04	1.00E-04	8.67E-05	1.22E-04	2.67E-04	6.36E-04	1.42E-03	1.28E-03	1.13E-03	9.94E-04	8.24E-04	7.53E-04	8.54E-04	9.10E-04	9.73E-04	1.15E-03	1.33E-03	1.19E-03	8.03E-04	5.58E-04	5.10E-04	4.39E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1327	0.1142	0.1151	0.1188	0.1221	0.2286	0.2401	0.1827	0.2185	0.2027	0.1881	0.1840	0.1458	0.1411	0.1438	0.1538	0.1562	0.1661	0.1786	0.1674	0.1422	0.1269	0.1259	0.1243
	NO2	g/vehicle/km	0.0229	0.0223	0.0223	0.0225	0.0228	0.0286	0.0291	0.0274	0.0404	0.0372	0.0340	0.0328	0.0290	0.0278	0.0287	0.0309	0.0316	0.0339	0.0369	0.0346	0.0284	0.0242	0.0238	0.0235
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0150***	***0.0105***	***0.0073***	***0.0055***	***0.0048***	***0.0105***	***0.0234***	***0.0452***	***0.0815***	***0.0734***	***0.0623***	***0.0583***	***0.0422***	***0.0382***	***0.0414***	***0.0465***	***0.0495***	***0.0567***	***0.0645***	***0.0581***	***0.0403***	***0.0293***	***0.0273***	***0.0239***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.98E-03	7.00E-03	4.86E-03	3.70E-03	3.17E-03	6.98E-03	1.56E-02	3.01E-02	5.43E-02	4.89E-02	4.15E-02	3.89E-02	2.82E-02	2.55E-02	2.76E-02	3.10E-02	3.30E-02	3.78E-02	4.30E-02	3.88E-02	2.69E-02	1.96E-02	1.82E-02	1.59E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.99E-03	3.50E-03	2.43E-03	1.85E-03	1.59E-03	3.49E-03	7.82E-03	1.51E-02	2.72E-02	2.45E-02	2.08E-02	1.94E-02	1.41E-02	1.27E-02	1.38E-02	1.55E-02	1.65E-02	1.89E-02	2.15E-02	1.94E-02	1.34E-02	9.78E-03	9.10E-03	7.96E-03
	Emission in each Box of 1st jet	g/s	2.00E-03	1.40E-03	9.71E-04	7.39E-04	6.35E-04	1.40E-03	3.13E-03	6.03E-03	1.09E-02	9.78E-03	8.31E-03	7.78E-03	5.63E-03	5.09E-03	5.52E-03	6.20E-03	6.60E-03	7.56E-03	8.60E-03	7.75E-03	5.38E-03	3.91E-03	3.64E-03	3.18E-03
	Emission in each Box of 2nd jet	g/s	1.66E-03	1.17E-03	8.09E-04	6.16E-04	5.29E-04	1.16E-03	2.61E-03	5.02E-03	9.05E-03	8.15E-03	6.92E-03	6.48E-03	4.69E-03	4.24E-03	4.60E-03	5.17E-03	5.50E-03	6.30E-03	7.17E-03	6.46E-03	4.48E-03	3.26E-03	3.03E-03	2.65E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0010***	***0.0009***	***0.0013***	***0.0028***	***0.0068***	***0.0151***	***0.0135***	***0.0113***	***0.0104***	***0.0084***	***0.0075***	***0.0083***	***0.0093***	***0.0100***	***0.0116***	***0.0133***	***0.0120***	***0.0081***	***0.0056***	***0.0052***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.72E-03	1.36E-03	9.43E-04	7.00E-04	5.92E-04	8.74E-04	1.90E-03	4.52E-03	1.00E-02	8.98E-03	7.51E-03	6.93E-03	5.60E-03	5.01E-03	5.50E-03	6.23E-03	6.68E-03	7.72E-03	8.88E-03	8.01E-03	5.37E-03	3.74E-03	3.44E-03	3.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.62E-04	6.82E-04	4.71E-04	3.50E-04	2.96E-04	4.37E-04	9.48E-04	2.26E-03	5.02E-03	4.49E-03	3.75E-03	3.47E-03	2.80E-03	2.51E-03	2.75E-03	3.11E-03	3.34E-03	3.86E-03	4.44E-03	4.01E-03	2.68E-03	1.87E-03	1.72E-03	1.51E-03
	Emission in each Box of 1st jet	g/s	3.45E-04	2.73E-04	1.89E-04	1.40E-04	1.18E-04	1.75E-04	3.79E-04	9.04E-04	2.01E-03	1.80E-03	1.50E-03	1.39E-03	1.12E-03	1.00E-03	1.10E-03	1.25E-03	1.34E-03	1.54E-03	1.78E-03	1.60E-03	1.07E-03	7.47E-04	6.88E-04	6.03E-04
	Emission in each Box of 2nd jet	g/s	2.87E-04	2.27E-04	1.57E-04	1.17E-04	9.87E-05	1.46E-04	3.16E-04	7.53E-04	1.67E-03	1.50E-03	1.25E-03	1.16E-03	9.34E-04	8.35E-04	9.17E-04	1.04E-03	1.11E-03	1.29E-03	1.48E-03	1.34E-03	8.95E-04	6.23E-04	5.73E-04	5.02E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1457	0.1228	0.1259	0.1306	0.1339	0.2477	0.2629	0.1980	0.2369	0.2191	0.2042	0.1967	0.1570	0.1534	0.1570	0.1650	0.1682	0.1777	0.1908	0.1822	0.1528	0.1393	0.1373	0.1349
	NO2	g/vehicle/km	0.0249	0.0238	0.0241	0.0244	0.0247	0.0308	0.0317	0.0295	0.0434	0.0399	0.0365	0.0348	0.0309	0.0298	0.0310	0.0329	0.0337	0.0360	0.0391	0.0373	0.0303	0.0263	0.0257	0.0253
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0164***	***0.0113***	***0.0080***	***0.0061***	***0.0052***	***0.0114***	***0.0257***	***0.0490***	***0.0884***	***0.0793***	***0.0676***	***0.0624***	***0.0455***	***0.0415***	***0.0452***	***0.0499***	***0.0533***	***0.0606***	***0.0690***	***0.0633***	***0.0434***	***0.0322***	***0.0298***	***0.0259***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.10E-02	7.53E-03	5.31E-03	4.07E-03	3.48E-03	7.57E-03	1.71E-02	3.27E-02	5.89E-02	5.29E-02	4.51E-02	4.16E-02	3.03E-02	2.77E-02	3.01E-02	3.33E-02	3.55E-02	4.04E-02	4.60E-02	4.22E-02	2.89E-02	2.15E-02	1.98E-02	1.73E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.48E-03	3.76E-03	2.66E-03	2.03E-03	1.74E-03	3.78E-03	8.56E-03	1.63E-02	2.95E-02	2.64E-02	2.25E-02	2.08E-02	1.52E-02	1.38E-02	1.51E-02	1.66E-02	1.78E-02	2.02E-02	2.30E-02	2.11E-02	1.45E-02	1.07E-02	9.92E-03	8.63E-03
	Emission in each Box of 1st jet	g/s	2.19E-03	1.51E-03	1.06E-03	8.13E-04	6.96E-04	1.51E-03	3.42E-03	6.53E-03	1.18E-02	1.06E-02	9.02E-03	8.31E-03	6.07E-03	5.54E-03	6.02E-03	6.65E-03	7.10E-03	8.08E-03	9.19E-03	8.44E-03	5.78E-03	4.29E-03	3.97E-03	3.45E-03
	Emission in each Box of 2nd jet	g/s	1.83E-03	1.25E-03	8.85E-04	6.78E-04	5.80E-04	1.26E-03	2.85E-03	5.44E-03	9.82E-03	8.81E-03	7.51E-03	6.93E-03	5.06E-03	4.62E-03	5.02E-03	5.54E-03	5.92E-03	6.74E-03	7.66E-03	7.03E-03	4.82E-03	3.58E-03	3.31E-03	2.88E-03
NO_2 Emission Rate		g/s	***0.0028***	***0.0022***	***0.0015***	***0.0011***	***0.0010***	***0.0014***	***0.0031***	***0.0073***	***0.0162***	***0.0144***	***0.0121***	***0.0110***	***0.0089***	***0.0081***	***0.0089***	***0.0099***	***0.0107***	***0.0123***	***0.0141***	***0.0129***	***0.0086***	***0.0061***	***0.0056***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.87E-03	1.46E-03	1.02E-03	7.59E-04	6.41E-04	9.42E-04	2.06E-03	4.87E-03	1.08E-02	9.63E-03	8.06E-03	7.34E-03	5.96E-03	5.38E-03	5.94E-03	6.63E-03	7.12E-03	8.18E-03	9.42E-03	8.63E-03	5.72E-03	4.05E-03	3.72E-03	3.24E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.35E-04	7.28E-04	5.08E-04	3.79E-04	3.21E-04	4.71E-04	1.03E-03	2.43E-03	5.39E-03	4.82E-03	4.03E-03	3.67E-03	2.98E-03	2.69E-03	2.97E-03	3.32E-03	3.56E-03	4.09E-03	4.71E-03	4.32E-03	2.86E-03	2.03E-03	1.86E-03	1.62E-03
	Emission in each Box of 1st jet	g/s	3.74E-04	2.91E-04	2.03E-04	1.52E-04	1.28E-04	1.88E-04	4.13E-04	9.74E-04	2.16E-03	1.93E-03	1.61E-03	1.47E-03	1.19E-03	1.08E-03	1.19E-03	1.33E-03	1.42E-03	1.64E-03	1.88E-03	1.73E-03	1.14E-03	8.10E-04	7.43E-04	6.47E-04
	Emission in each Box of 2nd jet	g/s	3.12E-04	2.43E-04	1.69E-04	1.26E-04	1.07E-04	1.57E-04	3.44E-04	8.12E-04	1.80E-03	1.61E-03	1.34E-03	1.22E-03	9.94E-04	8.97E-04	9.90E-04	1.11E-03	1.19E-03	1.36E-03	1.57E-03	1.44E-03	9.54E-04	6.75E-04	6.19E-04	5.39E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1519	0.1290	0.1322	0.1374	0.1401	0.2559	0.2716	0.2061	0.2448	0.2261	0.2107	0.2045	0.1626	0.1579	0.1617	0.1704	0.1748	0.1867	0.1980	0.1888	0.1588	0.1447	0.1430	0.1409
	NO2	g/vehicle/km	0.0257	0.0246	0.0249	0.0253	0.0255	0.0317	0.0325	0.0304	0.0444	0.0409	0.0373	0.0358	0.0317	0.0305	0.0316	0.0336	0.0348	0.0374	0.0402	0.0383	0.0311	0.0270	0.0264	0.0261
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0171***	***0.0119***	***0.0084***	***0.0064***	***0.0055***	***0.0117***	***0.0265***	***0.0510***	***0.0913***	***0.0819***	***0.0698***	***0.0648***	***0.0471***	***0.0428***	***0.0465***	***0.0515***	***0.0553***	***0.0637***	***0.0715***	***0.0656***	***0.0451***	***0.0334***	***0.0310***	***0.0271***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.14E-02	7.90E-03	5.58E-03	4.27E-03	3.64E-03	7.82E-03	1.77E-02	3.40E-02	6.09E-02	5.46E-02	4.65E-02	4.32E-02	3.14E-02	2.85E-02	3.10E-02	3.44E-02	3.69E-02	4.25E-02	4.77E-02	4.37E-02	3.00E-02	2.23E-02	2.07E-02	1.80E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.71E-03	3.95E-03	2.79E-03	2.14E-03	1.82E-03	3.91E-03	8.84E-03	1.70E-02	3.04E-02	2.73E-02	2.33E-02	2.16E-02	1.57E-02	1.43E-02	1.55E-02	1.72E-02	1.84E-02	2.12E-02	2.38E-02	2.19E-02	1.50E-02	1.11E-02	1.03E-02	9.02E-03
	Emission in each Box of 1st jet	g/s	2.29E-03	1.58E-03	1.12E-03	8.55E-04	7.28E-04	1.56E-03	3.54E-03	6.80E-03	1.22E-02	1.09E-02	9.30E-03	8.64E-03	6.28E-03	5.70E-03	6.20E-03	6.87E-03	7.38E-03	8.49E-03	9.54E-03	8.74E-03	6.01E-03	4.46E-03	4.13E-03	3.61E-03
	Emission in each Box of 2nd jet	g/s	1.90E-03	1.32E-03	9.29E-04	7.12E-04	6.07E-04	1.30E-03	2.95E-03	5.67E-03	1.01E-02	9.09E-03	7.75E-03	7.20E-03	5.24E-03	4.75E-03	5.17E-03	5.73E-03	6.15E-03	7.08E-03	7.95E-03	7.29E-03	5.01E-03	3.72E-03	3.45E-03	3.01E-03
NO_2 Emission Rate		g/s	***0.0029***	***0.0023***	***0.0016***	***0.0012***	***0.0010***	***0.0015***	***0.0032***	***0.0075***	***0.0166***	***0.0148***	***0.0124***	***0.0113***	***0.0092***	***0.0083***	***0.0091***	***0.0102***	***0.0110***	***0.0128***	***0.0145***	***0.0133***	***0.0088***	***0.0063***	***0.0057***	***0.0050***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.93E-03	1.51E-03	1.05E-03	7.86E-04	6.62E-04	9.67E-04	2.12E-03	5.02E-03	1.10E-02	9.86E-03	8.24E-03	7.56E-03	6.12E-03	5.50E-03	6.07E-03	6.78E-03	7.34E-03	8.51E-03	9.68E-03	8.86E-03	5.89E-03	4.17E-03	3.82E-03	3.34E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.66E-04	7.54E-04	5.26E-04	3.93E-04	3.31E-04	4.84E-04	1.06E-03	2.51E-03	5.52E-03	4.93E-03	4.12E-03	3.78E-03	3.06E-03	2.75E-03	3.03E-03	3.39E-03	3.67E-03	4.25E-03	4.84E-03	4.43E-03	2.94E-03	2.08E-03	1.91E-03	1.67E-03
	Emission in each Box of 1st jet	g/s	3.86E-04	3.01E-04	2.10E-04	1.57E-04	1.32E-04	1.93E-04	4.23E-04	1.00E-03	2.21E-03	1.97E-03	1.65E-03	1.51E-03	1.22E-03	1.10E-03	1.21E-03	1.36E-03	1.47E-03	1.70E-03	1.94E-03	1.77E-03	1.18E-03	8.34E-04	7.65E-04	6.69E-04
	Emission in each Box of 2nd jet	g/s	3.22E-04	2.51E-04	1.75E-04	1.31E-04	1.10E-04	1.61E-04	3.53E-04	8.36E-04	1.84E-03	1.64E-03	1.37E-03	1.26E-03	1.02E-03	9.17E-04	1.01E-03	1.13E-03	1.22E-03	1.42E-03	1.61E-03	1.48E-03	9.81E-04	6.95E-04	6.37E-04	5.57E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1538	0.1318	0.1343	0.1400	0.1425	0.2594	0.2745	0.2096	0.2479	0.2290	0.2122	0.2074	0.1644	0.1606	0.1646	0.1736	0.1799	0.1912	0.2029	0.1928	0.1627	0.1482	0.1449	0.1419
	NO2	g/vehicle/km	0.0259	0.0249	0.0252	0.0256	0.0257	0.0320	0.0328	0.0307	0.0449	0.0412	0.0375	0.0361	0.0319	0.0308	0.0320	0.0340	0.0355	0.0381	0.0409	0.0389	0.0317	0.0276	0.0267	0.0262
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0023***	***0.0016***	***0.0011***	***0.0009***	***0.0007***	***0.0017***	***0.0037***	***0.0069***	***0.0122***	***0.0109***	***0.0093***	***0.0087***	***0.0080***	***0.0073***	***0.0080***	***0.0088***	***0.0096***	***0.0109***	***0.0123***	***0.0112***	***0.0078***	***0.0058***	***0.0053***	***0.0046***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.52E-03	1.06E-03	7.42E-04	5.75E-04	4.87E-04	1.10E-03	2.49E-03	4.62E-03	8.14E-03	7.29E-03	6.19E-03	5.80E-03	5.33E-03	4.87E-03	5.30E-03	5.87E-03	6.37E-03	7.30E-03	8.19E-03	7.48E-03	5.17E-03	3.84E-03	3.52E-03	3.05E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	7.62E-04	5.28E-04	3.71E-04	2.88E-04	2.43E-04	5.50E-04	1.25E-03	2.31E-03	4.07E-03	3.64E-03	3.09E-03	2.90E-03	2.66E-03	2.44E-03	2.65E-03	2.94E-03	3.18E-03	3.65E-03	4.10E-03	3.74E-03	2.58E-03	1.92E-03	1.76E-03	1.52E-03
	Emission in each Box of 1st jet	g/s	1.91E-04	1.32E-04	9.27E-05	7.19E-05	6.09E-05	1.38E-04	3.12E-04	5.78E-04	1.02E-03	9.11E-04	7.74E-04	7.24E-04	6.66E-04	6.09E-04	6.63E-04	7.34E-04	7.96E-04	9.12E-04	1.02E-03	9.35E-04	6.46E-04	4.81E-04	4.41E-04	3.81E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.54E-05	5.30E-05	4.11E-05	3.48E-05	7.86E-05	1.78E-04	3.30E-04	5.81E-04	5.21E-04	4.42E-04	4.14E-04	3.81E-04	3.48E-04	3.79E-04	4.19E-04	4.55E-04	5.21E-04	5.85E-04	5.35E-04	3.69E-04	2.75E-04	2.52E-04	2.18E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0022***	***0.0020***	***0.0016***	***0.0015***	***0.0016***	***0.0014***	***0.0015***	***0.0017***	***0.0019***	***0.0022***	***0.0025***	***0.0023***	***0.0015***	***0.0011***	***0.0010***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.56E-04	2.00E-04	1.39E-04	1.05E-04	8.79E-05	1.36E-04	2.98E-04	6.78E-04	1.47E-03	1.31E-03	1.09E-03	1.01E-03	1.03E-03	9.34E-04	1.03E-03	1.15E-03	1.26E-03	1.45E-03	1.65E-03	1.51E-03	1.01E-03	7.15E-04	6.49E-04	5.62E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.28E-04	9.98E-05	6.96E-05	5.25E-05	4.39E-05	6.78E-05	1.49E-04	3.39E-04	7.37E-04	6.55E-04	5.47E-04	5.05E-04	5.17E-04	4.67E-04	5.15E-04	5.76E-04	6.28E-04	7.27E-04	8.27E-04	7.54E-04	5.04E-04	3.57E-04	3.24E-04	2.81E-04
	Emission in each Box of 1st jet	g/s	3.21E-05	2.50E-05	1.74E-05	1.31E-05	1.10E-05	1.69E-05	3.72E-05	8.48E-05	1.84E-04	1.64E-04	1.37E-04	1.26E-04	1.29E-04	1.17E-04	1.29E-04	1.44E-04	1.57E-04	1.82E-04	2.07E-04	1.89E-04	1.26E-04	8.93E-05	8.11E-05	7.03E-05
	Emission in each Box of 2nd jet	g/s	1.83E-05	1.43E-05	9.94E-06	7.50E-06	6.28E-06	9.68E-06	2.13E-05	4.84E-05	1.05E-04	9.36E-05	7.82E-05	7.21E-05	7.39E-05	6.67E-05	7.36E-05	8.23E-05	8.98E-05	1.04E-04	1.18E-04	1.08E-04	7.19E-05	5.11E-05	4.63E-05	4.02E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1397	0.1190	0.1209	0.1267	0.1326	0.2452	0.2609	0.1969	0.2334	0.2184	0.2032	0.1975	0.1557	0.1500	0.1549	0.1638	0.1699	0.1784	0.1846	0.1752	0.1470	0.1341	0.1312	0.1282
	NO2	g/vehicle/km	0.0239	0.0230	0.0232	0.0237	0.0244	0.0305	0.0314	0.0293	0.0428	0.0398	0.0363	0.0348	0.0306	0.0292	0.0305	0.0326	0.0340	0.0360	0.0379	0.0359	0.0292	0.0254	0.0246	0.0242
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0021***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0016***	***0.0036***	***0.0065***	***0.0115***	***0.0104***	***0.0089***	***0.0083***	***0.0076***	***0.0068***	***0.0075***	***0.0083***	***0.0090***	***0.0102***	***0.0112***	***0.0102***	***0.0070***	***0.0052***	***0.0048***	***0.0041***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.38E-03	9.54E-04	6.67E-04	5.20E-04	4.53E-04	1.04E-03	2.37E-03	4.34E-03	7.66E-03	6.95E-03	5.93E-03	5.52E-03	5.05E-03	4.55E-03	4.99E-03	5.54E-03	6.01E-03	6.81E-03	7.45E-03	6.80E-03	4.67E-03	3.48E-03	3.19E-03	2.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.92E-04	4.77E-04	3.34E-04	2.60E-04	2.27E-04	5.20E-04	1.19E-03	2.17E-03	3.83E-03	3.48E-03	2.96E-03	2.76E-03	2.52E-03	2.28E-03	2.49E-03	2.77E-03	3.01E-03	3.41E-03	3.73E-03	3.40E-03	2.33E-03	1.74E-03	1.60E-03	1.38E-03
	Emission in each Box of 1st jet	g/s	1.73E-04	1.19E-04	8.34E-05	6.51E-05	5.66E-05	1.30E-04	2.96E-04	5.43E-04	9.58E-04	8.69E-04	7.41E-04	6.90E-04	6.31E-04	5.69E-04	6.24E-04	6.93E-04	7.52E-04	8.51E-04	9.32E-04	8.50E-04	5.84E-04	4.35E-04	3.99E-04	3.44E-04
	Emission in each Box of 2nd jet	g/s	9.89E-05	6.81E-05	4.77E-05	3.72E-05	3.24E-05	7.43E-05	1.69E-04	3.10E-04	5.47E-04	4.97E-04	4.23E-04	3.94E-04	3.60E-04	3.25E-04	3.56E-04	3.96E-04	4.30E-04	4.86E-04	5.32E-04	4.86E-04	3.33E-04	2.49E-04	2.28E-04	1.97E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0021***	***0.0019***	***0.0016***	***0.0015***	***0.0015***	***0.0013***	***0.0015***	***0.0017***	***0.0018***	***0.0021***	***0.0023***	***0.0021***	***0.0014***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.37E-04	1.85E-04	1.28E-04	9.72E-05	8.35E-05	1.30E-04	2.85E-04	6.46E-04	1.41E-03	1.27E-03	1.06E-03	9.73E-04	9.92E-04	8.87E-04	9.83E-04	1.10E-03	1.20E-03	1.37E-03	1.53E-03	1.39E-03	9.26E-04	6.58E-04	5.99E-04	5.19E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.19E-04	9.23E-05	6.41E-05	4.86E-05	4.17E-05	6.48E-05	1.43E-04	3.23E-04	7.03E-04	6.33E-04	5.29E-04	4.86E-04	4.96E-04	4.44E-04	4.92E-04	5.52E-04	6.01E-04	6.87E-04	7.65E-04	6.97E-04	4.63E-04	3.29E-04	3.00E-04	2.59E-04
	Emission in each Box of 1st jet	g/s	2.97E-05	2.31E-05	1.60E-05	1.21E-05	1.04E-05	1.62E-05	3.57E-05	8.08E-05	1.76E-04	1.58E-04	1.32E-04	1.22E-04	1.24E-04	1.11E-04	1.23E-04	1.38E-04	1.50E-04	1.72E-04	1.91E-04	1.74E-04	1.16E-04	8.23E-05	7.49E-05	6.49E-05
	Emission in each Box of 2nd jet	g/s	1.70E-05	1.32E-05	9.15E-06	6.94E-06	5.96E-06	9.25E-06	2.04E-05	4.62E-05	1.00E-04	9.04E-05	7.56E-05	6.95E-05	7.08E-05	6.34E-05	7.02E-05	7.89E-05	8.59E-05	9.81E-05	1.09E-04	9.96E-05	6.62E-05	4.70E-05	4.28E-05	3.71E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1409	0.1189	0.1208	0.1268	0.1301	0.2391	0.2524	0.1938	0.2291	0.2119	0.1924	0.1874	0.1472	0.1439	0.1475	0.1560	0.1626	0.1725	0.1834	0.1752	0.1488	0.1344	0.1337	0.1312
	NO2	g/vehicle/km	0.0242	0.0230	0.0232	0.0238	0.0241	0.0299	0.0305	0.0288	0.0421	0.0387	0.0346	0.0333	0.0292	0.0282	0.0293	0.0313	0.0328	0.0350	0.0378	0.0360	0.0295	0.0255	0.0251	0.0247
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0021***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0015***	***0.0034***	***0.0064***	***0.0113***	***0.0101***	***0.0084***	***0.0079***	***0.0072***	***0.0066***	***0.0071***	***0.0079***	***0.0086***	***0.0099***	***0.0111***	***0.0102***	***0.0071***	***0.0052***	***0.0049***	***0.0042***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.40E-03	9.52E-04	6.67E-04	5.21E-04	4.44E-04	1.01E-03	2.29E-03	4.28E-03	7.52E-03	6.75E-03	5.61E-03	5.24E-03	4.77E-03	4.37E-03	4.75E-03	5.28E-03	5.76E-03	6.59E-03	7.41E-03	6.80E-03	4.73E-03	3.49E-03	3.25E-03	2.82E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.99E-04	4.76E-04	3.34E-04	2.60E-04	2.22E-04	5.07E-04	1.15E-03	2.14E-03	3.76E-03	3.37E-03	2.81E-03	2.62E-03	2.39E-03	2.18E-03	2.37E-03	2.64E-03	2.88E-03	3.29E-03	3.70E-03	3.40E-03	2.36E-03	1.74E-03	1.63E-03	1.41E-03
	Emission in each Box of 1st jet	g/s	1.75E-04	1.19E-04	8.34E-05	6.51E-05	5.55E-05	1.27E-04	2.87E-04	5.34E-04	9.40E-04	8.43E-04	7.01E-04	6.55E-04	5.97E-04	5.46E-04	5.94E-04	6.60E-04	7.19E-04	8.23E-04	9.26E-04	8.50E-04	5.91E-04	4.36E-04	4.06E-04	3.52E-04
	Emission in each Box of 2nd jet	g/s	9.98E-05	6.80E-05	4.76E-05	3.72E-05	3.17E-05	7.25E-05	1.64E-04	3.05E-04	5.37E-04	4.82E-04	4.01E-04	3.74E-04	3.41E-04	3.12E-04	3.39E-04	3.77E-04	4.11E-04	4.70E-04	5.29E-04	4.86E-04	3.38E-04	2.49E-04	2.32E-04	2.01E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0021***	***0.0018***	***0.0015***	***0.0014***	***0.0014***	***0.0013***	***0.0014***	***0.0016***	***0.0017***	***0.0020***	***0.0023***	***0.0021***	***0.0014***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.40E-04	1.84E-04	1.28E-04	9.76E-05	8.22E-05	1.27E-04	2.77E-04	6.36E-04	1.38E-03	1.23E-03	1.01E-03	9.30E-04	9.47E-04	8.57E-04	9.43E-04	1.06E-03	1.16E-03	1.34E-03	1.53E-03	1.40E-03	9.38E-04	6.61E-04	6.10E-04	5.30E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.20E-04	9.22E-05	6.41E-05	4.88E-05	4.11E-05	6.33E-05	1.39E-04	3.18E-04	6.91E-04	6.15E-04	5.04E-04	4.65E-04	4.73E-04	4.28E-04	4.71E-04	5.30E-04	5.80E-04	6.69E-04	7.63E-04	6.99E-04	4.69E-04	3.31E-04	3.05E-04	2.65E-04
	Emission in each Box of 1st jet	g/s	3.00E-05	2.31E-05	1.60E-05	1.22E-05	1.03E-05	1.58E-05	3.47E-05	7.95E-05	1.73E-04	1.54E-04	1.26E-04	1.16E-04	1.18E-04	1.07E-04	1.18E-04	1.32E-04	1.45E-04	1.67E-04	1.91E-04	1.75E-04	1.17E-04	8.27E-05	7.63E-05	6.63E-05
	Emission in each Box of 2nd jet	g/s	1.71E-05	1.32E-05	9.16E-06	6.97E-06	5.87E-06	9.05E-06	1.98E-05	4.54E-05	9.87E-05	8.79E-05	7.20E-05	6.64E-05	6.76E-05	6.12E-05	6.73E-05	7.57E-05	8.28E-05	9.55E-05	1.09E-04	9.98E-05	6.70E-05	4.72E-05	4.36E-05	3.79E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1292	0.1103	0.1133	0.1188	0.1220	0.2271	0.2437	0.1934	0.2276	0.2114	0.1949	0.1876	0.1451	0.1423	0.1441	0.1526	0.1595	0.1669	0.1749	0.1649	0.1386	0.1248	0.1215	0.1167
	NO2	g/vehicle/km	0.0224	0.0217	0.0221	0.0225	0.0228	0.0285	0.0296	0.0289	0.0420	0.0387	0.0351	0.0334	0.0289	0.0280	0.0288	0.0307	0.0323	0.0341	0.0363	0.0341	0.0278	0.0239	0.0231	0.0223
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0019***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0014***	***0.0033***	***0.0064***	***0.0112***	***0.0101***	***0.0085***	***0.0079***	***0.0071***	***0.0065***	***0.0070***	***0.0077***	***0.0085***	***0.0096***	***0.0106***	***0.0096***	***0.0066***	***0.0049***	***0.0044***	***0.0038***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.28E-03	8.84E-04	6.25E-04	4.88E-04	4.17E-04	9.63E-04	2.21E-03	4.27E-03	7.47E-03	6.73E-03	5.68E-03	5.24E-03	4.70E-03	4.32E-03	4.64E-03	5.16E-03	5.65E-03	6.37E-03	7.06E-03	6.40E-03	4.40E-03	3.24E-03	2.95E-03	2.51E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.40E-04	4.42E-04	3.13E-04	2.44E-04	2.08E-04	4.82E-04	1.11E-03	2.13E-03	3.73E-03	3.36E-03	2.84E-03	2.62E-03	2.35E-03	2.16E-03	2.32E-03	2.58E-03	2.82E-03	3.18E-03	3.53E-03	3.20E-03	2.20E-03	1.62E-03	1.48E-03	1.25E-03
	Emission in each Box of 1st jet	g/s	1.60E-04	1.10E-04	7.82E-05	6.10E-05	5.21E-05	1.20E-04	2.77E-04	5.33E-04	9.34E-04	8.41E-04	7.10E-04	6.55E-04	5.88E-04	5.40E-04	5.80E-04	6.45E-04	7.06E-04	7.96E-04	8.83E-04	8.00E-04	5.50E-04	4.05E-04	3.69E-04	3.13E-04
	Emission in each Box of 2nd jet	g/s	9.15E-05	6.31E-05	4.47E-05	3.48E-05	2.98E-05	6.88E-05	1.58E-04	3.05E-04	5.34E-04	4.81E-04	4.06E-04	3.74E-04	3.36E-04	3.08E-04	3.31E-04	3.69E-04	4.03E-04	4.55E-04	5.04E-04	4.57E-04	3.14E-04	2.31E-04	2.11E-04	1.79E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0021***	***0.0018***	***0.0015***	***0.0014***	***0.0014***	***0.0013***	***0.0014***	***0.0016***	***0.0017***	***0.0020***	***0.0022***	***0.0020***	***0.0013***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.22E-04	1.74E-04	1.22E-04	9.25E-05	7.79E-05	1.21E-04	2.69E-04	6.37E-04	1.38E-03	1.23E-03	1.02E-03	9.34E-04	9.37E-04	8.50E-04	9.27E-04	1.04E-03	1.14E-03	1.30E-03	1.46E-03	1.32E-03	8.83E-04	6.21E-04	5.62E-04	4.79E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.11E-04	8.68E-05	6.09E-05	4.62E-05	3.90E-05	6.04E-05	1.34E-04	3.19E-04	6.89E-04	6.16E-04	5.12E-04	4.67E-04	4.69E-04	4.25E-04	4.63E-04	5.20E-04	5.72E-04	6.51E-04	7.32E-04	6.62E-04	4.42E-04	3.10E-04	2.81E-04	2.40E-04
	Emission in each Box of 1st jet	g/s	2.78E-05	2.17E-05	1.52E-05	1.16E-05	9.74E-06	1.51E-05	3.36E-05	7.97E-05	1.72E-04	1.54E-04	1.28E-04	1.17E-04	1.17E-04	1.06E-04	1.16E-04	1.30E-04	1.43E-04	1.63E-04	1.83E-04	1.66E-04	1.10E-04	7.76E-05	7.03E-05	5.99E-05
	Emission in each Box of 2nd jet	g/s	1.59E-05	1.24E-05	8.70E-06	6.60E-06	5.57E-06	8.64E-06	1.92E-05	4.55E-05	9.84E-05	8.81E-05	7.31E-05	6.67E-05	6.69E-05	6.07E-05	6.62E-05	7.42E-05	8.18E-05	9.30E-05	1.05E-04	9.46E-05	6.31E-05	4.43E-05	4.02E-05	3.42E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1243	0.1026	0.1037	0.1074	0.1100	0.2042	0.2159	0.1656	0.2005	0.1860	0.1735	0.1694	0.1330	0.1273	0.1325	0.1387	0.1428	0.1488	0.1565	0.1496	0.1269	0.1170	0.1149	0.1115
	NO2	g/vehicle/km	0.0216	0.0203	0.0204	0.0206	0.0208	0.0259	0.0264	0.0251	0.0374	0.0345	0.0316	0.0304	0.0267	0.0253	0.0266	0.0281	0.0292	0.0306	0.0327	0.0312	0.0257	0.0225	0.0219	0.0214
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0018***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0029***	***0.0055***	***0.0099***	***0.0089***	***0.0076***	***0.0071***	***0.0065***	***0.0058***	***0.0064***	***0.0070***	***0.0076***	***0.0085***	***0.0095***	***0.0087***	***0.0060***	***0.0046***	***0.0042***	***0.0036***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.23E-03	8.22E-04	5.73E-04	4.41E-04	3.76E-04	8.66E-04	1.96E-03	3.65E-03	6.58E-03	5.92E-03	5.06E-03	4.73E-03	4.31E-03	3.86E-03	4.27E-03	4.69E-03	5.05E-03	5.68E-03	6.32E-03	5.81E-03	4.03E-03	3.04E-03	2.79E-03	2.39E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.16E-04	4.11E-04	2.86E-04	2.21E-04	1.88E-04	4.33E-04	9.81E-04	1.83E-03	3.29E-03	2.96E-03	2.53E-03	2.37E-03	2.16E-03	1.93E-03	2.13E-03	2.35E-03	2.53E-03	2.84E-03	3.16E-03	2.90E-03	2.02E-03	1.52E-03	1.40E-03	1.20E-03
	Emission in each Box of 1st jet	g/s	1.54E-04	1.03E-04	7.16E-05	5.52E-05	4.70E-05	1.08E-04	2.45E-04	4.57E-04	8.23E-04	7.40E-04	6.33E-04	5.92E-04	5.39E-04	4.83E-04	5.33E-04	5.87E-04	6.32E-04	7.10E-04	7.90E-04	7.26E-04	5.04E-04	3.79E-04	3.49E-04	2.99E-04
	Emission in each Box of 2nd jet	g/s	8.81E-05	5.87E-05	4.09E-05	3.15E-05	2.68E-05	6.19E-05	1.40E-04	2.61E-04	4.70E-04	4.23E-04	3.61E-04	3.38E-04	3.08E-04	2.76E-04	3.05E-04	3.35E-04	3.61E-04	4.06E-04	4.51E-04	4.15E-04	2.88E-04	2.17E-04	2.00E-04	1.71E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0018***	***0.0016***	***0.0014***	***0.0013***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0015***	***0.0018***	***0.0020***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.14E-04	1.63E-04	1.13E-04	8.47E-05	7.12E-05	1.10E-04	2.40E-04	5.54E-04	1.23E-03	1.10E-03	9.22E-04	8.50E-04	8.66E-04	7.68E-04	8.57E-04	9.52E-04	1.03E-03	1.17E-03	1.32E-03	1.21E-03	8.15E-04	5.84E-04	5.34E-04	4.59E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.07E-04	8.14E-05	5.64E-05	4.23E-05	3.56E-05	5.48E-05	1.20E-04	2.77E-04	6.13E-04	5.48E-04	4.61E-04	4.25E-04	4.33E-04	3.84E-04	4.28E-04	4.76E-04	5.16E-04	5.85E-04	6.61E-04	6.06E-04	4.07E-04	2.92E-04	2.67E-04	2.29E-04
	Emission in each Box of 1st jet	g/s	2.68E-05	2.03E-05	1.41E-05	1.06E-05	8.90E-06	1.37E-05	3.00E-05	6.92E-05	1.53E-04	1.37E-04	1.15E-04	1.06E-04	1.08E-04	9.60E-05	1.07E-04	1.19E-04	1.29E-04	1.46E-04	1.65E-04	1.51E-04	1.02E-04	7.30E-05	6.67E-05	5.74E-05
	Emission in each Box of 2nd jet	g/s	1.53E-05	1.16E-05	8.05E-06	6.05E-06	5.09E-06	7.83E-06	1.72E-05	3.96E-05	8.76E-05	7.83E-05	6.58E-05	6.07E-05	6.18E-05	5.49E-05	6.12E-05	6.80E-05	7.37E-05	8.36E-05	9.45E-05	8.65E-05	5.82E-05	4.17E-05	3.81E-05	3.28E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1130	0.0970	0.1009	0.1036	0.1056	0.1949	0.2059	0.1632	0.1998	0.1832	0.1704	0.1633	0.1281	0.1276	0.1311	0.1384	0.1418	0.1508	0.1626	0.1520	0.1285	0.1173	0.1138	0.1130
	NO2	g/vehicle/km	0.0199	0.0194	0.0199	0.0200	0.0201	0.0248	0.0253	0.0247	0.0372	0.0340	0.0311	0.0294	0.0258	0.0254	0.0264	0.0281	0.0290	0.0311	0.0339	0.0317	0.0260	0.0226	0.0217	0.0216
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0028***	***0.0054***	***0.0098***	***0.0087***	***0.0075***	***0.0068***	***0.0062***	***0.0058***	***0.0063***	***0.0070***	***0.0075***	***0.0086***	***0.0098***	***0.0088***	***0.0061***	***0.0046***	***0.0042***	***0.0036***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.12E-03	7.77E-04	5.57E-04	4.25E-04	3.61E-04	8.27E-04	1.87E-03	3.60E-03	6.56E-03	5.83E-03	4.97E-03	4.56E-03	4.15E-03	3.87E-03	4.22E-03	4.68E-03	5.02E-03	5.76E-03	6.57E-03	5.90E-03	4.08E-03	3.04E-03	2.77E-03	2.43E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.60E-04	3.89E-04	2.78E-04	2.13E-04	1.80E-04	4.13E-04	9.36E-04	1.80E-03	3.28E-03	2.92E-03	2.48E-03	2.28E-03	2.08E-03	1.94E-03	2.11E-03	2.34E-03	2.51E-03	2.88E-03	3.28E-03	2.95E-03	2.04E-03	1.52E-03	1.38E-03	1.21E-03
	Emission in each Box of 1st jet	g/s	1.40E-04	9.71E-05	6.96E-05	5.32E-05	4.51E-05	1.03E-04	2.34E-04	4.50E-04	8.20E-04	7.29E-04	6.21E-04	5.70E-04	5.19E-04	4.84E-04	5.28E-04	5.85E-04	6.27E-04	7.20E-04	8.21E-04	7.37E-04	5.10E-04	3.80E-04	3.46E-04	3.03E-04
	Emission in each Box of 2nd jet	g/s	8.00E-05	5.55E-05	3.98E-05	3.04E-05	2.58E-05	5.91E-05	1.34E-04	2.57E-04	4.68E-04	4.17E-04	3.55E-04	3.26E-04	2.97E-04	2.77E-04	3.01E-04	3.35E-04	3.59E-04	4.11E-04	4.69E-04	4.21E-04	2.92E-04	2.17E-04	1.98E-04	1.73E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0016***	***0.0014***	***0.0012***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0015***	***0.0018***	***0.0021***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.97E-04	1.55E-04	1.10E-04	8.20E-05	6.88E-05	1.05E-04	2.30E-04	5.45E-04	1.22E-03	1.08E-03	9.06E-04	8.21E-04	8.37E-04	7.70E-04	8.49E-04	9.50E-04	1.02E-03	1.19E-03	1.37E-03	1.23E-03	8.24E-04	5.86E-04	5.29E-04	4.65E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.84E-05	7.75E-05	5.50E-05	4.10E-05	3.44E-05	5.25E-05	1.15E-04	2.72E-04	6.11E-04	5.41E-04	4.53E-04	4.10E-04	4.19E-04	3.85E-04	4.25E-04	4.75E-04	5.12E-04	5.93E-04	6.84E-04	6.16E-04	4.12E-04	2.93E-04	2.64E-04	2.32E-04
	Emission in each Box of 1st jet	g/s	2.46E-05	1.94E-05	1.37E-05	1.03E-05	8.60E-06	1.31E-05	2.88E-05	6.81E-05	1.53E-04	1.35E-04	1.13E-04	1.03E-04	1.05E-04	9.62E-05	1.06E-04	1.19E-04	1.28E-04	1.48E-04	1.71E-04	1.54E-04	1.03E-04	7.32E-05	6.61E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	1.41E-05	1.11E-05	7.86E-06	5.86E-06	4.91E-06	7.51E-06	1.64E-05	3.89E-05	8.73E-05	7.72E-05	6.47E-05	5.86E-05	5.98E-05	5.50E-05	6.07E-05	6.79E-05	7.32E-05	8.47E-05	9.77E-05	8.79E-05	5.89E-05	4.18E-05	3.78E-05	3.32E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1105	0.0936	0.0967	0.0991	0.0996	0.1900	0.1977	0.1556	0.1891	0.1833	0.1732	0.1714	0.1330	0.1297	0.1338	0.1424	0.1405	0.1488	0.1572	0.1460	0.1201	0.1096	0.1065	0.1026
	NO2	g/vehicle/km	0.0194	0.0187	0.0191	0.0192	0.0190	0.0241	0.0243	0.0236	0.0354	0.0340	0.0315	0.0308	0.0267	0.0257	0.0269	0.0289	0.0287	0.0307	0.0329	0.0305	0.0243	0.0212	0.0205	0.0198
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0027***	***0.0051***	***0.0093***	***0.0088***	***0.0076***	***0.0072***	***0.0065***	***0.0059***	***0.0065***	***0.0072***	***0.0075***	***0.0085***	***0.0095***	***0.0085***	***0.0057***	***0.0043***	***0.0039***	***0.0033***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.10E-03	7.50E-04	5.34E-04	4.07E-04	3.40E-04	8.06E-04	1.80E-03	3.43E-03	6.21E-03	5.84E-03	5.05E-03	4.79E-03	4.31E-03	3.94E-03	4.31E-03	4.82E-03	4.97E-03	5.68E-03	6.35E-03	5.67E-03	3.81E-03	2.84E-03	2.59E-03	2.20E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.48E-04	3.75E-04	2.67E-04	2.04E-04	1.70E-04	4.03E-04	8.99E-04	1.72E-03	3.10E-03	2.92E-03	2.53E-03	2.39E-03	2.16E-03	1.97E-03	2.15E-03	2.41E-03	2.49E-03	2.84E-03	3.17E-03	2.83E-03	1.91E-03	1.42E-03	1.29E-03	1.10E-03
	Emission in each Box of 1st jet	g/s	1.37E-04	9.37E-05	6.67E-05	5.09E-05	4.25E-05	1.01E-04	2.25E-04	4.29E-04	7.76E-04	7.29E-04	6.31E-04	5.99E-04	5.39E-04	4.92E-04	5.38E-04	6.02E-04	6.22E-04	7.10E-04	7.93E-04	7.08E-04	4.77E-04	3.55E-04	3.24E-04	2.75E-04
	Emission in each Box of 2nd jet	g/s	7.83E-05	5.36E-05	3.81E-05	2.91E-05	2.43E-05	5.75E-05	1.28E-04	2.45E-04	4.43E-04	4.17E-04	3.61E-04	3.42E-04	3.08E-04	2.81E-04	3.08E-04	3.44E-04	3.55E-04	4.06E-04	4.53E-04	4.05E-04	2.72E-04	2.03E-04	1.85E-04	1.57E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0017***	***0.0016***	***0.0014***	***0.0013***	***0.0013***	***0.0012***	***0.0013***	***0.0015***	***0.0015***	***0.0018***	***0.0020***	***0.0018***	***0.0012***	***0.0008***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.92E-04	1.50E-04	1.06E-04	7.87E-05	6.50E-05	1.02E-04	2.21E-04	5.21E-04	1.16E-03	1.08E-03	9.19E-04	8.60E-04	8.66E-04	7.81E-04	8.65E-04	9.78E-04	1.02E-03	1.17E-03	1.33E-03	1.18E-03	7.73E-04	5.51E-04	4.99E-04	4.26E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.61E-05	7.49E-05	5.28E-05	3.93E-05	3.25E-05	5.12E-05	1.11E-04	2.61E-04	5.81E-04	5.41E-04	4.60E-04	4.30E-04	4.33E-04	3.91E-04	4.33E-04	4.89E-04	5.08E-04	5.86E-04	6.63E-04	5.92E-04	3.86E-04	2.75E-04	2.49E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.40E-05	1.87E-05	1.32E-05	9.83E-06	8.13E-06	1.28E-05	2.76E-05	6.52E-05	1.45E-04	1.35E-04	1.15E-04	1.07E-04	1.08E-04	9.77E-05	1.08E-04	1.22E-04	1.27E-04	1.46E-04	1.66E-04	1.48E-04	9.66E-05	6.88E-05	6.23E-05	5.33E-05
	Emission in each Box of 2nd jet	g/s	1.37E-05	1.07E-05	7.54E-06	5.62E-06	4.64E-06	7.31E-06	1.58E-05	3.72E-05	8.30E-05	7.72E-05	6.57E-05	6.14E-05	6.18E-05	5.58E-05	6.18E-05	6.98E-05	7.26E-05	8.37E-05	9.48E-05	8.46E-05	5.52E-05	3.93E-05	3.56E-05	3.04E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1169	0.0962	0.1000	0.1045	0.1056	0.1941	0.2051	0.1548	0.1910	0.1796	0.1693	0.1640	0.1292	0.1295	0.1340	0.1405	0.1501	0.1560	0.1662	0.1546	0.1259	0.1112	0.1106	0.1081
	NO2	g/vehicle/km	0.0205	0.0192	0.0198	0.0201	0.0201	0.0247	0.0252	0.0235	0.0357	0.0334	0.0309	0.0295	0.0260	0.0257	0.0269	0.0285	0.0306	0.0321	0.0346	0.0322	0.0255	0.0215	0.0212	0.0208
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0028***	***0.0051***	***0.0094***	***0.0086***	***0.0074***	***0.0069***	***0.0063***	***0.0059***	***0.0065***	***0.0071***	***0.0080***	***0.0089***	***0.0101***	***0.0090***	***0.0060***	***0.0043***	***0.0040***	***0.0035***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.16E-03	7.70E-04	5.52E-04	4.29E-04	3.61E-04	8.23E-04	1.86E-03	3.42E-03	6.27E-03	5.72E-03	4.94E-03	4.58E-03	4.19E-03	3.93E-03	4.31E-03	4.75E-03	5.31E-03	5.95E-03	6.71E-03	6.00E-03	4.00E-03	2.89E-03	2.69E-03	2.32E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.80E-04	3.85E-04	2.76E-04	2.15E-04	1.80E-04	4.12E-04	9.32E-04	1.71E-03	3.13E-03	2.86E-03	2.47E-03	2.29E-03	2.09E-03	1.96E-03	2.16E-03	2.38E-03	2.66E-03	2.98E-03	3.36E-03	3.00E-03	2.00E-03	1.44E-03	1.34E-03	1.16E-03
	Emission in each Box of 1st jet	g/s	1.45E-04	9.63E-05	6.90E-05	5.37E-05	4.51E-05	1.03E-04	2.33E-04	4.27E-04	7.84E-04	7.15E-04	6.17E-04	5.73E-04	5.24E-04	4.91E-04	5.39E-04	5.94E-04	6.64E-04	7.44E-04	8.39E-04	7.50E-04	5.00E-04	3.61E-04	3.36E-04	2.90E-04
	Emission in each Box of 2nd jet	g/s	8.28E-05	5.50E-05	3.94E-05	3.07E-05	2.58E-05	5.88E-05	1.33E-04	2.44E-04	4.48E-04	4.08E-04	3.53E-04	3.27E-04	2.99E-04	2.81E-04	3.08E-04	3.39E-04	3.79E-04	4.25E-04	4.79E-04	4.28E-04	2.86E-04	2.06E-04	1.92E-04	1.66E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0016***	***0.0014***	***0.0012***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0016***	***0.0018***	***0.0021***	***0.0019***	***0.0012***	***0.0008***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.03E-04	1.54E-04	1.09E-04	8.27E-05	6.88E-05	1.05E-04	2.29E-04	5.19E-04	1.17E-03	1.06E-03	9.00E-04	8.24E-04	8.43E-04	7.80E-04	8.66E-04	9.63E-04	1.08E-03	1.22E-03	1.40E-03	1.25E-03	8.10E-04	5.59E-04	5.16E-04	4.47E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.01E-04	7.70E-05	5.46E-05	4.13E-05	3.44E-05	5.23E-05	1.15E-04	2.60E-04	5.86E-04	5.31E-04	4.50E-04	4.12E-04	4.22E-04	3.90E-04	4.33E-04	4.82E-04	5.41E-04	6.12E-04	6.98E-04	6.25E-04	4.05E-04	2.79E-04	2.58E-04	2.23E-04
	Emission in each Box of 1st jet	g/s	2.54E-05	1.92E-05	1.37E-05	1.03E-05	8.60E-06	1.31E-05	2.86E-05	6.49E-05	1.47E-04	1.33E-04	1.13E-04	1.03E-04	1.05E-04	9.76E-05	1.08E-04	1.20E-04	1.35E-04	1.53E-04	1.75E-04	1.56E-04	1.01E-04	6.99E-05	6.45E-05	5.58E-05
	Emission in each Box of 2nd jet	g/s	1.45E-05	1.10E-05	7.80E-06	5.91E-06	4.91E-06	7.47E-06	1.64E-05	3.71E-05	8.37E-05	7.58E-05	6.43E-05	5.89E-05	6.02E-05	5.57E-05	6.19E-05	6.88E-05	7.73E-05	8.74E-05	9.97E-05	8.93E-05	5.78E-05	3.99E-05	3.69E-05	3.19E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1161	0.0984	0.0986	0.1002	0.1051	0.1890	0.2006	0.1522	0.1827	0.1716	0.1678	0.1566	0.1271	0.1258	0.1330	0.1332	0.1349	0.1475	0.1586	0.1475	0.1258	0.1124	0.1103	0.1069
	NO2	g/vehicle/km	0.0203	0.0196	0.0195	0.0193	0.0200	0.0240	0.0246	0.0231	0.0343	0.0319	0.0306	0.0282	0.0256	0.0250	0.0267	0.0271	0.0277	0.0304	0.0331	0.0308	0.0255	0.0217	0.0212	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0027***	***0.0050***	***0.0090***	***0.0082***	***0.0073***	***0.0066***	***0.0062***	***0.0057***	***0.0064***	***0.0068***	***0.0072***	***0.0084***	***0.0096***	***0.0086***	***0.0060***	***0.0044***	***0.0040***	***0.0034***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.15E-03	7.89E-04	5.44E-04	4.11E-04	3.59E-04	8.02E-04	1.82E-03	3.36E-03	6.00E-03	5.46E-03	4.89E-03	4.37E-03	4.12E-03	3.82E-03	4.28E-03	4.50E-03	4.77E-03	5.63E-03	6.40E-03	5.73E-03	4.00E-03	2.91E-03	2.68E-03	2.30E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.76E-04	3.94E-04	2.72E-04	2.06E-04	1.80E-04	4.01E-04	9.12E-04	1.68E-03	3.00E-03	2.73E-03	2.45E-03	2.19E-03	2.06E-03	1.91E-03	2.14E-03	2.25E-03	2.39E-03	2.81E-03	3.20E-03	2.86E-03	2.00E-03	1.46E-03	1.34E-03	1.15E-03
	Emission in each Box of 1st jet	g/s	1.44E-04	9.86E-05	6.81E-05	5.14E-05	4.49E-05	1.00E-04	2.28E-04	4.20E-04	7.50E-04	6.83E-04	6.12E-04	5.47E-04	5.15E-04	4.77E-04	5.35E-04	5.63E-04	5.97E-04	7.04E-04	8.00E-04	7.16E-04	5.00E-04	3.64E-04	3.35E-04	2.87E-04
	Emission in each Box of 2nd jet	g/s	8.22E-05	5.63E-05	3.89E-05	2.94E-05	2.56E-05	5.73E-05	1.30E-04	2.40E-04	4.28E-04	3.90E-04	3.50E-04	3.12E-04	2.94E-04	2.73E-04	3.06E-04	3.22E-04	3.41E-04	4.02E-04	4.57E-04	4.09E-04	2.85E-04	2.08E-04	1.92E-04	1.64E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0017***	***0.0015***	***0.0013***	***0.0012***	***0.0012***	***0.0011***	***0.0013***	***0.0014***	***0.0015***	***0.0017***	***0.0020***	***0.0018***	***0.0012***	***0.0008***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.02E-04	1.57E-04	1.08E-04	7.93E-05	6.84E-05	1.02E-04	2.24E-04	5.11E-04	1.13E-03	1.02E-03	8.93E-04	7.89E-04	8.30E-04	7.59E-04	8.60E-04	9.16E-04	9.79E-04	1.16E-03	1.34E-03	1.20E-03	8.08E-04	5.63E-04	5.14E-04	4.42E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.01E-04	7.85E-05	5.39E-05	3.97E-05	3.42E-05	5.09E-05	1.12E-04	2.55E-04	5.63E-04	5.08E-04	4.47E-04	3.94E-04	4.15E-04	3.80E-04	4.30E-04	4.58E-04	4.89E-04	5.80E-04	6.69E-04	5.98E-04	4.04E-04	2.82E-04	2.57E-04	2.21E-04
	Emission in each Box of 1st jet	g/s	2.52E-05	1.96E-05	1.35E-05	9.91E-06	8.55E-06	1.27E-05	2.80E-05	6.38E-05	1.41E-04	1.27E-04	1.12E-04	9.86E-05	1.04E-04	9.49E-05	1.08E-04	1.14E-04	1.22E-04	1.45E-04	1.67E-04	1.49E-04	1.01E-04	7.04E-05	6.43E-05	5.52E-05
	Emission in each Box of 2nd jet	g/s	1.44E-05	1.12E-05	7.70E-06	5.67E-06	4.88E-06	7.28E-06	1.60E-05	3.65E-05	8.04E-05	7.25E-05	6.38E-05	5.63E-05	5.93E-05	5.42E-05	6.14E-05	6.54E-05	6.99E-05	8.29E-05	9.56E-05	8.54E-05	5.77E-05	4.02E-05	3.67E-05	3.16E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1327	0.1142	0.1151	0.1188	0.1221	0.2286	0.2401	0.1827	0.2185	0.2027	0.1881	0.1840	0.1458	0.1411	0.1438	0.1538	0.1562	0.1661	0.1786	0.1674	0.1422	0.1269	0.1259	0.1243
	NO2	g/vehicle/km	0.0229	0.0223	0.0223	0.0225	0.0228	0.0286	0.0291	0.0274	0.0404	0.0372	0.0340	0.0328	0.0290	0.0278	0.0287	0.0309	0.0316	0.0339	0.0369	0.0346	0.0284	0.0242	0.0238	0.0235
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0020***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0015***	***0.0033***	***0.0060***	***0.0108***	***0.0097***	***0.0082***	***0.0077***	***0.0071***	***0.0064***	***0.0069***	***0.0078***	***0.0083***	***0.0095***	***0.0108***	***0.0097***	***0.0068***	***0.0049***	***0.0046***	***0.0040***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.32E-03	9.15E-04	6.35E-04	4.88E-04	4.17E-04	9.70E-04	2.18E-03	4.03E-03	7.17E-03	6.45E-03	5.49E-03	5.14E-03	4.72E-03	4.28E-03	4.63E-03	5.20E-03	5.53E-03	6.34E-03	7.21E-03	6.50E-03	4.52E-03	3.29E-03	3.06E-03	2.67E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.58E-04	4.57E-04	3.18E-04	2.44E-04	2.09E-04	4.85E-04	1.09E-03	2.02E-03	3.59E-03	3.23E-03	2.74E-03	2.57E-03	2.36E-03	2.14E-03	2.31E-03	2.60E-03	2.77E-03	3.17E-03	3.61E-03	3.25E-03	2.26E-03	1.65E-03	1.53E-03	1.33E-03
	Emission in each Box of 1st jet	g/s	1.64E-04	1.14E-04	7.94E-05	6.10E-05	5.22E-05	1.21E-04	2.73E-04	5.04E-04	8.96E-04	8.07E-04	6.86E-04	6.43E-04	5.91E-04	5.35E-04	5.79E-04	6.50E-04	6.91E-04	7.93E-04	9.01E-04	8.12E-04	5.64E-04	4.12E-04	3.83E-04	3.34E-04
	Emission in each Box of 2nd jet	g/s	9.40E-05	6.53E-05	4.54E-05	3.49E-05	2.98E-05	6.93E-05	1.56E-04	2.88E-04	5.12E-04	4.61E-04	3.92E-04	3.67E-04	3.37E-04	3.06E-04	3.31E-04	3.72E-04	3.95E-04	4.53E-04	5.15E-04	4.64E-04	3.23E-04	2.35E-04	2.19E-04	1.91E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0020***	***0.0018***	***0.0015***	***0.0014***	***0.0014***	***0.0013***	***0.0014***	***0.0016***	***0.0017***	***0.0019***	***0.0022***	***0.0020***	***0.0014***	***0.0009***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.27E-04	1.78E-04	1.23E-04	9.24E-05	7.79E-05	1.21E-04	2.65E-04	6.05E-04	1.32E-03	1.18E-03	9.92E-04	9.17E-04	9.40E-04	8.43E-04	9.23E-04	1.04E-03	1.12E-03	1.30E-03	1.49E-03	1.34E-03	9.01E-04	6.29E-04	5.79E-04	5.06E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.14E-04	8.92E-05	6.17E-05	4.62E-05	3.89E-05	6.07E-05	1.32E-04	3.02E-04	6.62E-04	5.92E-04	4.96E-04	4.58E-04	4.70E-04	4.21E-04	4.62E-04	5.22E-04	5.60E-04	6.48E-04	7.44E-04	6.72E-04	4.51E-04	3.14E-04	2.89E-04	2.53E-04
	Emission in each Box of 1st jet	g/s	2.84E-05	2.23E-05	1.54E-05	1.15E-05	9.73E-06	1.52E-05	3.31E-05	7.56E-05	1.66E-04	1.48E-04	1.24E-04	1.15E-04	1.18E-04	1.05E-04	1.15E-04	1.31E-04	1.40E-04	1.62E-04	1.86E-04	1.68E-04	1.13E-04	7.86E-05	7.24E-05	6.32E-05
	Emission in each Box of 2nd jet	g/s	1.62E-05	1.27E-05	8.81E-06	6.60E-06	5.56E-06	8.67E-06	1.89E-05	4.32E-05	9.46E-05	8.46E-05	7.08E-05	6.55E-05	6.71E-05	6.02E-05	6.59E-05	7.46E-05	7.99E-05	9.25E-05	1.06E-04	9.59E-05	6.44E-05	4.49E-05	4.13E-05	3.61E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1457	0.1228	0.1259	0.1306	0.1339	0.2477	0.2629	0.1980	0.2369	0.2191	0.2042	0.1967	0.1570	0.1534	0.1570	0.1650	0.1682	0.1777	0.1908	0.1822	0.1528	0.1393	0.1373	0.1349
	NO2	g/vehicle/km	0.0249	0.0238	0.0241	0.0244	0.0247	0.0308	0.0317	0.0295	0.0434	0.0399	0.0365	0.0348	0.0309	0.0298	0.0310	0.0329	0.0337	0.0360	0.0391	0.0373	0.0303	0.0263	0.0257	0.0253
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0022***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0016***	***0.0036***	***0.0066***	***0.0117***	***0.0105***	***0.0089***	***0.0082***	***0.0076***	***0.0070***	***0.0076***	***0.0084***	***0.0089***	***0.0102***	***0.0116***	***0.0106***	***0.0073***	***0.0054***	***0.0050***	***0.0043***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.44E-03	9.84E-04	6.95E-04	5.37E-04	4.57E-04	1.05E-03	2.39E-03	4.37E-03	7.78E-03	6.97E-03	5.96E-03	5.50E-03	5.09E-03	4.66E-03	5.05E-03	5.58E-03	5.95E-03	6.78E-03	7.71E-03	7.07E-03	4.85E-03	3.61E-03	3.34E-03	2.90E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	7.22E-04	4.92E-04	3.47E-04	2.68E-04	2.29E-04	5.25E-04	1.19E-03	2.18E-03	3.89E-03	3.49E-03	2.98E-03	2.75E-03	2.54E-03	2.33E-03	2.53E-03	2.79E-03	2.98E-03	3.39E-03	3.85E-03	3.54E-03	2.43E-03	1.81E-03	1.67E-03	1.45E-03
	Emission in each Box of 1st jet	g/s	1.81E-04	1.23E-04	8.69E-05	6.71E-05	5.72E-05	1.31E-04	2.99E-04	5.46E-04	9.72E-04	8.72E-04	7.45E-04	6.87E-04	6.36E-04	5.82E-04	6.32E-04	6.98E-04	7.44E-04	8.48E-04	9.63E-04	8.84E-04	6.07E-04	4.52E-04	4.17E-04	3.62E-04
	Emission in each Box of 2nd jet	g/s	1.03E-04	7.03E-05	4.96E-05	3.83E-05	3.27E-05	7.51E-05	1.71E-04	3.12E-04	5.55E-04	4.98E-04	4.25E-04	3.93E-04	3.63E-04	3.33E-04	3.61E-04	3.99E-04	4.25E-04	4.84E-04	5.50E-04	5.05E-04	3.47E-04	2.58E-04	2.39E-04	2.07E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0021***	***0.0019***	***0.0016***	***0.0015***	***0.0015***	***0.0014***	***0.0015***	***0.0017***	***0.0018***	***0.0021***	***0.0024***	***0.0022***	***0.0014***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.46E-04	1.90E-04	1.33E-04	1.00E-04	8.43E-05	1.31E-04	2.88E-04	6.51E-04	1.42E-03	1.27E-03	1.06E-03	9.71E-04	1.00E-03	9.05E-04	9.97E-04	1.11E-03	1.19E-03	1.37E-03	1.58E-03	1.45E-03	9.61E-04	6.82E-04	6.25E-04	5.43E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.23E-04	9.52E-05	6.65E-05	5.01E-05	4.22E-05	6.54E-05	1.44E-04	3.26E-04	7.12E-04	6.35E-04	5.32E-04	4.85E-04	5.00E-04	4.53E-04	4.98E-04	5.57E-04	5.97E-04	6.87E-04	7.89E-04	7.23E-04	4.81E-04	3.41E-04	3.13E-04	2.71E-04
	Emission in each Box of 1st jet	g/s	3.08E-05	2.38E-05	1.66E-05	1.25E-05	1.05E-05	1.64E-05	3.60E-05	8.14E-05	1.78E-04	1.59E-04	1.33E-04	1.21E-04	1.25E-04	1.13E-04	1.25E-04	1.39E-04	1.49E-04	1.72E-04	1.97E-04	1.81E-04	1.20E-04	8.52E-05	7.81E-05	6.79E-05
	Emission in each Box of 2nd jet	g/s	1.76E-05	1.36E-05	9.50E-06	7.15E-06	6.02E-06	9.34E-06	2.06E-05	4.65E-05	1.02E-04	9.07E-05	7.60E-05	6.94E-05	7.15E-05	6.47E-05	7.12E-05	7.95E-05	8.53E-05	9.81E-05	1.13E-04	1.03E-04	6.87E-05	4.87E-05	4.46E-05	3.88E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1519	0.1290	0.1322	0.1374	0.1401	0.2559	0.2716	0.2061	0.2448	0.2261	0.2107	0.2045	0.1626	0.1579	0.1617	0.1704	0.1748	0.1867	0.1980	0.1888	0.1588	0.1447	0.1430	0.1409
	NO2	g/vehicle/km	0.0257	0.0246	0.0249	0.0253	0.0255	0.0317	0.0325	0.0304	0.0444	0.0409	0.0373	0.0358	0.0317	0.0305	0.0316	0.0336	0.0348	0.0374	0.0402	0.0383	0.0311	0.0270	0.0264	0.0261
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0023***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0016***	***0.0037***	***0.0068***	***0.0121***	***0.0108***	***0.0092***	***0.0086***	***0.0079***	***0.0072***	***0.0078***	***0.0086***	***0.0093***	***0.0107***	***0.0120***	***0.0110***	***0.0076***	***0.0056***	***0.0052***	***0.0045***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.51E-03	1.03E-03	7.30E-04	5.64E-04	4.79E-04	1.09E-03	2.47E-03	4.55E-03	8.03E-03	7.20E-03	6.15E-03	5.71E-03	5.27E-03	4.79E-03	5.21E-03	5.77E-03	6.19E-03	7.13E-03	7.99E-03	7.33E-03	5.04E-03	3.75E-03	3.48E-03	3.03E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	7.53E-04	5.17E-04	3.65E-04	2.82E-04	2.39E-04	5.43E-04	1.23E-03	2.27E-03	4.02E-03	3.60E-03	3.07E-03	2.86E-03	2.64E-03	2.40E-03	2.60E-03	2.88E-03	3.09E-03	3.56E-03	4.00E-03	3.66E-03	2.52E-03	1.88E-03	1.74E-03	1.51E-03
	Emission in each Box of 1st jet	g/s	1.88E-04	1.29E-04	9.12E-05	7.05E-05	5.98E-05	1.36E-04	3.09E-04	5.68E-04	1.00E-03	9.00E-04	7.68E-04	7.14E-04	6.59E-04	5.99E-04	6.51E-04	7.21E-04	7.73E-04	8.91E-04	9.99E-04	9.16E-04	6.30E-04	4.69E-04	4.35E-04	3.78E-04
	Emission in each Box of 2nd jet	g/s	1.08E-04	7.38E-05	5.21E-05	4.03E-05	3.42E-05	7.75E-05	1.76E-04	3.25E-04	5.74E-04	5.14E-04	4.39E-04	4.08E-04	3.76E-04	3.42E-04	3.72E-04	4.12E-04	4.42E-04	5.09E-04	5.71E-04	5.23E-04	3.60E-04	2.68E-04	2.48E-04	2.16E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0022***	***0.0020***	***0.0016***	***0.0015***	***0.0015***	***0.0014***	***0.0015***	***0.0017***	***0.0018***	***0.0021***	***0.0024***	***0.0022***	***0.0015***	***0.0011***	***0.0010***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.55E-04	1.97E-04	1.38E-04	1.04E-04	8.71E-05	1.34E-04	2.95E-04	6.71E-04	1.46E-03	1.30E-03	1.09E-03	1.00E-03	1.03E-03	9.25E-04	1.02E-03	1.14E-03	1.23E-03	1.43E-03	1.62E-03	1.48E-03	9.88E-04	7.01E-04	6.43E-04	5.61E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.27E-04	9.86E-05	6.88E-05	5.19E-05	4.35E-05	6.71E-05	1.48E-04	3.35E-04	7.29E-04	6.50E-04	5.45E-04	5.00E-04	5.13E-04	4.62E-04	5.09E-04	5.69E-04	6.15E-04	7.14E-04	8.11E-04	7.42E-04	4.94E-04	3.51E-04	3.22E-04	2.80E-04
	Emission in each Box of 1st jet	g/s	3.18E-05	2.46E-05	1.72E-05	1.30E-05	1.09E-05	1.68E-05	3.69E-05	8.38E-05	1.82E-04	1.63E-04	1.36E-04	1.25E-04	1.28E-04	1.16E-04	1.27E-04	1.42E-04	1.54E-04	1.78E-04	2.03E-04	1.86E-04	1.24E-04	8.77E-05	8.04E-05	7.01E-05
	Emission in each Box of 2nd jet	g/s	1.82E-05	1.41E-05	9.83E-06	7.41E-06	6.22E-06	9.59E-06	2.11E-05	4.79E-05	1.04E-04	9.29E-05	7.78E-05	7.14E-05	7.33E-05	6.60E-05	7.28E-05	8.13E-05	8.79E-05	1.02E-04	1.16E-04	1.06E-04	7.06E-05	5.01E-05	4.59E-05	4.01E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section 104C01-104C20
Enclosure Involvec 104P3
Road Located 089
Vehicle EF Adopte 104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1538	0.1318	0.1343	0.1400	0.1425	0.2594	0.2745	0.2096	0.2479	0.2290	0.2122	0.2074	0.1644	0.1606	0.1646	0.1736	0.1799	0.1912	0.2029	0.1928	0.1627	0.1482	0.1449	0.1419
	NO2	g/vehicle/km	0.0259	0.0249	0.0252	0.0256	0.0257	0.0320	0.0328	0.0307	0.0449	0.0412	0.0375	0.0361	0.0319	0.0308	0.0320	0.0340	0.0355	0.0381	0.0409	0.0389	0.0317	0.0276	0.0267	0.0262
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0019***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0030***	***0.0058***	***0.0103***	***0.0093***	***0.0078***	***0.0073***	***0.0048***	***0.0044***	***0.0048***	***0.0053***	***0.0058***	***0.0066***	***0.0074***	***0.0068***	***0.0047***	***0.0035***	***0.0032***	***0.0028***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.30E-03	9.05E-04	6.29E-04	4.88E-04	4.10E-04	8.73E-04	1.99E-03	3.86E-03	6.88E-03	6.18E-03	5.23E-03	4.89E-03	3.23E-03	2.95E-03	3.21E-03	3.56E-03	3.86E-03	4.42E-03	4.96E-03	4.52E-03	3.13E-03	2.33E-03	2.13E-03	1.84E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.49E-04	4.53E-04	3.14E-04	2.44E-04	2.05E-04	4.37E-04	9.93E-04	1.93E-03	3.44E-03	3.09E-03	2.61E-03	2.45E-03	1.61E-03	1.48E-03	1.61E-03	1.78E-03	1.93E-03	2.21E-03	2.48E-03	2.26E-03	1.57E-03	1.17E-03	1.07E-03	9.22E-04
	Emission in each Box of 1st jet	g/s	1.30E-04	9.05E-05	6.29E-05	4.88E-05	4.10E-05	8.73E-05	1.99E-04	3.86E-04	6.88E-04	6.18E-04	5.23E-04	4.89E-04	3.23E-04	2.95E-04	3.21E-04	3.56E-04	3.86E-04	4.42E-04	4.96E-04	4.52E-04	3.13E-04	2.33E-04	2.13E-04	1.84E-04
	Emission in each Box of 2nd jet	g/s	6.49E-05	4.53E-05	3.14E-05	2.44E-05	2.05E-05	4.37E-05	9.93E-05	1.93E-04	3.44E-04	3.09E-04	2.61E-04	2.45E-04	1.61E-04	1.48E-04	1.61E-04	1.78E-04	1.93E-04	2.21E-04	2.48E-04	2.26E-04	1.57E-04	1.17E-04	1.07E-04	9.22E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0019***	***0.0017***	***0.0014***	***0.0013***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0015***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.18E-04	1.71E-04	1.18E-04	8.90E-05	7.40E-05	1.08E-04	2.37E-04	5.67E-04	1.25E-03	1.11E-03	9.25E-04	8.53E-04	6.27E-04	5.66E-04	6.24E-04	6.97E-04	7.61E-04	8.80E-04	1.00E-03	9.12E-04	6.10E-04	4.34E-04	3.93E-04	3.40E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.09E-04	8.56E-05	5.90E-05	4.45E-05	3.70E-05	5.38E-05	1.19E-04	2.83E-04	6.23E-04	5.56E-04	4.62E-04	4.26E-04	3.13E-04	2.83E-04	3.12E-04	3.49E-04	3.81E-04	4.40E-04	5.00E-04	4.56E-04	3.05E-04	2.17E-04	1.96E-04	1.70E-04
	Emission in each Box of 1st jet	g/s	2.18E-05	1.71E-05	1.18E-05	8.90E-06	7.40E-06	1.08E-05	2.37E-05	5.67E-05	1.25E-04	1.11E-04	9.25E-05	8.53E-05	6.27E-05	5.66E-05	6.24E-05	6.97E-05	7.61E-05	8.80E-05	1.00E-04	9.12E-05	6.10E-05	4.34E-05	3.93E-05	3.40E-05
	Emission in each Box of 2nd jet	g/s	1.09E-05	8.56E-06	5.90E-06	4.45E-06	3.70E-06	5.38E-06	1.19E-05	2.83E-05	6.23E-05	5.56E-05	4.62E-05	4.26E-05	3.13E-05	2.83E-05	3.12E-05	3.49E-05	3.81E-05	4.40E-05	5.00E-05	4.56E-05	3.05E-05	2.17E-05	1.96E-05	1.70E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1397	0.1190	0.1209	0.1267	0.1326	0.2452	0.2609	0.1969	0.2334	0.2184	0.2032	0.1975	0.1557	0.1500	0.1549	0.1638	0.1699	0.1784	0.1846	0.1752	0.1470	0.1341	0.1312	0.1282
	NO2	g/vehicle/km	0.0239	0.0230	0.0232	0.0237	0.0244	0.0305	0.0314	0.0293	0.0428	0.0398	0.0363	0.0348	0.0306	0.0292	0.0305	0.0326	0.0340	0.0360	0.0379	0.0359	0.0292	0.0254	0.0246	0.0242
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0018***	***0.0012***	***0.0008***	***0.0007***	***0.0006***	***0.0012***	***0.0028***	***0.0054***	***0.0097***	***0.0088***	***0.0075***	***0.0070***	***0.0046***	***0.0041***	***0.0045***	***0.0050***	***0.0055***	***0.0062***	***0.0068***	***0.0062***	***0.0042***	***0.0032***	***0.0029***	***0.0025***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.18E-03	8.17E-04	5.65E-04	4.41E-04	3.82E-04	8.25E-04	1.89E-03	3.63E-03	6.48E-03	5.89E-03	5.01E-03	4.66E-03	3.06E-03	2.76E-03	3.02E-03	3.36E-03	3.64E-03	4.12E-03	4.51E-03	4.11E-03	2.83E-03	2.11E-03	1.93E-03	1.67E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.89E-04	4.09E-04	2.83E-04	2.21E-04	1.91E-04	4.13E-04	9.44E-04	1.81E-03	3.24E-03	2.95E-03	2.50E-03	2.33E-03	1.53E-03	1.38E-03	1.51E-03	1.68E-03	1.82E-03	2.06E-03	2.25E-03	2.05E-03	1.41E-03	1.06E-03	9.66E-04	8.33E-04
	Emission in each Box of 1st jet	g/s	1.18E-04	8.17E-05	5.65E-05	4.41E-05	3.82E-05	8.25E-05	1.89E-04	3.63E-04	6.48E-04	5.89E-04	5.01E-04	4.66E-04	3.06E-04	2.76E-04	3.02E-04	3.36E-04	3.64E-04	4.12E-04	4.51E-04	4.11E-04	2.83E-04	2.11E-04	1.93E-04	1.67E-04
	Emission in each Box of 2nd jet	g/s	5.89E-05	4.09E-05	2.83E-05	2.21E-05	1.91E-05	4.13E-05	9.44E-05	1.81E-04	3.24E-04	2.95E-04	2.50E-04	2.33E-04	1.53E-04	1.38E-04	1.51E-04	1.68E-04	1.82E-04	2.06E-04	2.25E-04	2.05E-04	1.41E-04	1.06E-04	9.66E-05	8.33E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0016***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0012***	***0.0014***	***0.0013***	***0.0008***	***0.0006***	***0.0005***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.02E-04	1.58E-04	1.09E-04	8.24E-05	7.03E-05	1.03E-04	2.27E-04	5.40E-04	1.19E-03	1.07E-03	8.94E-04	8.21E-04	6.00E-04	5.37E-04	5.96E-04	6.69E-04	7.29E-04	8.32E-04	9.25E-04	8.43E-04	5.61E-04	4.00E-04	3.63E-04	3.14E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.01E-04	7.91E-05	5.43E-05	4.12E-05	3.52E-05	5.14E-05	1.14E-04	2.70E-04	5.95E-04	5.36E-04	4.47E-04	4.11E-04	3.00E-04	2.69E-04	2.98E-04	3.34E-04	3.64E-04	4.16E-04	4.63E-04	4.21E-04	2.81E-04	2.00E-04	1.81E-04	1.57E-04
	Emission in each Box of 1st jet	g/s	2.02E-05	1.58E-05	1.09E-05	8.24E-06	7.03E-06	1.03E-05	2.27E-05	5.40E-05	1.19E-04	1.07E-04	8.94E-05	8.21E-05	6.00E-05	5.37E-05	5.96E-05	6.69E-05	7.29E-05	8.32E-05	9.25E-05	8.43E-05	5.61E-05	4.00E-05	3.63E-05	3.14E-05
	Emission in each Box of 2nd jet	g/s	1.01E-05	7.91E-06	5.43E-06	4.12E-06	3.52E-06	5.14E-06	1.14E-05	2.70E-05	5.95E-05	5.36E-05	4.47E-05	4.11E-05	3.00E-05	2.69E-05	2.98E-05	3.34E-05	3.64E-05	4.16E-05	4.63E-05	4.21E-05	2.81E-05	2.00E-05	1.81E-05	1.57E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1409	0.1189	0.1208	0.1268	0.1301	0.2391	0.2524	0.1938	0.2291	0.2119	0.1924	0.1874	0.1472	0.1439	0.1475	0.1560	0.1626	0.1725	0.1834	0.1752	0.1488	0.1344	0.1337	0.1312
	NO2	g/vehicle/km	0.0242	0.0230	0.0232	0.0238	0.0241	0.0299	0.0305	0.0288	0.0421	0.0387	0.0346	0.0333	0.0292	0.0282	0.0293	0.0313	0.0328	0.0350	0.0378	0.0360	0.0295	0.0255	0.0251	0.0247
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0018***	***0.0012***	***0.0008***	***0.0007***	***0.0006***	***0.0012***	***0.0027***	***0.0054***	***0.0095***	***0.0086***	***0.0071***	***0.0066***	***0.0043***	***0.0040***	***0.0043***	***0.0048***	***0.0052***	***0.0060***	***0.0067***	***0.0062***	***0.0043***	***0.0032***	***0.0030***	***0.0026***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.19E-03	8.16E-04	5.65E-04	4.42E-04	3.74E-04	8.05E-04	1.83E-03	3.57E-03	6.36E-03	5.72E-03	4.74E-03	4.42E-03	2.89E-03	2.65E-03	2.88E-03	3.20E-03	3.49E-03	3.99E-03	4.48E-03	4.11E-03	2.86E-03	2.11E-03	1.97E-03	1.70E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.94E-04	4.08E-04	2.83E-04	2.21E-04	1.87E-04	4.03E-04	9.13E-04	1.79E-03	3.18E-03	2.86E-03	2.37E-03	2.21E-03	1.44E-03	1.32E-03	1.44E-03	1.60E-03	1.74E-03	1.99E-03	2.24E-03	2.06E-03	1.43E-03	1.06E-03	9.84E-04	8.52E-04
	Emission in each Box of 1st jet	g/s	1.19E-04	8.16E-05	5.65E-05	4.42E-05	3.74E-05	8.05E-05	1.83E-04	3.57E-04	6.36E-04	5.72E-04	4.74E-04	4.42E-04	2.89E-04	2.65E-04	2.88E-04	3.20E-04	3.49E-04	3.99E-04	4.48E-04	4.11E-04	2.86E-04	2.11E-04	1.97E-04	1.70E-04
	Emission in each Box of 2nd jet	g/s	5.94E-05	4.08E-05	2.83E-05	2.21E-05	1.87E-05	4.03E-05	9.13E-05	1.79E-04	3.18E-04	2.86E-04	2.37E-04	2.21E-04	1.44E-04	1.32E-04	1.44E-04	1.60E-04	1.74E-04	1.99E-04	2.24E-04	2.06E-04	1.43E-04	1.06E-04	9.84E-05	8.52E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0016***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0012***	***0.0014***	***0.0013***	***0.0009***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.04E-04	1.58E-04	1.09E-04	8.28E-05	6.92E-05	1.01E-04	2.21E-04	5.31E-04	1.17E-03	1.04E-03	8.52E-04	7.85E-04	5.73E-04	5.19E-04	5.71E-04	6.42E-04	7.02E-04	8.09E-04	9.23E-04	8.45E-04	5.68E-04	4.01E-04	3.70E-04	3.21E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.02E-04	7.91E-05	5.44E-05	4.14E-05	3.46E-05	5.03E-05	1.10E-04	2.66E-04	5.85E-04	5.21E-04	4.26E-04	3.93E-04	2.87E-04	2.59E-04	2.86E-04	3.21E-04	3.51E-04	4.05E-04	4.61E-04	4.22E-04	2.84E-04	2.01E-04	1.85E-04	1.60E-04
	Emission in each Box of 1st jet	g/s	2.04E-05	1.58E-05	1.09E-05	8.28E-06	6.92E-06	1.01E-05	2.21E-05	5.31E-05	1.17E-04	1.04E-04	8.52E-05	7.85E-05	5.73E-05	5.19E-05	5.71E-05	6.42E-05	7.02E-05	8.09E-05	9.23E-05	8.45E-05	5.68E-05	4.01E-05	3.70E-05	3.21E-05
	Emission in each Box of 2nd jet	g/s	1.02E-05	7.91E-06	5.44E-06	4.14E-06	3.46E-06	5.03E-06	1.10E-05	2.66E-05	5.85E-05	5.21E-05	4.26E-05	3.93E-05	2.87E-05	2.59E-05	2.86E-05	3.21E-05	3.51E-05	4.05E-05	4.61E-05	4.22E-05	2.84E-05	2.01E-05	1.85E-05	1.60E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1292	0.1103	0.1133	0.1188	0.1220	0.2271	0.2437	0.1934	0.2276	0.2114	0.1949	0.1876	0.1451	0.1423	0.1441	0.1526	0.1595	0.1669	0.1749	0.1649	0.1386	0.1248	0.1215	0.1167
	NO2	g/vehicle/km	0.0224	0.0217	0.0221	0.0225	0.0228	0.0285	0.0296	0.0289	0.0420	0.0387	0.0351	0.0334	0.0289	0.0280	0.0288	0.0307	0.0323	0.0341	0.0363	0.0341	0.0278	0.0239	0.0231	0.0223
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0011***	***0.0026***	***0.0053***	***0.0095***	***0.0086***	***0.0072***	***0.0066***	***0.0043***	***0.0039***	***0.0042***	***0.0047***	***0.0051***	***0.0058***	***0.0064***	***0.0058***	***0.0040***	***0.0029***	***0.0027***	***0.0023***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.09E-03	7.57E-04	5.30E-04	4.14E-04	3.51E-04	7.65E-04	1.76E-03	3.56E-03	6.32E-03	5.70E-03	4.80E-03	4.43E-03	2.85E-03	2.61E-03	2.81E-03	3.13E-03	3.42E-03	3.86E-03	4.27E-03	3.87E-03	2.67E-03	1.96E-03	1.79E-03	1.52E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.45E-04	3.79E-04	2.65E-04	2.07E-04	1.76E-04	3.82E-04	8.82E-04	1.78E-03	3.16E-03	2.85E-03	2.40E-03	2.21E-03	1.42E-03	1.31E-03	1.41E-03	1.56E-03	1.71E-03	1.93E-03	2.14E-03	1.93E-03	1.33E-03	9.82E-04	8.95E-04	7.58E-04
	Emission in each Box of 1st jet	g/s	1.09E-04	7.57E-05	5.30E-05	4.14E-05	3.51E-05	7.65E-05	1.76E-04	3.56E-04	6.32E-04	5.70E-04	4.80E-04	4.43E-04	2.85E-04	2.61E-04	2.81E-04	3.13E-04	3.42E-04	3.86E-04	4.27E-04	3.87E-04	2.67E-04	1.96E-04	1.79E-04	1.52E-04
	Emission in each Box of 2nd jet	g/s	5.45E-05	3.79E-05	2.65E-05	2.07E-05	1.76E-05	3.82E-05	8.82E-05	1.78E-04	3.16E-04	2.85E-04	2.40E-04	2.21E-04	1.42E-04	1.31E-04	1.41E-04	1.56E-04	1.71E-04	1.93E-04	2.14E-04	1.93E-04	1.33E-04	9.82E-05	8.95E-05	7.58E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0016***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0008***	***0.0009***	***0.0010***	***0.0012***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.89E-04	1.49E-04	1.03E-04	7.84E-05	6.57E-05	9.60E-05	2.14E-04	5.32E-04	1.17E-03	1.05E-03	8.65E-04	7.89E-04	5.67E-04	5.15E-04	5.61E-04	6.29E-04	6.94E-04	7.89E-04	8.86E-04	8.01E-04	5.35E-04	3.77E-04	3.40E-04	2.90E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.46E-05	7.44E-05	5.16E-05	3.92E-05	3.28E-05	4.80E-05	1.07E-04	2.66E-04	5.83E-04	5.23E-04	4.32E-04	3.95E-04	2.84E-04	2.58E-04	2.81E-04	3.15E-04	3.47E-04	3.94E-04	4.43E-04	4.00E-04	2.67E-04	1.88E-04	1.70E-04	1.45E-04
	Emission in each Box of 1st jet	g/s	1.89E-05	1.49E-05	1.03E-05	7.84E-06	6.57E-06	9.60E-06	2.14E-05	5.32E-05	1.17E-04	1.05E-04	8.65E-05	7.89E-05	5.67E-05	5.15E-05	5.61E-05	6.29E-05	6.94E-05	7.89E-05	8.86E-05	8.01E-05	5.35E-05	3.77E-05	3.40E-05	2.90E-05
	Emission in each Box of 2nd jet	g/s	9.46E-06	7.44E-06	5.16E-06	3.92E-06	3.28E-06	4.80E-06	1.07E-05	2.66E-05	5.83E-05	5.23E-05	4.32E-05	3.95E-05	2.84E-05	2.58E-05	2.81E-05	3.15E-05	3.47E-05	3.94E-05	4.43E-05	4.00E-05	2.67E-05	1.88E-05	1.70E-05	1.45E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1243	0.1026	0.1037	0.1074	0.1100	0.2042	0.2159	0.1656	0.2005	0.1860	0.1735	0.1694	0.1330	0.1273	0.1325	0.1387	0.1428	0.1488	0.1565	0.1496	0.1269	0.1170	0.1149	0.1115
	NO2	g/vehicle/km	0.0216	0.0203	0.0204	0.0206	0.0208	0.0259	0.0264	0.0251	0.0374	0.0345	0.0316	0.0304	0.0267	0.0253	0.0266	0.0281	0.0292	0.0306	0.0327	0.0312	0.0257	0.0225	0.0219	0.0214
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0007***	***0.0006***	***0.0005***	***0.0010***	***0.0023***	***0.0046***	***0.0084***	***0.0075***	***0.0064***	***0.0060***	***0.0039***	***0.0035***	***0.0039***	***0.0043***	***0.0046***	***0.0052***	***0.0057***	***0.0053***	***0.0037***	***0.0028***	***0.0025***	***0.0022***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.05E-03	7.05E-04	4.85E-04	3.74E-04	3.16E-04	6.88E-04	1.56E-03	3.05E-03	5.57E-03	5.02E-03	4.28E-03	4.00E-03	2.61E-03	2.34E-03	2.58E-03	2.84E-03	3.06E-03	3.44E-03	3.82E-03	3.51E-03	2.44E-03	1.84E-03	1.69E-03	1.45E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.24E-04	3.52E-04	2.43E-04	1.87E-04	1.58E-04	3.44E-04	7.81E-04	1.53E-03	2.78E-03	2.51E-03	2.14E-03	2.00E-03	1.30E-03	1.17E-03	1.29E-03	1.42E-03	1.53E-03	1.72E-03	1.91E-03	1.76E-03	1.22E-03	9.21E-04	8.46E-04	7.24E-04
	Emission in each Box of 1st jet	g/s	1.05E-04	7.05E-05	4.85E-05	3.74E-05	3.16E-05	6.88E-05	1.56E-04	3.05E-04	5.57E-04	5.02E-04	4.28E-04	4.00E-04	2.61E-04	2.34E-04	2.58E-04	2.84E-04	3.06E-04	3.44E-04	3.82E-04	3.51E-04	2.44E-04	1.84E-04	1.69E-04	1.45E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.52E-05	2.43E-05	1.87E-05	1.58E-05	3.44E-05	7.81E-05	1.53E-04	2.78E-04	2.51E-04	2.14E-04	2.00E-04	1.30E-04	1.17E-04	1.29E-04	1.42E-04	1.53E-04	1.72E-04	1.91E-04	1.76E-04	1.22E-04	9.21E-05	8.46E-05	7.24E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0014***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.82E-04	1.40E-04	9.55E-05	7.18E-05	6.00E-05	8.70E-05	1.91E-04	4.63E-04	1.04E-03	9.30E-04	7.79E-04	7.18E-04	5.24E-04	4.65E-04	5.19E-04	5.76E-04	6.25E-04	7.08E-04	8.00E-04	7.32E-04	4.94E-04	3.54E-04	3.23E-04	2.78E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.11E-05	6.98E-05	4.78E-05	3.59E-05	3.00E-05	4.35E-05	9.56E-05	2.31E-04	5.19E-04	4.65E-04	3.89E-04	3.59E-04	2.62E-04	2.33E-04	2.60E-04	2.88E-04	3.13E-04	3.54E-04	4.00E-04	3.66E-04	2.47E-04	1.77E-04	1.62E-04	1.39E-04
	Emission in each Box of 1st jet	g/s	1.82E-05	1.40E-05	9.55E-06	7.18E-06	6.00E-06	8.70E-06	1.91E-05	4.63E-05	1.04E-04	9.30E-05	7.79E-05	7.18E-05	5.24E-05	4.65E-05	5.19E-05	5.76E-05	6.25E-05	7.08E-05	8.00E-05	7.32E-05	4.94E-05	3.54E-05	3.23E-05	2.78E-05
	Emission in each Box of 2nd jet	g/s	9.11E-06	6.98E-06	4.78E-06	3.59E-06	3.00E-06	4.35E-06	9.56E-06	2.31E-05	5.19E-05	4.65E-05	3.89E-05	3.59E-05	2.62E-05	2.33E-05	2.60E-05	2.88E-05	3.13E-05	3.54E-05	4.00E-05	3.66E-05	2.47E-05	1.77E-05	1.62E-05	1.39E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involved	104P3
Road Located	089
Vehicle EF Adopted	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1130	0.0970	0.1009	0.1036	0.1056	0.1949	0.2059	0.1632	0.1998	0.1832	0.1704	0.1633	0.1281	0.1276	0.1311	0.1384	0.1418	0.1508	0.1626	0.1520	0.1285	0.1173	0.1138	0.1130
	NO2	g/vehicle/km	0.0199	0.0194	0.0199	0.0200	0.0201	0.0248	0.0253	0.0247	0.0372	0.0340	0.0311	0.0294	0.0258	0.0254	0.0264	0.0281	0.0290	0.0311	0.0339	0.0317	0.0260	0.0226	0.0217	0.0216
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0010***	***0.0022***	***0.0045***	***0.0083***	***0.0074***	***0.0063***	***0.0058***	***0.0038***	***0.0035***	***0.0038***	***0.0043***	***0.0046***	***0.0052***	***0.0060***	***0.0053***	***0.0037***	***0.0028***	***0.0025***	***0.0022***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.53E-04	6.66E-04	4.72E-04	3.61E-04	3.04E-04	6.56E-04	1.49E-03	3.01E-03	5.55E-03	4.94E-03	4.20E-03	3.85E-03	2.51E-03	2.35E-03	2.56E-03	2.84E-03	3.04E-03	3.49E-03	3.97E-03	3.57E-03	2.47E-03	1.85E-03	1.68E-03	1.47E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.76E-04	3.33E-04	2.36E-04	1.80E-04	1.52E-04	3.28E-04	7.45E-04	1.50E-03	2.77E-03	2.47E-03	2.10E-03	1.93E-03	1.26E-03	1.17E-03	1.28E-03	1.42E-03	1.52E-03	1.74E-03	1.99E-03	1.78E-03	1.24E-03	9.23E-04	8.38E-04	7.34E-04
	Emission in each Box of 1st jet	g/s	9.53E-05	6.66E-05	4.72E-05	3.61E-05	3.04E-05	6.56E-05	1.49E-04	3.01E-04	5.55E-04	4.94E-04	4.20E-04	3.85E-04	2.51E-04	2.35E-04	2.56E-04	2.84E-04	3.04E-04	3.49E-04	3.97E-04	3.57E-04	2.47E-04	1.85E-04	1.68E-04	1.47E-04
	Emission in each Box of 2nd jet	g/s	4.76E-05	3.33E-05	2.36E-05	1.80E-05	1.52E-05	3.28E-05	7.45E-05	1.50E-04	2.77E-04	2.47E-04	2.10E-04	1.93E-04	1.26E-04	1.17E-04	1.28E-04	1.42E-04	1.52E-04	1.74E-04	1.99E-04	1.78E-04	1.24E-04	9.23E-05	8.38E-05	7.34E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0014***	***0.0011***	***0.0010***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.67E-04	1.33E-04	9.32E-05	6.96E-05	5.79E-05	8.34E-05	1.83E-04	4.55E-04	1.03E-03	9.17E-04	7.66E-04	6.93E-04	5.07E-04	4.66E-04	5.15E-04	5.75E-04	6.21E-04	7.18E-04	8.28E-04	7.44E-04	4.99E-04	3.55E-04	3.20E-04	2.81E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.37E-05	6.65E-05	4.66E-05	3.48E-05	2.90E-05	4.17E-05	9.16E-05	2.27E-04	5.17E-04	4.58E-04	3.83E-04	3.47E-04	2.53E-04	2.33E-04	2.57E-04	2.88E-04	3.10E-04	3.59E-04	4.14E-04	3.72E-04	2.50E-04	1.78E-04	1.60E-04	1.41E-04
	Emission in each Box of 1st jet	g/s	1.67E-05	1.33E-05	9.32E-06	6.96E-06	5.79E-06	8.34E-06	1.83E-05	4.55E-05	1.03E-04	9.17E-05	7.66E-05	6.93E-05	5.07E-05	4.66E-05	5.15E-05	5.75E-05	6.21E-05	7.18E-05	8.28E-05	7.44E-05	4.99E-05	3.55E-05	3.20E-05	2.81E-05
	Emission in each Box of 2nd jet	g/s	8.37E-06	6.65E-06	4.66E-06	3.48E-06	2.90E-06	4.17E-06	9.16E-06	2.27E-05	5.17E-05	4.58E-05	3.83E-05	3.47E-05	2.53E-05	2.33E-05	2.57E-05	2.88E-05	3.10E-05	3.59E-05	4.14E-05	3.72E-05	2.50E-05	1.78E-05	1.60E-05	1.41E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1105	0.0936	0.0967	0.0991	0.0996	0.1900	0.1977	0.1556	0.1891	0.1833	0.1732	0.1714	0.1330	0.1297	0.1338	0.1424	0.1405	0.1488	0.1572	0.1460	0.1201	0.1096	0.1065	0.1026
	NO2	g/vehicle/km	0.0194	0.0187	0.0191	0.0192	0.0190	0.0241	0.0243	0.0236	0.0354	0.0340	0.0315	0.0308	0.0267	0.0257	0.0269	0.0289	0.0287	0.0307	0.0329	0.0305	0.0243	0.0212	0.0205	0.0198
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0010***	***0.0021***	***0.0043***	***0.0079***	***0.0074***	***0.0064***	***0.0061***	***0.0039***	***0.0036***	***0.0039***	***0.0044***	***0.0045***	***0.0052***	***0.0058***	***0.0051***	***0.0035***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.32E-04	6.43E-04	4.52E-04	3.45E-04	2.87E-04	6.39E-04	1.43E-03	2.87E-03	5.25E-03	4.95E-03	4.27E-03	4.04E-03	2.61E-03	2.38E-03	2.61E-03	2.92E-03	3.01E-03	3.44E-03	3.84E-03	3.43E-03	2.31E-03	1.72E-03	1.57E-03	1.33E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.66E-04	3.21E-04	2.26E-04	1.73E-04	1.43E-04	3.20E-04	7.16E-04	1.43E-03	2.63E-03	2.47E-03	2.13E-03	2.02E-03	1.30E-03	1.19E-03	1.30E-03	1.46E-03	1.51E-03	1.72E-03	1.92E-03	1.71E-03	1.16E-03	8.62E-04	7.84E-04	6.66E-04
	Emission in each Box of 1st jet	g/s	9.32E-05	6.43E-05	4.52E-05	3.45E-05	2.87E-05	6.39E-05	1.43E-04	2.87E-04	5.25E-04	4.95E-04	4.27E-04	4.04E-04	2.61E-04	2.38E-04	2.61E-04	2.92E-04	3.01E-04	3.44E-04	3.84E-04	3.43E-04	2.31E-04	1.72E-04	1.57E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	4.66E-05	3.21E-05	2.26E-05	1.73E-05	1.43E-05	3.20E-05	7.16E-05	1.43E-04	2.63E-04	2.47E-04	2.13E-04	2.02E-04	1.30E-04	1.19E-04	1.30E-04	1.46E-04	1.51E-04	1.72E-04	1.92E-04	1.71E-04	1.16E-04	8.62E-05	7.84E-05	6.66E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.63E-04	1.28E-04	8.95E-05	6.67E-05	5.48E-05	8.12E-05	1.76E-04	4.35E-04	9.83E-04	9.17E-04	7.77E-04	7.26E-04	5.24E-04	4.73E-04	5.24E-04	5.92E-04	6.16E-04	7.09E-04	8.02E-04	7.16E-04	4.68E-04	3.34E-04	3.02E-04	2.58E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.17E-05	6.42E-05	4.47E-05	3.34E-05	2.74E-05	4.06E-05	8.80E-05	2.18E-04	4.92E-04	4.58E-04	3.88E-04	3.63E-04	2.62E-04	2.37E-04	2.62E-04	2.96E-04	3.08E-04	3.55E-04	4.01E-04	3.58E-04	2.34E-04	1.67E-04	1.51E-04	1.29E-04
	Emission in each Box of 1st jet	g/s	1.63E-05	1.28E-05	8.95E-06	6.67E-06	5.48E-06	8.12E-06	1.76E-05	4.35E-05	9.83E-05	9.17E-05	7.77E-05	7.26E-05	5.24E-05	4.73E-05	5.24E-05	5.92E-05	6.16E-05	7.09E-05	8.02E-05	7.16E-05	4.68E-05	3.34E-05	3.02E-05	2.58E-05
	Emission in each Box of 2nd jet	g/s	8.17E-06	6.42E-06	4.47E-06	3.34E-06	2.74E-06	4.06E-06	8.80E-06	2.18E-05	4.92E-05	4.58E-05	3.88E-05	3.63E-05	2.62E-05	2.37E-05	2.62E-05	2.96E-05	3.08E-05	3.55E-05	4.01E-05	3.58E-05	2.34E-05	1.67E-05	1.51E-05	1.29E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1169	0.0962	0.1000	0.1045	0.1056	0.1941	0.2051	0.1548	0.1910	0.1796	0.1693	0.1640	0.1292	0.1295	0.1340	0.1405	0.1501	0.1560	0.1662	0.1546	0.1259	0.1112	0.1106	0.1081
	NO2	g/vehicle/km	0.0205	0.0192	0.0198	0.0201	0.0201	0.0247	0.0252	0.0235	0.0357	0.0334	0.0309	0.0295	0.0260	0.0257	0.0269	0.0285	0.0306	0.0321	0.0346	0.0322	0.0255	0.0215	0.0212	0.0208
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0010***	***0.0022***	***0.0043***	***0.0080***	***0.0073***	***0.0063***	***0.0058***	***0.0038***	***0.0036***	***0.0039***	***0.0043***	***0.0048***	***0.0054***	***0.0061***	***0.0054***	***0.0036***	***0.0026***	***0.0024***	***0.0021***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.86E-04	6.60E-04	4.68E-04	3.64E-04	3.04E-04	6.53E-04	1.48E-03	2.85E-03	5.31E-03	4.85E-03	4.17E-03	3.87E-03	2.54E-03	2.38E-03	2.61E-03	2.88E-03	3.22E-03	3.60E-03	4.06E-03	3.63E-03	2.42E-03	1.75E-03	1.63E-03	1.40E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.93E-04	3.30E-04	2.34E-04	1.82E-04	1.52E-04	3.27E-04	7.42E-04	1.43E-03	2.65E-03	2.42E-03	2.09E-03	1.94E-03	1.27E-03	1.19E-03	1.31E-03	1.44E-03	1.61E-03	1.80E-03	2.03E-03	1.81E-03	1.21E-03	8.75E-04	8.14E-04	7.02E-04
	Emission in each Box of 1st jet	g/s	9.86E-05	6.60E-05	4.68E-05	3.64E-05	3.04E-05	6.53E-05	1.48E-04	2.85E-04	5.31E-04	4.85E-04	4.17E-04	3.87E-04	2.54E-04	2.38E-04	2.61E-04	2.88E-04	3.22E-04	3.60E-04	4.06E-04	3.63E-04	2.42E-04	1.75E-04	1.63E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	4.93E-05	3.30E-05	2.34E-05	1.82E-05	1.52E-05	3.27E-05	7.42E-05	1.43E-04	2.65E-04	2.42E-04	2.09E-04	1.94E-04	1.27E-04	1.19E-04	1.31E-04	1.44E-04	1.61E-04	1.80E-04	2.03E-04	1.81E-04	1.21E-04	8.75E-05	8.14E-05	7.02E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0013***	***0.0011***	***0.0010***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.73E-04	1.32E-04	9.26E-05	7.01E-05	5.79E-05	8.31E-05	1.82E-04	4.34E-04	9.92E-04	9.00E-04	7.61E-04	6.96E-04	5.11E-04	4.73E-04	5.25E-04	5.83E-04	6.56E-04	7.41E-04	8.45E-04	7.56E-04	4.90E-04	3.39E-04	3.12E-04	2.70E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.63E-05	6.60E-05	4.63E-05	3.51E-05	2.90E-05	4.15E-05	9.12E-05	2.17E-04	4.96E-04	4.50E-04	3.80E-04	3.48E-04	2.55E-04	2.36E-04	2.62E-04	2.92E-04	3.28E-04	3.70E-04	4.22E-04	3.78E-04	2.45E-04	1.70E-04	1.56E-04	1.35E-04
	Emission in each Box of 1st jet	g/s	1.73E-05	1.32E-05	9.26E-06	7.01E-06	5.79E-06	8.31E-06	1.82E-05	4.34E-05	9.92E-05	9.00E-05	7.61E-05	6.96E-05	5.11E-05	4.73E-05	5.25E-05	5.83E-05	6.56E-05	7.41E-05	8.45E-05	7.56E-05	4.90E-05	3.39E-05	3.12E-05	2.70E-05
	Emission in each Box of 2nd jet	g/s	8.63E-06	6.60E-06	4.63E-06	3.51E-06	2.90E-06	4.15E-06	9.12E-06	2.17E-05	4.96E-05	4.50E-05	3.80E-05	3.48E-05	2.55E-05	2.36E-05	2.62E-05	2.92E-05	3.28E-05	3.70E-05	4.22E-05	3.78E-05	2.45E-05	1.70E-05	1.56E-05	1.35E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1161	0.0984	0.0986	0.1002	0.1051	0.1890	0.2006	0.1522	0.1827	0.1716	0.1678	0.1566	0.1271	0.1258	0.1330	0.1332	0.1349	0.1475	0.1586	0.1475	0.1258	0.1124	0.1103	0.1069
	NO2	g/vehicle/km	0.0203	0.0196	0.0195	0.0193	0.0200	0.0240	0.0246	0.0231	0.0343	0.0319	0.0306	0.0282	0.0256	0.0250	0.0267	0.0271	0.0277	0.0304	0.0331	0.0308	0.0255	0.0217	0.0212	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0010***	***0.0022***	***0.0042***	***0.0076***	***0.0069***	***0.0062***	***0.0055***	***0.0037***	***0.0035***	***0.0039***	***0.0041***	***0.0043***	***0.0051***	***0.0058***	***0.0052***	***0.0036***	***0.0027***	***0.0024***	***0.0021***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.79E-04	6.76E-04	4.61E-04	3.49E-04	3.02E-04	6.36E-04	1.45E-03	2.81E-03	5.07E-03	4.63E-03	4.13E-03	3.69E-03	2.49E-03	2.31E-03	2.59E-03	2.73E-03	2.89E-03	3.41E-03	3.87E-03	3.46E-03	2.42E-03	1.77E-03	1.62E-03	1.39E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.90E-04	3.38E-04	2.31E-04	1.74E-04	1.51E-04	3.18E-04	7.26E-04	1.40E-03	2.54E-03	2.31E-03	2.07E-03	1.85E-03	1.25E-03	1.16E-03	1.30E-03	1.36E-03	1.45E-03	1.70E-03	1.94E-03	1.73E-03	1.21E-03	8.84E-04	8.12E-04	6.94E-04
	Emission in each Box of 1st jet	g/s	9.79E-05	6.76E-05	4.61E-05	3.49E-05	3.02E-05	6.36E-05	1.45E-04	2.81E-04	5.07E-04	4.63E-04	4.13E-04	3.69E-04	2.49E-04	2.31E-04	2.59E-04	2.73E-04	2.89E-04	3.41E-04	3.87E-04	3.46E-04	2.42E-04	1.77E-04	1.62E-04	1.39E-04
	Emission in each Box of 2nd jet	g/s	4.90E-05	3.38E-05	2.31E-05	1.74E-05	1.51E-05	3.18E-05	7.26E-05	1.40E-04	2.54E-04	2.31E-04	2.07E-04	1.85E-04	1.25E-04	1.16E-04	1.30E-04	1.36E-04	1.45E-04	1.70E-04	1.94E-04	1.73E-04	1.21E-04	8.84E-05	8.12E-05	6.94E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0014***	***0.0013***	***0.0011***	***0.0010***	***0.0008***	***0.0007***	***0.0008***	***0.0008***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.71E-04	1.35E-04	9.14E-05	6.73E-05	5.76E-05	8.09E-05	1.78E-04	4.27E-04	9.53E-04	8.61E-04	7.55E-04	6.66E-04	5.02E-04	4.60E-04	5.21E-04	5.55E-04	5.93E-04	7.02E-04	8.09E-04	7.23E-04	4.90E-04	3.42E-04	3.12E-04	2.67E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.57E-05	6.73E-05	4.57E-05	3.36E-05	2.88E-05	4.04E-05	8.92E-05	2.13E-04	4.76E-04	4.30E-04	3.77E-04	3.33E-04	2.51E-04	2.30E-04	2.61E-04	2.77E-04	2.96E-04	3.51E-04	4.05E-04	3.61E-04	2.45E-04	1.71E-04	1.56E-04	1.34E-04
	Emission in each Box of 1st jet	g/s	1.71E-05	1.35E-05	9.14E-06	6.73E-06	5.76E-06	8.09E-06	1.78E-05	4.27E-05	9.53E-05	8.61E-05	7.55E-05	6.66E-05	5.02E-05	4.60E-05	5.21E-05	5.55E-05	5.93E-05	7.02E-05	8.09E-05	7.23E-05	4.90E-05	3.42E-05	3.12E-05	2.67E-05
	Emission in each Box of 2nd jet	g/s	8.57E-06	6.73E-06	4.57E-06	3.36E-06	2.88E-06	4.04E-06	8.92E-06	2.13E-05	4.76E-05	4.30E-05	3.77E-05	3.33E-05	2.51E-05	2.30E-05	2.61E-05	2.77E-05	2.96E-05	3.51E-05	4.05E-05	3.61E-05	2.45E-05	1.71E-05	1.56E-05	1.34E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1327	0.1142	0.1151	0.1188	0.1221	0.2286	0.2401	0.1827	0.2185	0.2027	0.1881	0.1840	0.1458	0.1411	0.1438	0.1538	0.1562	0.1661	0.1786	0.1674	0.1422	0.1269	0.1259	0.1243
	NO2	g/vehicle/km	0.0229	0.0223	0.0223	0.0225	0.0228	0.0286	0.0291	0.0274	0.0404	0.0372	0.0340	0.0328	0.0290	0.0278	0.0287	0.0309	0.0316	0.0339	0.0369	0.0346	0.0284	0.0242	0.0238	0.0235
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0026***	***0.0050***	***0.0091***	***0.0082***	***0.0070***	***0.0065***	***0.0043***	***0.0039***	***0.0042***	***0.0047***	***0.0050***	***0.0058***	***0.0065***	***0.0059***	***0.0041***	***0.0030***	***0.0028***	***0.0024***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.12E-03	7.84E-04	5.38E-04	4.14E-04	3.51E-04	7.69E-04	1.74E-03	3.37E-03	6.07E-03	5.47E-03	4.64E-03	4.34E-03	2.86E-03	2.59E-03	2.80E-03	3.15E-03	3.35E-03	3.84E-03	4.36E-03	3.93E-03	2.73E-03	2.00E-03	1.85E-03	1.61E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.60E-04	3.92E-04	2.69E-04	2.07E-04	1.76E-04	3.85E-04	8.69E-04	1.68E-03	3.03E-03	2.73E-03	2.32E-03	2.17E-03	1.43E-03	1.30E-03	1.40E-03	1.58E-03	1.68E-03	1.92E-03	2.18E-03	1.96E-03	1.37E-03	9.99E-04	9.27E-04	8.07E-04
	Emission in each Box of 1st jet	g/s	1.12E-04	7.84E-05	5.38E-05	4.14E-05	3.51E-05	7.69E-05	1.74E-04	3.37E-04	6.07E-04	5.47E-04	4.64E-04	4.34E-04	2.86E-04	2.59E-04	2.80E-04	3.15E-04	3.35E-04	3.84E-04	4.36E-04	3.93E-04	2.73E-04	2.00E-04	1.85E-04	1.61E-04
	Emission in each Box of 2nd jet	g/s	5.60E-05	3.92E-05	2.69E-05	2.07E-05	1.76E-05	3.85E-05	8.69E-05	1.68E-04	3.03E-04	2.73E-04	2.32E-04	2.17E-04	1.43E-04	1.30E-04	1.40E-04	1.58E-04	1.68E-04	1.92E-04	2.18E-04	1.96E-04	1.37E-04	9.99E-05	9.27E-05	8.07E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0015***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0008***	***0.0009***	***0.0010***	***0.0012***	***0.0014***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.93E-04	1.53E-04	1.05E-04	7.84E-05	6.56E-05	9.63E-05	2.11E-04	5.05E-04	1.12E-03	1.00E-03	8.38E-04	7.74E-04	5.69E-04	5.10E-04	5.59E-04	6.33E-04	6.78E-04	7.84E-04	9.00E-04	8.12E-04	5.46E-04	3.82E-04	3.51E-04	3.06E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.66E-05	7.64E-05	5.23E-05	3.92E-05	3.28E-05	4.82E-05	1.05E-04	2.52E-04	5.60E-04	5.02E-04	4.19E-04	3.87E-04	2.85E-04	2.55E-04	2.80E-04	3.16E-04	3.39E-04	3.92E-04	4.50E-04	4.06E-04	2.73E-04	1.91E-04	1.75E-04	1.53E-04
	Emission in each Box of 1st jet	g/s	1.93E-05	1.53E-05	1.05E-05	7.84E-06	6.56E-06	9.63E-06	2.11E-05	5.05E-05	1.12E-04	1.00E-04	8.38E-05	7.74E-05	5.69E-05	5.10E-05	5.59E-05	6.33E-05	6.78E-05	7.84E-05	9.00E-05	8.12E-05	5.46E-05	3.82E-05	3.51E-05	3.06E-05
	Emission in each Box of 2nd jet	g/s	9.66E-06	7.64E-06	5.23E-06	3.92E-06	3.28E-06	4.82E-06	1.05E-05	2.52E-05	5.60E-05	5.02E-05	4.19E-05	3.87E-05	2.85E-05	2.55E-05	2.80E-05	3.16E-05	3.39E-05	3.92E-05	4.50E-05	4.06E-05	2.73E-05	1.91E-05	1.75E-05	1.53E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1457	0.1228	0.1259	0.1306	0.1339	0.2477	0.2629	0.1980	0.2369	0.2191	0.2042	0.1967	0.1570	0.1534	0.1570	0.1650	0.1682	0.1777	0.1908	0.1822	0.1528	0.1393	0.1373	0.1349
	NO2	g/vehicle/km	0.0249	0.0238	0.0241	0.0244	0.0247	0.0308	0.0317	0.0295	0.0434	0.0399	0.0365	0.0348	0.0309	0.0298	0.0310	0.0329	0.0337	0.0360	0.0391	0.0373	0.0303	0.0263	0.0257	0.0253
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0018***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0029***	***0.0055***	***0.0099***	***0.0089***	***0.0075***	***0.0070***	***0.0046***	***0.0042***	***0.0046***	***0.0051***	***0.0054***	***0.0062***	***0.0070***	***0.0064***	***0.0044***	***0.0033***	***0.0030***	***0.0026***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.23E-03	8.44E-04	5.89E-04	4.55E-04	3.85E-04	8.34E-04	1.90E-03	3.65E-03	6.58E-03	5.91E-03	5.03E-03	4.64E-03	3.08E-03	2.82E-03	3.06E-03	3.38E-03	3.61E-03	4.11E-03	4.66E-03	4.27E-03	2.94E-03	2.19E-03	2.02E-03	1.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.14E-04	4.22E-04	2.94E-04	2.28E-04	1.93E-04	4.17E-04	9.51E-04	1.82E-03	3.29E-03	2.96E-03	2.52E-03	2.32E-03	1.54E-03	1.41E-03	1.53E-03	1.69E-03	1.80E-03	2.05E-03	2.33E-03	2.14E-03	1.47E-03	1.10E-03	1.01E-03	8.76E-04
	Emission in each Box of 1st jet	g/s	1.23E-04	8.44E-05	5.89E-05	4.55E-05	3.85E-05	8.34E-05	1.90E-04	3.65E-04	6.58E-04	5.91E-04	5.03E-04	4.64E-04	3.08E-04	2.82E-04	3.06E-04	3.38E-04	3.61E-04	4.11E-04	4.66E-04	4.27E-04	2.94E-04	2.19E-04	2.02E-04	1.75E-04
	Emission in each Box of 2nd jet	g/s	6.14E-05	4.22E-05	2.94E-05	2.28E-05	1.93E-05	4.17E-05	9.51E-05	1.82E-04	3.29E-04	2.96E-04	2.52E-04	2.32E-04	1.54E-04	1.41E-04	1.53E-04	1.69E-04	1.80E-04	2.05E-04	2.33E-04	2.14E-04	1.47E-04	1.10E-04	1.01E-04	8.76E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0016***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0012***	***0.0014***	***0.0013***	***0.0009***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.10E-04	1.63E-04	1.13E-04	8.50E-05	7.10E-05	1.04E-04	2.29E-04	5.44E-04	1.20E-03	1.08E-03	8.99E-04	8.20E-04	6.06E-04	5.48E-04	6.04E-04	6.74E-04	7.23E-04	8.31E-04	9.55E-04	8.75E-04	5.82E-04	4.14E-04	3.78E-04	3.28E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.05E-04	8.16E-05	5.64E-05	4.25E-05	3.55E-05	5.19E-05	1.15E-04	2.72E-04	6.02E-04	5.38E-04	4.50E-04	4.10E-04	3.03E-04	2.74E-04	3.02E-04	3.37E-04	3.62E-04	4.16E-04	4.77E-04	4.37E-04	2.91E-04	2.07E-04	1.89E-04	1.64E-04
	Emission in each Box of 1st jet	g/s	2.10E-05	1.63E-05	1.13E-05	8.50E-06	7.10E-06	1.04E-05	2.29E-05	5.44E-05	1.20E-04	1.08E-04	8.99E-05	8.20E-05	6.06E-05	5.48E-05	6.04E-05	6.74E-05	7.23E-05	8.31E-05	9.55E-05	8.75E-05	5.82E-05	4.14E-05	3.78E-05	3.28E-05
	Emission in each Box of 2nd jet	g/s	1.05E-05	8.16E-06	5.64E-06	4.25E-06	3.55E-06	5.19E-06	1.15E-05	2.72E-05	6.02E-05	5.38E-05	4.50E-05	4.10E-05	3.03E-05	2.74E-05	3.02E-05	3.37E-05	3.62E-05	4.16E-05	4.77E-05	4.37E-05	2.91E-05	2.07E-05	1.89E-05	1.64E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1519	0.1290	0.1322	0.1374	0.1401	0.2559	0.2716	0.2061	0.2448	0.2261	0.2107	0.2045	0.1626	0.1579	0.1617	0.1704	0.1748	0.1867	0.1980	0.1888	0.1588	0.1447	0.1430	0.1409
	NO2	g/vehicle/km	0.0257	0.0246	0.0249	0.0253	0.0255	0.0317	0.0325	0.0304	0.0444	0.0409	0.0373	0.0358	0.0317	0.0305	0.0316	0.0336	0.0348	0.0374	0.0402	0.0383	0.0311	0.0270	0.0264	0.0261
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0019***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0029***	***0.0057***	***0.0102***	***0.0092***	***0.0078***	***0.0072***	***0.0048***	***0.0044***	***0.0047***	***0.0052***	***0.0056***	***0.0065***	***0.0073***	***0.0066***	***0.0046***	***0.0034***	***0.0032***	***0.0027***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.28E-03	8.86E-04	6.18E-04	4.79E-04	4.03E-04	8.61E-04	1.97E-03	3.80E-03	6.80E-03	6.10E-03	5.19E-03	4.83E-03	3.19E-03	2.90E-03	3.15E-03	3.49E-03	3.75E-03	4.31E-03	4.83E-03	4.43E-03	3.05E-03	2.28E-03	2.11E-03	1.83E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.41E-04	4.43E-04	3.09E-04	2.39E-04	2.02E-04	4.31E-04	9.83E-04	1.90E-03	3.40E-03	3.05E-03	2.60E-03	2.41E-03	1.60E-03	1.45E-03	1.58E-03	1.75E-03	1.87E-03	2.16E-03	2.42E-03	2.21E-03	1.53E-03	1.14E-03	1.05E-03	9.15E-04
	Emission in each Box of 1st jet	g/s	1.28E-04	8.86E-05	6.18E-05	4.79E-05	4.03E-05	8.61E-05	1.97E-04	3.80E-04	6.80E-04	6.10E-04	5.19E-04	4.83E-04	3.19E-04	2.90E-04	3.15E-04	3.49E-04	3.75E-04	4.31E-04	4.83E-04	4.43E-04	3.05E-04	2.28E-04	2.11E-04	1.83E-04
	Emission in each Box of 2nd jet	g/s	6.41E-05	4.43E-05	3.09E-05	2.39E-05	2.02E-05	4.31E-05	9.83E-05	1.90E-04	3.40E-04	3.05E-04	2.60E-04	2.41E-04	1.60E-04	1.45E-04	1.58E-04	1.75E-04	1.87E-04	2.16E-04	2.42E-04	2.21E-04	1.53E-04	1.14E-04	1.05E-04	9.15E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0019***	***0.0017***	***0.0014***	***0.0013***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0015***	***0.0013***	***0.0009***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.17E-04	1.69E-04	1.17E-04	8.80E-05	7.33E-05	1.07E-04	2.35E-04	5.60E-04	1.23E-03	1.10E-03	9.20E-04	8.45E-04	6.21E-04	5.60E-04	6.17E-04	6.89E-04	7.45E-04	8.64E-04	9.81E-04	8.97E-04	5.99E-04	4.26E-04	3.89E-04	3.39E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.08E-04	8.45E-05	5.83E-05	4.40E-05	3.67E-05	5.33E-05	1.18E-04	2.80E-04	6.17E-04	5.51E-04	4.60E-04	4.22E-04	3.11E-04	2.80E-04	3.09E-04	3.45E-04	3.73E-04	4.32E-04	4.91E-04	4.49E-04	2.99E-04	2.13E-04	1.95E-04	1.70E-04
	Emission in each Box of 1st jet	g/s	2.17E-05	1.69E-05	1.17E-05	8.80E-06	7.33E-06	1.07E-05	2.35E-05	5.60E-05	1.23E-04	1.10E-04	9.20E-05	8.45E-05	6.21E-05	5.60E-05	6.17E-05	6.89E-05	7.45E-05	8.64E-05	9.81E-05	8.97E-05	5.99E-05	4.26E-05	3.89E-05	3.39E-05
	Emission in each Box of 2nd jet	g/s	1.08E-05	8.45E-06	5.83E-06	4.40E-06	3.67E-06	5.33E-06	1.18E-05	2.80E-05	6.17E-05	5.51E-05	4.60E-05	4.22E-05	3.11E-05	2.80E-05	3.09E-05	3.45E-05	3.73E-05	4.32E-05	4.91E-05	4.49E-05	2.99E-05	2.13E-05	1.95E-05	1.70E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1538	0.1318	0.1343	0.1400	0.1425	0.2594	0.2745	0.2096	0.2479	0.2290	0.2122	0.2074	0.1644	0.1606	0.1646	0.1736	0.1799	0.1912	0.2029	0.1928	0.1627	0.1482	0.1449	0.1419
	NO2	g/vehicle/km	0.0259	0.0249	0.0252	0.0256	0.0257	0.0320	0.0328	0.0307	0.0449	0.0412	0.0375	0.0361	0.0319	0.0308	0.0320	0.0340	0.0355	0.0381	0.0409	0.0389	0.0317	0.0276	0.0267	0.0262
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0010***	***0.0022***	***0.0042***	***0.0075***	***0.0067***	***0.0057***	***0.0053***	***0.0028***	***0.0026***	***0.0028***	***0.0031***	***0.0034***	***0.0039***	***0.0044***	***0.0040***	***0.0028***	***0.0021***	***0.0019***	***0.0016***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.35E-04	6.57E-04	4.57E-04	3.54E-04	3.00E-04	6.55E-04	1.48E-03	2.83E-03	5.01E-03	4.49E-03	3.80E-03	3.56E-03	1.90E-03	1.74E-03	1.89E-03	2.09E-03	2.27E-03	2.59E-03	2.91E-03	2.64E-03	1.84E-03	1.38E-03	1.26E-03	1.08E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.67E-04	3.28E-04	2.28E-04	1.77E-04	1.50E-04	3.27E-04	7.42E-04	1.42E-03	2.50E-03	2.25E-03	1.90E-03	1.78E-03	9.49E-04	8.68E-04	9.44E-04	1.04E-03	1.13E-03	1.30E-03	1.45E-03	1.32E-03	9.20E-04	6.91E-04	6.29E-04	5.40E-04
	Emission in each Box of 1st jet	g/s	9.35E-05	6.57E-05	4.57E-05	3.54E-05	3.00E-05	6.55E-05	1.48E-04	2.83E-04	5.01E-04	4.49E-04	3.80E-04	3.56E-04	1.90E-04	1.74E-04	1.89E-04	2.09E-04	2.27E-04	2.59E-04	2.91E-04	2.64E-04	1.84E-04	1.38E-04	1.26E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	4.67E-05	3.28E-05	2.28E-05	1.77E-05	1.50E-05	3.27E-05	7.42E-05	1.42E-04	2.50E-04	2.25E-04	1.90E-04	1.78E-04	9.49E-05	8.68E-05	9.44E-05	1.04E-04	1.13E-04	1.30E-04	1.45E-04	1.32E-04	9.20E-05	6.91E-05	6.29E-05	5.40E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0014***	***0.0012***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0009***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.57E-04	1.24E-04	8.57E-05	6.45E-05	5.41E-05	8.07E-05	1.77E-04	4.15E-04	9.07E-04	8.08E-04	6.73E-04	6.20E-04	3.69E-04	3.33E-04	3.67E-04	4.10E-04	4.47E-04	5.16E-04	5.86E-04	5.33E-04	3.59E-04	2.57E-04	2.32E-04	1.99E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.86E-05	6.21E-05	4.28E-05	3.23E-05	2.70E-05	4.03E-05	8.85E-05	2.08E-04	4.53E-04	4.04E-04	3.36E-04	3.10E-04	1.84E-04	1.66E-04	1.83E-04	2.05E-04	2.23E-04	2.58E-04	2.93E-04	2.67E-04	1.79E-04	1.28E-04	1.16E-04	9.96E-05
	Emission in each Box of 1st jet	g/s	1.57E-05	1.24E-05	8.57E-06	6.45E-06	5.41E-06	8.07E-06	1.77E-05	4.15E-05	9.07E-05	8.08E-05	6.73E-05	6.20E-05	3.69E-05	3.33E-05	3.67E-05	4.10E-05	4.47E-05	5.16E-05	5.86E-05	5.33E-05	3.59E-05	2.57E-05	2.32E-05	1.99E-05
	Emission in each Box of 2nd jet	g/s	7.86E-06	6.21E-06	4.28E-06	3.23E-06	2.70E-06	4.03E-06	8.85E-06	2.08E-05	4.53E-05	4.04E-05	3.36E-05	3.10E-05	1.84E-05	1.66E-05	1.83E-05	2.05E-05	2.23E-05	2.58E-05	2.93E-05	2.67E-05	1.79E-05	1.28E-05	1.16E-05	9.96E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1397	0.1190	0.1209	0.1267	0.1326	0.2452	0.2609	0.1969	0.2334	0.2184	0.2032	0.1975	0.1557	0.1500	0.1549	0.1638	0.1699	0.1784	0.1846	0.1752	0.1470	0.1341	0.1312	0.1282
	NO2	g/vehicle/km	0.0239	0.0230	0.0232	0.0237	0.0244	0.0305	0.0314	0.0293	0.0428	0.0398	0.0363	0.0348	0.0306	0.0292	0.0305	0.0326	0.0340	0.0360	0.0379	0.0359	0.0292	0.0254	0.0246	0.0242
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0040***	***0.0071***	***0.0064***	***0.0055***	***0.0051***	***0.0027***	***0.0024***	***0.0027***	***0.0030***	***0.0032***	***0.0036***	***0.0040***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.49E-04	5.93E-04	4.11E-04	3.20E-04	2.79E-04	6.19E-04	1.41E-03	2.66E-03	4.71E-03	4.29E-03	3.64E-03	3.39E-03	1.80E-03	1.62E-03	1.78E-03	1.97E-03	2.14E-03	2.42E-03	2.64E-03	2.40E-03	1.66E-03	1.25E-03	1.14E-03	9.75E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.24E-04	2.97E-04	2.05E-04	1.60E-04	1.40E-04	3.09E-04	7.05E-04	1.33E-03	2.36E-03	2.14E-03	1.82E-03	1.70E-03	8.99E-04	8.11E-04	8.88E-04	9.86E-04	1.07E-03	1.21E-03	1.32E-03	1.20E-03	8.31E-04	6.25E-04	5.70E-04	4.88E-04
	Emission in each Box of 1st jet	g/s	8.49E-05	5.93E-05	4.11E-05	3.20E-05	2.79E-05	6.19E-05	1.41E-04	2.66E-04	4.71E-04	4.29E-04	3.64E-04	3.39E-04	1.80E-04	1.62E-04	1.78E-04	1.97E-04	2.14E-04	2.42E-04	2.64E-04	2.40E-04	1.66E-04	1.25E-04	1.14E-04	9.75E-05
	Emission in each Box of 2nd jet	g/s	4.24E-05	2.97E-05	2.05E-05	1.60E-05	1.40E-05	3.09E-05	7.05E-05	1.33E-04	2.36E-04	2.14E-04	1.82E-04	1.70E-04	8.99E-05	8.11E-05	8.88E-05	9.86E-05	1.07E-04	1.21E-04	1.32E-04	1.20E-04	8.31E-05	6.25E-05	5.70E-05	4.88E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.45E-04	1.15E-04	7.89E-05	5.97E-05	5.14E-05	7.71E-05	1.70E-04	3.96E-04	8.65E-04	7.80E-04	6.50E-04	5.98E-04	3.53E-04	3.16E-04	3.50E-04	3.93E-04	4.28E-04	4.88E-04	5.43E-04	4.93E-04	3.30E-04	2.37E-04	2.14E-04	1.84E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.27E-05	5.74E-05	3.95E-05	2.99E-05	2.57E-05	3.85E-05	8.48E-05	1.98E-04	4.33E-04	3.90E-04	3.25E-04	2.99E-04	1.77E-04	1.58E-04	1.75E-04	1.96E-04	2.14E-04	2.44E-04	2.71E-04	2.46E-04	1.65E-04	1.18E-04	1.07E-04	9.19E-05
	Emission in each Box of 1st jet	g/s	1.45E-05	1.15E-05	7.89E-06	5.97E-06	5.14E-06	7.71E-06	1.70E-05	3.96E-05	8.65E-05	7.80E-05	6.50E-05	5.98E-05	3.53E-05	3.16E-05	3.50E-05	3.93E-05	4.28E-05	4.88E-05	5.43E-05	4.93E-05	3.30E-05	2.37E-05	2.14E-05	1.84E-05
	Emission in each Box of 2nd jet	g/s	7.27E-06	5.74E-06	3.95E-06	2.99E-06	2.57E-06	3.85E-06	8.48E-06	1.98E-05	4.33E-05	3.90E-05	3.25E-05	2.99E-05	1.77E-05	1.58E-05	1.75E-05	1.96E-05	2.14E-05	2.44E-05	2.71E-05	2.46E-05	1.65E-05	1.18E-05	1.07E-05	9.19E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involved	104P4
Road Located	123
Vehicle EF Adopted	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1409	0.1189	0.1208	0.1268	0.1301	0.2391	0.2524	0.1938	0.2291	0.2119	0.1924	0.1874	0.1472	0.1439	0.1475	0.1560	0.1626	0.1725	0.1834	0.1752	0.1488	0.1344	0.1337	0.1312
	NO2	g/vehicle/km	0.0242	0.0230	0.0232	0.0238	0.0241	0.0299	0.0305	0.0288	0.0421	0.0387	0.0346	0.0333	0.0292	0.0282	0.0293	0.0313	0.0328	0.0350	0.0378	0.0360	0.0295	0.0255	0.0251	0.0247
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0039***	***0.0069***	***0.0062***	***0.0052***	***0.0048***	***0.0025***	***0.0023***	***0.0025***	***0.0028***	***0.0031***	***0.0035***	***0.0039***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.56E-04	5.92E-04	4.11E-04	3.20E-04	2.74E-04	6.04E-04	1.36E-03	2.62E-03	4.63E-03	4.16E-03	3.45E-03	3.22E-03	1.70E-03	1.56E-03	1.69E-03	1.88E-03	2.05E-03	2.34E-03	2.63E-03	2.40E-03	1.68E-03	1.25E-03	1.16E-03	9.98E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.28E-04	2.96E-04	2.05E-04	1.60E-04	1.37E-04	3.02E-04	6.82E-04	1.31E-03	2.31E-03	2.08E-03	1.72E-03	1.61E-03	8.50E-04	7.78E-04	8.45E-04	9.39E-04	1.02E-03	1.17E-03	1.31E-03	1.20E-03	8.42E-04	6.26E-04	5.81E-04	4.99E-04
	Emission in each Box of 1st jet	g/s	8.56E-05	5.92E-05	4.11E-05	3.20E-05	2.74E-05	6.04E-05	1.36E-04	2.62E-04	4.63E-04	4.16E-04	3.45E-04	3.22E-04	1.70E-04	1.56E-04	1.69E-04	1.88E-04	2.05E-04	2.34E-04	2.63E-04	2.40E-04	1.68E-04	1.25E-04	1.16E-04	9.98E-05
	Emission in each Box of 2nd jet	g/s	4.28E-05	2.96E-05	2.05E-05	1.60E-05	1.37E-05	3.02E-05	6.82E-05	1.31E-04	2.31E-04	2.08E-04	1.72E-04	1.61E-04	8.50E-05	7.78E-05	8.45E-05	9.39E-05	1.02E-04	1.17E-04	1.31E-04	1.20E-04	8.42E-05	6.26E-05	5.81E-05	4.99E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0011***	***0.0009***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.47E-04	1.15E-04	7.90E-05	6.00E-05	5.06E-05	7.54E-05	1.65E-04	3.90E-04	8.51E-04	7.59E-04	6.20E-04	5.71E-04	3.37E-04	3.05E-04	3.36E-04	3.77E-04	4.12E-04	4.75E-04	5.41E-04	4.94E-04	3.34E-04	2.38E-04	2.18E-04	1.88E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.35E-05	5.74E-05	3.95E-05	3.00E-05	2.53E-05	3.77E-05	8.24E-05	1.95E-04	4.25E-04	3.79E-04	3.10E-04	2.86E-04	1.69E-04	1.53E-04	1.68E-04	1.88E-04	2.06E-04	2.37E-04	2.71E-04	2.47E-04	1.67E-04	1.19E-04	1.09E-04	9.39E-05
	Emission in each Box of 1st jet	g/s	1.47E-05	1.15E-05	7.90E-06	6.00E-06	5.06E-06	7.54E-06	1.65E-05	3.90E-05	8.51E-05	7.59E-05	6.20E-05	5.71E-05	3.37E-05	3.05E-05	3.36E-05	3.77E-05	4.12E-05	4.75E-05	5.41E-05	4.94E-05	3.34E-05	2.38E-05	2.18E-05	1.88E-05
	Emission in each Box of 2nd jet	g/s	7.35E-06	5.74E-06	3.95E-06	3.00E-06	2.53E-06	3.77E-06	8.24E-06	1.95E-05	4.25E-05	3.79E-05	3.10E-05	2.86E-05	1.69E-05	1.53E-05	1.68E-05	1.88E-05	2.06E-05	2.37E-05	2.71E-05	2.47E-05	1.67E-05	1.19E-05	1.09E-05	9.39E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1292	0.1103	0.1133	0.1188	0.1220	0.2271	0.2437	0.1934	0.2276	0.2114	0.1949	0.1876	0.1451	0.1423	0.1441	0.1526	0.1595	0.1669	0.1749	0.1649	0.1386	0.1248	0.1215	0.1167
	NO2	g/vehicle/km	0.0224	0.0217	0.0221	0.0225	0.0228	0.0285	0.0296	0.0289	0.0420	0.0387	0.0351	0.0334	0.0289	0.0280	0.0288	0.0307	0.0323	0.0341	0.0363	0.0341	0.0278	0.0239	0.0231	0.0223
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0012***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0009***	***0.0020***	***0.0039***	***0.0069***	***0.0062***	***0.0052***	***0.0048***	***0.0025***	***0.0023***	***0.0025***	***0.0028***	***0.0030***	***0.0034***	***0.0038***	***0.0034***	***0.0024***	***0.0017***	***0.0016***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.85E-04	5.49E-04	3.85E-04	3.00E-04	2.57E-04	5.73E-04	1.32E-03	2.61E-03	4.60E-03	4.15E-03	3.49E-03	3.22E-03	1.68E-03	1.54E-03	1.65E-03	1.84E-03	2.01E-03	2.26E-03	2.51E-03	2.26E-03	1.57E-03	1.16E-03	1.06E-03	8.88E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.92E-04	2.75E-04	1.93E-04	1.50E-04	1.28E-04	2.87E-04	6.58E-04	1.31E-03	2.30E-03	2.07E-03	1.75E-03	1.61E-03	8.38E-04	7.69E-04	8.26E-04	9.18E-04	1.00E-03	1.13E-03	1.25E-03	1.13E-03	7.84E-04	5.82E-04	5.28E-04	4.44E-04
	Emission in each Box of 1st jet	g/s	7.85E-05	5.49E-05	3.85E-05	3.00E-05	2.57E-05	5.73E-05	1.32E-04	2.61E-04	4.60E-04	4.15E-04	3.49E-04	3.22E-04	1.68E-04	1.54E-04	1.65E-04	1.84E-04	2.01E-04	2.26E-04	2.51E-04	2.26E-04	1.57E-04	1.16E-04	1.06E-04	8.88E-05
	Emission in each Box of 2nd jet	g/s	3.92E-05	2.75E-05	1.93E-05	1.50E-05	1.28E-05	2.87E-05	6.58E-05	1.31E-04	2.30E-04	2.07E-04	1.75E-04	1.61E-04	8.38E-05	7.69E-05	8.26E-05	9.18E-05	1.00E-04	1.13E-04	1.25E-04	1.13E-04	7.84E-05	5.82E-05	5.28E-05	4.44E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0011***	***0.0009***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.36E-04	1.08E-04	7.50E-05	5.68E-05	4.80E-05	7.20E-05	1.60E-04	3.90E-04	8.47E-04	7.60E-04	6.29E-04	5.74E-04	3.34E-04	3.03E-04	3.30E-04	3.70E-04	4.07E-04	4.62E-04	5.20E-04	4.68E-04	3.14E-04	2.23E-04	2.01E-04	1.70E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.81E-05	5.40E-05	3.75E-05	2.84E-05	2.40E-05	3.60E-05	7.99E-05	1.95E-04	4.24E-04	3.80E-04	3.15E-04	2.87E-04	1.67E-04	1.51E-04	1.65E-04	1.85E-04	2.04E-04	2.31E-04	2.60E-04	2.34E-04	1.57E-04	1.12E-04	1.00E-04	8.49E-05
	Emission in each Box of 1st jet	g/s	1.36E-05	1.08E-05	7.50E-06	5.68E-06	4.80E-06	7.20E-06	1.60E-05	3.90E-05	8.47E-05	7.60E-05	6.29E-05	5.74E-05	3.34E-05	3.03E-05	3.30E-05	3.70E-05	4.07E-05	4.62E-05	5.20E-05	4.68E-05	3.14E-05	2.23E-05	2.01E-05	1.70E-05
	Emission in each Box of 2nd jet	g/s	6.81E-06	5.40E-06	3.75E-06	2.84E-06	2.40E-06	3.60E-06	7.99E-06	1.95E-05	4.24E-05	3.80E-05	3.15E-05	2.87E-05	1.67E-05	1.51E-05	1.65E-05	1.85E-05	2.04E-05	2.31E-05	2.60E-05	2.34E-05	1.57E-05	1.12E-05	1.00E-05	8.49E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1243	0.1026	0.1037	0.1074	0.1100	0.2042	0.2159	0.1656	0.2005	0.1860	0.1735	0.1694	0.1330	0.1273	0.1325	0.1387	0.1428	0.1488	0.1565	0.1496	0.1269	0.1170	0.1149	0.1115
	NO2	g/vehicle/km	0.0216	0.0203	0.0204	0.0206	0.0208	0.0259	0.0264	0.0251	0.0374	0.0345	0.0316	0.0304	0.0267	0.0253	0.0266	0.0281	0.0292	0.0306	0.0327	0.0312	0.0257	0.0225	0.0219	0.0214
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0008***	***0.0017***	***0.0034***	***0.0061***	***0.0055***	***0.0047***	***0.0044***	***0.0023***	***0.0021***	***0.0023***	***0.0025***	***0.0027***	***0.0030***	***0.0034***	***0.0031***	***0.0022***	***0.0016***	***0.0015***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.56E-04	5.11E-04	3.53E-04	2.71E-04	2.31E-04	5.16E-04	1.17E-03	2.24E-03	4.05E-03	3.65E-03	3.11E-03	2.91E-03	1.54E-03	1.38E-03	1.52E-03	1.67E-03	1.80E-03	2.02E-03	2.24E-03	2.05E-03	1.44E-03	1.09E-03	9.98E-04	8.48E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.78E-04	2.56E-04	1.76E-04	1.36E-04	1.16E-04	2.58E-04	5.83E-04	1.12E-03	2.02E-03	1.83E-03	1.56E-03	1.45E-03	7.68E-04	6.88E-04	7.59E-04	8.35E-04	8.99E-04	1.01E-03	1.12E-03	1.03E-03	7.18E-04	5.46E-04	4.99E-04	4.24E-04
	Emission in each Box of 1st jet	g/s	7.56E-05	5.11E-05	3.53E-05	2.71E-05	2.31E-05	5.16E-05	1.17E-04	2.24E-04	4.05E-04	3.65E-04	3.11E-04	2.91E-04	1.54E-04	1.38E-04	1.52E-04	1.67E-04	1.80E-04	2.02E-04	2.24E-04	2.05E-04	1.44E-04	1.09E-04	9.98E-05	8.48E-05
	Emission in each Box of 2nd jet	g/s	3.78E-05	2.56E-05	1.76E-05	1.36E-05	1.16E-05	2.58E-05	5.83E-05	1.12E-04	2.02E-04	1.83E-04	1.56E-04	1.45E-04	7.68E-05	6.88E-05	7.59E-05	8.35E-05	8.99E-05	1.01E-04	1.12E-04	1.03E-04	7.18E-05	5.46E-05	4.99E-05	4.24E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.31E-04	1.01E-04	6.94E-05	5.21E-05	4.39E-05	6.53E-05	1.43E-04	3.39E-04	7.55E-04	6.76E-04	5.66E-04	5.22E-04	3.08E-04	2.73E-04	3.05E-04	3.39E-04	3.67E-04	4.15E-04	4.69E-04	4.28E-04	2.90E-04	2.10E-04	1.91E-04	1.63E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.57E-05	5.06E-05	3.47E-05	2.60E-05	2.19E-05	3.26E-05	7.14E-05	1.70E-04	3.77E-04	3.38E-04	2.83E-04	2.61E-04	1.54E-04	1.37E-04	1.53E-04	1.69E-04	1.84E-04	2.08E-04	2.35E-04	2.14E-04	1.45E-04	1.05E-04	9.53E-05	8.13E-05
	Emission in each Box of 1st jet	g/s	1.31E-05	1.01E-05	6.94E-06	5.21E-06	4.39E-06	6.53E-06	1.43E-05	3.39E-05	7.55E-05	6.76E-05	5.66E-05	5.22E-05	3.08E-05	2.73E-05	3.05E-05	3.39E-05	3.67E-05	4.15E-05	4.69E-05	4.28E-05	2.90E-05	2.10E-05	1.91E-05	1.63E-05
	Emission in each Box of 2nd jet	g/s	6.57E-06	5.06E-06	3.47E-06	2.60E-06	2.19E-06	3.26E-06	7.14E-06	1.70E-05	3.77E-05	3.38E-05	2.83E-05	2.61E-05	1.54E-05	1.37E-05	1.53E-05	1.69E-05	1.84E-05	2.08E-05	2.35E-05	2.14E-05	1.45E-05	1.05E-05	9.53E-06	8.13E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1130	0.0970	0.1009	0.1036	0.1056	0.1949	0.2059	0.1632	0.1998	0.1832	0.1704	0.1633	0.1281	0.1276	0.1311	0.1384	0.1418	0.1508	0.1626	0.1520	0.1285	0.1173	0.1138	0.1130
	NO2	g/vehicle/km	0.0199	0.0194	0.0199	0.0200	0.0201	0.0248	0.0253	0.0247	0.0372	0.0340	0.0311	0.0294	0.0258	0.0254	0.0264	0.0281	0.0290	0.0311	0.0339	0.0317	0.0260	0.0226	0.0217	0.0216
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0017***	***0.0033***	***0.0061***	***0.0054***	***0.0046***	***0.0042***	***0.0022***	***0.0021***	***0.0023***	***0.0025***	***0.0027***	***0.0031***	***0.0035***	***0.0031***	***0.0022***	***0.0016***	***0.0015***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.87E-04	4.83E-04	3.43E-04	2.62E-04	2.22E-04	4.92E-04	1.11E-03	2.21E-03	4.03E-03	3.60E-03	3.05E-03	2.80E-03	1.48E-03	1.38E-03	1.50E-03	1.67E-03	1.79E-03	2.04E-03	2.33E-03	2.08E-03	1.45E-03	1.09E-03	9.88E-04	8.59E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.43E-04	2.42E-04	1.72E-04	1.31E-04	1.11E-04	2.46E-04	5.56E-04	1.10E-03	2.02E-03	1.80E-03	1.53E-03	1.40E-03	7.40E-04	6.89E-04	7.51E-04	8.33E-04	8.93E-04	1.02E-03	1.16E-03	1.04E-03	7.27E-04	5.47E-04	4.94E-04	4.30E-04
	Emission in each Box of 1st jet	g/s	6.87E-05	4.83E-05	3.43E-05	2.62E-05	2.22E-05	4.92E-05	1.11E-04	2.21E-04	4.03E-04	3.60E-04	3.05E-04	2.80E-04	1.48E-04	1.38E-04	1.50E-04	1.67E-04	1.79E-04	2.04E-04	2.33E-04	2.08E-04	1.45E-04	1.09E-04	9.88E-05	8.59E-05
	Emission in each Box of 2nd jet	g/s	3.43E-05	2.42E-05	1.72E-05	1.31E-05	1.11E-05	2.46E-05	5.56E-05	1.10E-04	2.02E-04	1.80E-04	1.53E-04	1.40E-04	7.40E-05	6.89E-05	7.51E-05	8.33E-05	8.93E-05	1.02E-04	1.16E-04	1.04E-04	7.27E-05	5.47E-05	4.94E-05	4.30E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0007***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.21E-04	9.64E-05	6.77E-05	5.04E-05	4.23E-05	6.26E-05	1.37E-04	3.34E-04	7.52E-04	6.67E-04	5.57E-04	5.04E-04	2.98E-04	2.74E-04	3.02E-04	3.38E-04	3.64E-04	4.21E-04	4.85E-04	4.35E-04	2.94E-04	2.11E-04	1.89E-04	1.65E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.03E-05	4.82E-05	3.39E-05	2.52E-05	2.12E-05	3.13E-05	6.84E-05	1.67E-04	3.76E-04	3.33E-04	2.78E-04	2.52E-04	1.49E-04	1.37E-04	1.51E-04	1.69E-04	1.82E-04	2.11E-04	2.43E-04	2.18E-04	1.47E-04	1.05E-04	9.44E-05	8.23E-05
	Emission in each Box of 1st jet	g/s	1.21E-05	9.64E-06	6.77E-06	5.04E-06	4.23E-06	6.26E-06	1.37E-05	3.34E-05	7.52E-05	6.67E-05	5.57E-05	5.04E-05	2.98E-05	2.74E-05	3.02E-05	3.38E-05	3.64E-05	4.21E-05	4.85E-05	4.35E-05	2.94E-05	2.11E-05	1.89E-05	1.65E-05
	Emission in each Box of 2nd jet	g/s	6.03E-06	4.82E-06	3.39E-06	2.52E-06	2.12E-06	3.13E-06	6.84E-06	1.67E-05	3.76E-05	3.33E-05	2.78E-05	2.52E-05	1.49E-05	1.37E-05	1.51E-05	1.69E-05	1.82E-05	2.11E-05	2.43E-05	2.18E-05	1.47E-05	1.05E-05	9.44E-06	8.23E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1105	0.0936	0.0967	0.0991	0.0996	0.1900	0.1977	0.1556	0.1891	0.1833	0.1732	0.1714	0.1330	0.1297	0.1338	0.1424	0.1405	0.1488	0.1572	0.1460	0.1201	0.1096	0.1065	0.1026
	NO2	g/vehicle/km	0.0194	0.0187	0.0191	0.0192	0.0190	0.0241	0.0243	0.0236	0.0354	0.0340	0.0315	0.0308	0.0267	0.0257	0.0269	0.0289	0.0287	0.0307	0.0329	0.0305	0.0243	0.0212	0.0205	0.0198
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0016***	***0.0032***	***0.0057***	***0.0054***	***0.0047***	***0.0044***	***0.0023***	***0.0021***	***0.0023***	***0.0026***	***0.0027***	***0.0030***	***0.0034***	***0.0030***	***0.0020***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.72E-04	4.66E-04	3.29E-04	2.50E-04	2.09E-04	4.80E-04	1.07E-03	2.10E-03	3.82E-03	3.60E-03	3.10E-03	2.94E-03	1.54E-03	1.40E-03	1.53E-03	1.71E-03	1.77E-03	2.02E-03	2.25E-03	2.00E-03	1.36E-03	1.02E-03	9.25E-04	7.80E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.36E-04	2.33E-04	1.64E-04	1.25E-04	1.05E-04	2.40E-04	5.34E-04	1.05E-03	1.91E-03	1.80E-03	1.55E-03	1.47E-03	7.68E-04	7.01E-04	7.67E-04	8.57E-04	8.85E-04	1.01E-03	1.13E-03	1.00E-03	6.79E-04	5.11E-04	4.62E-04	3.90E-04
	Emission in each Box of 1st jet	g/s	6.72E-05	4.66E-05	3.29E-05	2.50E-05	2.09E-05	4.80E-05	1.07E-04	2.10E-04	3.82E-04	3.60E-04	3.10E-04	2.94E-04	1.54E-04	1.40E-04	1.53E-04	1.71E-04	1.77E-04	2.02E-04	2.25E-04	2.00E-04	1.36E-04	1.02E-04	9.25E-05	7.80E-05
	Emission in each Box of 2nd jet	g/s	3.36E-05	2.33E-05	1.64E-05	1.25E-05	1.05E-05	2.40E-05	5.34E-05	1.05E-04	1.91E-04	1.80E-04	1.55E-04	1.47E-04	7.68E-05	7.01E-05	7.67E-05	8.57E-05	8.85E-05	1.01E-04	1.13E-04	1.00E-04	6.79E-05	5.11E-05	4.62E-05	3.90E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.18E-04	9.31E-05	6.50E-05	4.84E-05	4.00E-05	6.09E-05	1.31E-04	3.19E-04	7.15E-04	6.67E-04	5.65E-04	5.28E-04	3.08E-04	2.78E-04	3.08E-04	3.48E-04	3.61E-04	4.16E-04	4.71E-04	4.18E-04	2.75E-04	1.98E-04	1.78E-04	1.51E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.89E-05	4.66E-05	3.25E-05	2.42E-05	2.00E-05	3.04E-05	6.57E-05	1.60E-04	3.58E-04	3.33E-04	2.82E-04	2.64E-04	1.54E-04	1.39E-04	1.54E-04	1.74E-04	1.81E-04	2.08E-04	2.35E-04	2.09E-04	1.38E-04	9.90E-05	8.90E-05	7.55E-05
	Emission in each Box of 1st jet	g/s	1.18E-05	9.31E-06	6.50E-06	4.84E-06	4.00E-06	6.09E-06	1.31E-05	3.19E-05	7.15E-05	6.67E-05	5.65E-05	5.28E-05	3.08E-05	2.78E-05	3.08E-05	3.48E-05	3.61E-05	4.16E-05	4.71E-05	4.18E-05	2.75E-05	1.98E-05	1.78E-05	1.51E-05
	Emission in each Box of 2nd jet	g/s	5.89E-06	4.66E-06	3.25E-06	2.42E-06	2.00E-06	3.04E-06	6.57E-06	1.60E-05	3.58E-05	3.33E-05	2.82E-05	2.64E-05	1.54E-05	1.39E-05	1.54E-05	1.74E-05	1.81E-05	2.08E-05	2.35E-05	2.09E-05	1.38E-05	9.90E-06	8.90E-06	7.55E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1169	0.0962	0.1000	0.1045	0.1056	0.1941	0.2051	0.1548	0.1910	0.1796	0.1693	0.1640	0.1292	0.1295	0.1340	0.1405	0.1501	0.1560	0.1662	0.1546	0.1259	0.1112	0.1106	0.1081
	NO2	g/vehicle/km	0.0205	0.0192	0.0198	0.0201	0.0201	0.0247	0.0252	0.0235	0.0357	0.0334	0.0309	0.0295	0.0260	0.0257	0.0269	0.0285	0.0306	0.0321	0.0346	0.0322	0.0255	0.0215	0.0212	0.0208
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0017***	***0.0031***	***0.0058***	***0.0053***	***0.0046***	***0.0042***	***0.0022***	***0.0021***	***0.0023***	***0.0025***	***0.0028***	***0.0032***	***0.0036***	***0.0032***	***0.0021***	***0.0016***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.11E-04	4.79E-04	3.40E-04	2.64E-04	2.22E-04	4.90E-04	1.11E-03	2.09E-03	3.86E-03	3.53E-03	3.03E-03	2.82E-03	1.49E-03	1.40E-03	1.54E-03	1.69E-03	1.89E-03	2.11E-03	2.38E-03	2.12E-03	1.42E-03	1.04E-03	9.60E-04	8.22E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.55E-04	2.40E-04	1.70E-04	1.32E-04	1.11E-04	2.45E-04	5.54E-04	1.05E-03	1.93E-03	1.76E-03	1.52E-03	1.41E-03	7.46E-04	6.99E-04	7.68E-04	8.45E-04	9.45E-04	1.06E-03	1.19E-03	1.06E-03	7.12E-04	5.19E-04	4.80E-04	4.11E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.79E-05	3.40E-05	2.64E-05	2.22E-05	4.90E-05	1.11E-04	2.09E-04	3.86E-04	3.53E-04	3.03E-04	2.82E-04	1.49E-04	1.40E-04	1.54E-04	1.69E-04	1.89E-04	2.11E-04	2.38E-04	2.12E-04	1.42E-04	1.04E-04	9.60E-05	8.22E-05
	Emission in each Box of 2nd jet	g/s	3.55E-05	2.40E-05	1.70E-05	1.32E-05	1.11E-05	2.45E-05	5.54E-05	1.05E-04	1.93E-04	1.76E-04	1.52E-04	1.41E-04	7.46E-05	6.99E-05	7.68E-05	8.45E-05	9.45E-05	1.06E-04	1.19E-04	1.06E-04	7.12E-05	5.19E-05	4.80E-05	4.11E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0007***	***0.0007***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.24E-04	9.57E-05	6.73E-05	5.08E-05	4.23E-05	6.23E-05	1.36E-04	3.18E-04	7.22E-04	6.55E-04	5.53E-04	5.06E-04	3.00E-04	2.78E-04	3.08E-04	3.43E-04	3.85E-04	4.34E-04	4.95E-04	4.42E-04	2.88E-04	2.01E-04	1.84E-04	1.58E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.22E-05	4.79E-05	3.36E-05	2.54E-05	2.12E-05	3.11E-05	6.81E-05	1.59E-04	3.61E-04	3.27E-04	2.77E-04	2.53E-04	1.50E-04	1.39E-04	1.54E-04	1.71E-04	1.92E-04	2.17E-04	2.48E-04	2.21E-04	1.44E-04	1.00E-04	9.21E-05	7.91E-05
	Emission in each Box of 1st jet	g/s	1.24E-05	9.57E-06	6.73E-06	5.08E-06	4.23E-06	6.23E-06	1.36E-05	3.18E-05	7.22E-05	6.55E-05	5.53E-05	5.06E-05	3.00E-05	2.78E-05	3.08E-05	3.43E-05	3.85E-05	4.34E-05	4.95E-05	4.42E-05	2.88E-05	2.01E-05	1.84E-05	1.58E-05
	Emission in each Box of 2nd jet	g/s	6.22E-06	4.79E-06	3.36E-06	2.54E-06	2.12E-06	3.11E-06	6.81E-06	1.59E-05	3.61E-05	3.27E-05	2.77E-05	2.53E-05	1.50E-05	1.39E-05	1.54E-05	1.71E-05	1.92E-05	2.17E-05	2.48E-05	2.21E-05	1.44E-05	1.00E-05	9.21E-06	7.91E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1161	0.0984	0.0986	0.1002	0.1051	0.1890	0.2006	0.1522	0.1827	0.1716	0.1678	0.1566	0.1271	0.1258	0.1330	0.1332	0.1349	0.1475	0.1586	0.1475	0.1258	0.1124	0.1103	0.1069
	NO2	g/vehicle/km	0.0203	0.0196	0.0195	0.0193	0.0200	0.0240	0.0246	0.0231	0.0343	0.0319	0.0306	0.0282	0.0256	0.0250	0.0267	0.0271	0.0277	0.0304	0.0331	0.0308	0.0255	0.0217	0.0212	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0016***	***0.0031***	***0.0055***	***0.0051***	***0.0045***	***0.0040***	***0.0022***	***0.0020***	***0.0023***	***0.0024***	***0.0025***	***0.0030***	***0.0034***	***0.0030***	***0.0021***	***0.0016***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.05E-04	4.90E-04	3.35E-04	2.53E-04	2.21E-04	4.77E-04	1.08E-03	2.06E-03	3.69E-03	3.37E-03	3.01E-03	2.69E-03	1.47E-03	1.36E-03	1.52E-03	1.60E-03	1.70E-03	2.00E-03	2.27E-03	2.02E-03	1.42E-03	1.05E-03	9.58E-04	8.13E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.53E-04	2.45E-04	1.68E-04	1.26E-04	1.11E-04	2.39E-04	5.42E-04	1.03E-03	1.85E-03	1.68E-03	1.50E-03	1.34E-03	7.34E-04	6.80E-04	7.62E-04	8.01E-04	8.49E-04	9.99E-04	1.14E-03	1.01E-03	7.12E-04	5.24E-04	4.79E-04	4.06E-04
	Emission in each Box of 1st jet	g/s	7.05E-05	4.90E-05	3.35E-05	2.53E-05	2.21E-05	4.77E-05	1.08E-04	2.06E-04	3.69E-04	3.37E-04	3.01E-04	2.69E-04	1.47E-04	1.36E-04	1.52E-04	1.60E-04	1.70E-04	2.00E-04	2.27E-04	2.02E-04	1.42E-04	1.05E-04	9.58E-05	8.13E-05
	Emission in each Box of 2nd jet	g/s	3.53E-05	2.45E-05	1.68E-05	1.26E-05	1.11E-05	2.39E-05	5.42E-05	1.03E-04	1.85E-04	1.68E-04	1.50E-04	1.34E-04	7.34E-05	6.80E-05	7.62E-05	8.01E-05	8.49E-05	9.99E-05	1.14E-04	1.01E-04	7.12E-05	5.24E-05	4.79E-05	4.06E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0010***	***0.0009***	***0.0008***	***0.0007***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.24E-04	9.77E-05	6.64E-05	4.88E-05	4.21E-05	6.06E-05	1.33E-04	3.13E-04	6.93E-04	6.26E-04	5.49E-04	4.85E-04	2.96E-04	2.70E-04	3.06E-04	3.26E-04	3.48E-04	4.12E-04	4.75E-04	4.22E-04	2.88E-04	2.03E-04	1.84E-04	1.57E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.18E-05	4.88E-05	3.32E-05	2.44E-05	2.11E-05	3.03E-05	6.66E-05	1.56E-04	3.46E-04	3.13E-04	2.74E-04	2.42E-04	1.48E-04	1.35E-04	1.53E-04	1.63E-04	1.74E-04	2.06E-04	2.37E-04	2.11E-04	1.44E-04	1.01E-04	9.19E-05	7.83E-05
	Emission in each Box of 1st jet	g/s	1.24E-05	9.77E-06	6.64E-06	4.88E-06	4.21E-06	6.06E-06	1.33E-05	3.13E-05	6.93E-05	6.26E-05	5.49E-05	4.85E-05	2.96E-05	2.70E-05	3.06E-05	3.26E-05	3.48E-05	4.12E-05	4.75E-05	4.22E-05	2.88E-05	2.03E-05	1.84E-05	1.57E-05
	Emission in each Box of 2nd jet	g/s	6.18E-06	4.88E-06	3.32E-06	2.44E-06	2.11E-06	3.03E-06	6.66E-06	1.56E-05	3.46E-05	3.13E-05	2.74E-05	2.42E-05	1.48E-05	1.35E-05	1.53E-05	1.63E-05	1.74E-05	2.06E-05	2.37E-05	2.11E-05	1.44E-05	1.01E-05	9.19E-06	7.83E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1327	0.1142	0.1151	0.1188	0.1221	0.2286	0.2401	0.1827	0.2185	0.2027	0.1881	0.1840	0.1458	0.1411	0.1438	0.1538	0.1562	0.1661	0.1786	0.1674	0.1422	0.1269	0.1259	0.1243
	NO2	g/vehicle/km	0.0229	0.0223	0.0223	0.0225	0.0228	0.0286	0.0291	0.0274	0.0404	0.0372	0.0340	0.0328	0.0290	0.0278	0.0287	0.0309	0.0316	0.0339	0.0369	0.0346	0.0284	0.0242	0.0238	0.0235
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0009***	***0.0019***	***0.0037***	***0.0066***	***0.0060***	***0.0051***	***0.0047***	***0.0025***	***0.0023***	***0.0025***	***0.0028***	***0.0030***	***0.0034***	***0.0038***	***0.0034***	***0.0024***	***0.0018***	***0.0016***	***0.0014***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.07E-04	5.69E-04	3.91E-04	3.00E-04	2.57E-04	5.77E-04	1.30E-03	2.47E-03	4.41E-03	3.98E-03	3.37E-03	3.16E-03	1.68E-03	1.52E-03	1.65E-03	1.85E-03	1.97E-03	2.25E-03	2.56E-03	2.30E-03	1.61E-03	1.18E-03	1.09E-03	9.46E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.03E-04	2.84E-04	1.96E-04	1.50E-04	1.28E-04	2.89E-04	6.49E-04	1.23E-03	2.21E-03	1.99E-03	1.69E-03	1.58E-03	8.41E-04	7.62E-04	8.24E-04	9.25E-04	9.83E-04	1.13E-03	1.28E-03	1.15E-03	8.04E-04	5.92E-04	5.47E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	8.07E-05	5.69E-05	3.91E-05	3.00E-05	2.57E-05	5.77E-05	1.30E-04	2.47E-04	4.41E-04	3.98E-04	3.37E-04	3.16E-04	1.68E-04	1.52E-04	1.65E-04	1.85E-04	1.97E-04	2.25E-04	2.56E-04	2.30E-04	1.61E-04	1.18E-04	1.09E-04	9.46E-05
	Emission in each Box of 2nd jet	g/s	4.03E-05	2.84E-05	1.96E-05	1.50E-05	1.28E-05	2.89E-05	6.49E-05	1.23E-04	2.21E-04	1.99E-04	1.69E-04	1.58E-04	8.41E-05	7.62E-05	8.24E-05	9.25E-05	9.83E-05	1.13E-04	1.28E-04	1.15E-04	8.04E-05	5.92E-05	5.47E-05	4.73E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.39E-04	1.11E-04	7.60E-05	5.68E-05	4.79E-05	7.23E-05	1.57E-04	3.70E-04	8.15E-04	7.30E-04	6.09E-04	5.63E-04	3.35E-04	3.00E-04	3.29E-04	3.72E-04	3.98E-04	4.60E-04	5.28E-04	4.75E-04	3.21E-04	2.26E-04	2.07E-04	1.79E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.96E-05	5.55E-05	3.80E-05	2.84E-05	2.40E-05	3.61E-05	7.87E-05	1.85E-04	4.08E-04	3.65E-04	3.05E-04	2.82E-04	1.67E-04	1.50E-04	1.64E-04	1.86E-04	1.99E-04	2.30E-04	2.64E-04	2.37E-04	1.60E-04	1.13E-04	1.03E-04	8.95E-05
	Emission in each Box of 1st jet	g/s	1.39E-05	1.11E-05	7.60E-06	5.68E-06	4.79E-06	7.23E-06	1.57E-05	3.70E-05	8.15E-05	7.30E-05	6.09E-05	5.63E-05	3.35E-05	3.00E-05	3.29E-05	3.72E-05	3.98E-05	4.60E-05	5.28E-05	4.75E-05	3.21E-05	2.26E-05	2.07E-05	1.79E-05
	Emission in each Box of 2nd jet	g/s	6.96E-06	5.55E-06	3.80E-06	2.84E-06	2.40E-06	3.61E-06	7.87E-06	1.85E-05	4.08E-05	3.65E-05	3.05E-05	2.82E-05	1.67E-05	1.50E-05	1.64E-05	1.86E-05	1.99E-05	2.30E-05	2.64E-05	2.37E-05	1.60E-05	1.13E-05	1.03E-05	8.95E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1457	0.1228	0.1259	0.1306	0.1339	0.2477	0.2629	0.1980	0.2369	0.2191	0.2042	0.1967	0.1570	0.1534	0.1570	0.1650	0.1682	0.1777	0.1908	0.1822	0.1528	0.1393	0.1373	0.1349
	NO2	g/vehicle/km	0.0249	0.0238	0.0241	0.0244	0.0247	0.0308	0.0317	0.0295	0.0434	0.0399	0.0365	0.0348	0.0309	0.0298	0.0310	0.0329	0.0337	0.0360	0.0391	0.0373	0.0303	0.0263	0.0257	0.0253
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0040***	***0.0072***	***0.0064***	***0.0055***	***0.0051***	***0.0027***	***0.0025***	***0.0027***	***0.0030***	***0.0032***	***0.0036***	***0.0041***	***0.0037***	***0.0026***	***0.0019***	***0.0018***	***0.0015***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.85E-04	6.12E-04	4.28E-04	3.30E-04	2.82E-04	6.25E-04	1.42E-03	2.68E-03	4.79E-03	4.30E-03	3.66E-03	3.38E-03	1.81E-03	1.66E-03	1.80E-03	1.99E-03	2.12E-03	2.41E-03	2.73E-03	2.50E-03	1.73E-03	1.30E-03	1.19E-03	1.03E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.43E-04	3.06E-04	2.14E-04	1.65E-04	1.41E-04	3.13E-04	7.10E-04	1.34E-03	2.39E-03	2.15E-03	1.83E-03	1.69E-03	9.06E-04	8.29E-04	9.00E-04	9.93E-04	1.06E-03	1.20E-03	1.37E-03	1.25E-03	8.64E-04	6.49E-04	5.96E-04	5.13E-04
	Emission in each Box of 1st jet	g/s	8.85E-05	6.12E-05	4.28E-05	3.30E-05	2.82E-05	6.25E-05	1.42E-04	2.68E-04	4.79E-04	4.30E-04	3.66E-04	3.38E-04	1.81E-04	1.66E-04	1.80E-04	1.99E-04	2.12E-04	2.41E-04	2.73E-04	2.50E-04	1.73E-04	1.30E-04	1.19E-04	1.03E-04
	Emission in each Box of 2nd jet	g/s	4.43E-05	3.06E-05	2.14E-05	1.65E-05	1.41E-05	3.13E-05	7.10E-05	1.34E-04	2.39E-04	2.15E-04	1.83E-04	1.69E-04	9.06E-05	8.29E-05	9.00E-05	9.93E-05	1.06E-04	1.20E-04	1.37E-04	1.25E-04	8.64E-05	6.49E-05	5.96E-05	5.13E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.51E-04	1.18E-04	8.19E-05	6.16E-05	5.19E-05	7.79E-05	1.71E-04	3.99E-04	8.76E-04	7.83E-04	6.54E-04	5.97E-04	3.56E-04	3.22E-04	3.55E-04	3.96E-04	4.25E-04	4.87E-04	5.60E-04	5.11E-04	3.42E-04	2.45E-04	2.23E-04	1.92E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.55E-05	5.92E-05	4.10E-05	3.08E-05	2.60E-05	3.89E-05	8.56E-05	1.99E-04	4.38E-04	3.92E-04	3.27E-04	2.98E-04	1.78E-04	1.61E-04	1.77E-04	1.98E-04	2.12E-04	2.44E-04	2.80E-04	2.56E-04	1.71E-04	1.23E-04	1.12E-04	9.61E-05
	Emission in each Box of 1st jet	g/s	1.51E-05	1.18E-05	8.19E-06	6.16E-06	5.19E-06	7.79E-06	1.71E-05	3.99E-05	8.76E-05	7.83E-05	6.54E-05	5.97E-05	3.56E-05	3.22E-05	3.55E-05	3.96E-05	4.25E-05	4.87E-05	5.60E-05	5.11E-05	3.42E-05	2.45E-05	2.23E-05	1.92E-05
	Emission in each Box of 2nd jet	g/s	7.55E-06	5.92E-06	4.10E-06	3.08E-06	2.60E-06	3.89E-06	8.56E-06	1.99E-05	4.38E-05	3.92E-05	3.27E-05	2.98E-05	1.78E-05	1.61E-05	1.77E-05	1.98E-05	2.12E-05	2.44E-05	2.80E-05	2.56E-05	1.71E-05	1.23E-05	1.12E-05	9.61E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1519	0.1290	0.1322	0.1374	0.1401	0.2559	0.2716	0.2061	0.2448	0.2261	0.2107	0.2045	0.1626	0.1579	0.1617	0.1704	0.1748	0.1867	0.1980	0.1888	0.1588	0.1447	0.1430	0.1409
	NO2	g/vehicle/km	0.0257	0.0246	0.0249	0.0253	0.0255	0.0317	0.0325	0.0304	0.0444	0.0409	0.0373	0.0358	0.0317	0.0305	0.0316	0.0336	0.0348	0.0374	0.0402	0.0383	0.0311	0.0270	0.0264	0.0261
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0010***	***0.0022***	***0.0042***	***0.0074***	***0.0067***	***0.0057***	***0.0053***	***0.0028***	***0.0026***	***0.0028***	***0.0031***	***0.0033***	***0.0038***	***0.0043***	***0.0039***	***0.0027***	***0.0020***	***0.0019***	***0.0016***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.23E-04	6.43E-04	4.49E-04	3.47E-04	2.95E-04	6.46E-04	1.47E-03	2.78E-03	4.94E-03	4.44E-03	3.78E-03	3.51E-03	1.88E-03	1.71E-03	1.85E-03	2.05E-03	2.20E-03	2.53E-03	2.84E-03	2.59E-03	1.80E-03	1.35E-03	1.24E-03	1.07E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.62E-04	3.21E-04	2.25E-04	1.73E-04	1.47E-04	3.23E-04	7.34E-04	1.39E-03	2.47E-03	2.22E-03	1.89E-03	1.76E-03	9.39E-04	8.53E-04	9.27E-04	1.03E-03	1.10E-03	1.26E-03	1.42E-03	1.29E-03	8.98E-04	6.75E-04	6.21E-04	5.36E-04
	Emission in each Box of 1st jet	g/s	9.23E-05	6.43E-05	4.49E-05	3.47E-05	2.95E-05	6.46E-05	1.47E-04	2.78E-04	4.94E-04	4.44E-04	3.78E-04	3.51E-04	1.88E-04	1.71E-04	1.85E-04	2.05E-04	2.20E-04	2.53E-04	2.84E-04	2.59E-04	1.80E-04	1.35E-04	1.24E-04	1.07E-04
	Emission in each Box of 2nd jet	g/s	4.62E-05	3.21E-05	2.25E-05	1.73E-05	1.47E-05	3.23E-05	7.34E-05	1.39E-04	2.47E-04	2.22E-04	1.89E-04	1.76E-04	9.39E-05	8.53E-05	9.27E-05	1.03E-04	1.10E-04	1.26E-04	1.42E-04	1.29E-04	8.98E-05	6.75E-05	6.21E-05	5.36E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0008***	***0.0009***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.56E-04	1.23E-04	8.48E-05	6.38E-05	5.36E-05	7.99E-05	1.76E-04	4.11E-04	8.97E-04	8.02E-04	6.69E-04	6.15E-04	3.65E-04	3.29E-04	3.63E-04	4.05E-04	4.38E-04	5.07E-04	5.75E-04	5.25E-04	3.52E-04	2.52E-04	2.30E-04	1.99E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.80E-05	6.13E-05	4.24E-05	3.19E-05	2.68E-05	4.00E-05	8.78E-05	2.05E-04	4.49E-04	4.01E-04	3.35E-04	3.07E-04	1.83E-04	1.65E-04	1.81E-04	2.02E-04	2.19E-04	2.53E-04	2.88E-04	2.62E-04	1.76E-04	1.26E-04	1.15E-04	9.94E-05
	Emission in each Box of 1st jet	g/s	1.56E-05	1.23E-05	8.48E-06	6.38E-06	5.36E-06	7.99E-06	1.76E-05	4.11E-05	8.97E-05	8.02E-05	6.69E-05	6.15E-05	3.65E-05	3.29E-05	3.63E-05	4.05E-05	4.38E-05	5.07E-05	5.75E-05	5.25E-05	3.52E-05	2.52E-05	2.30E-05	1.99E-05
	Emission in each Box of 2nd jet	g/s	7.80E-06	6.13E-06	4.24E-06	3.19E-06	2.68E-06	4.00E-06	8.78E-06	2.05E-05	4.49E-05	4.01E-05	3.35E-05	3.07E-05	1.83E-05	1.65E-05	1.81E-05	2.02E-05	2.19E-05	2.53E-05	2.88E-05	2.62E-05	1.76E-05	1.26E-05	1.15E-05	9.94E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1995	0.1521	0.1574	0.1697	0.1812	0.4129	0.4397	0.2977	0.2228	0.2196	0.2235	0.2292	0.1683	0.1707	0.1679	0.1687	0.1677	0.1674	0.1651	0.1614	0.1661	0.1746	0.1739	0.1684
	NO2	g/vehicle/km	0.0297	0.0277	0.0286	0.0296	0.0302	0.0420	0.0431	0.0350	0.0311	0.0309	0.0312	0.0316	0.0285	0.0287	0.0285	0.0285	0.0284	0.0284	0.0282	0.0280	0.0283	0.0288	0.0286	0.0282
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0071***	***0.0044***	***0.0031***	***0.0025***	***0.0022***	***0.0066***	***0.0150***	***0.0241***	***0.0264***	***0.0252***	***0.0235***	***0.0231***	***0.0158***	***0.0150***	***0.0157***	***0.0165***	***0.0172***	***0.0185***	***0.0193***	***0.0181***	***0.0153***	***0.0131***	***0.0122***	***0.0105***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.72E-03	2.90E-03	2.09E-03	1.68E-03	1.50E-03	4.39E-03	1.00E-02	1.60E-02	1.76E-02	1.68E-02	1.57E-02	1.54E-02	1.05E-02	9.99E-03	1.04E-02	1.10E-02	1.15E-02	1.23E-02	1.29E-02	1.21E-02	1.02E-02	8.76E-03	8.16E-03	6.98E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.36E-03	1.45E-03	1.04E-03	8.38E-04	7.49E-04	2.20E-03	5.00E-03	8.02E-03	8.80E-03	8.40E-03	7.85E-03	7.71E-03	5.27E-03	5.00E-03	5.22E-03	5.51E-03	5.73E-03	6.17E-03	6.43E-03	6.04E-03	5.09E-03	4.38E-03	4.08E-03	3.49E-03
	Emission in each Box of 1st jet	g/s	2.36E-03	1.45E-03	1.04E-03	8.38E-04	7.49E-04	2.20E-03	5.00E-03	8.02E-03	8.80E-03	8.40E-03	7.85E-03	7.71E-03	5.27E-03	5.00E-03	5.22E-03	5.51E-03	5.73E-03	6.17E-03	6.43E-03	6.04E-03	5.09E-03	4.38E-03	4.08E-03	3.49E-03
	Emission in each Box of 2nd jet	g/s	2.36E-03	1.45E-03	1.04E-03	8.38E-04	7.49E-04	2.20E-03	5.00E-03	8.02E-03	8.80E-03	8.40E-03	7.85E-03	7.71E-03	5.27E-03	5.00E-03	5.22E-03	5.51E-03	5.73E-03	6.17E-03	6.43E-03	6.04E-03	5.09E-03	4.38E-03	4.08E-03	3.49E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0007***	***0.0015***	***0.0028***	***0.0037***	***0.0035***	***0.0033***	***0.0032***	***0.0027***	***0.0025***	***0.0027***	***0.0028***	***0.0029***	***0.0031***	***0.0033***	***0.0031***	***0.0026***	***0.0022***	***0.0020***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.03E-04	5.30E-04	3.79E-04	2.93E-04	2.50E-04	4.47E-04	9.82E-04	1.89E-03	2.46E-03	2.37E-03	2.19E-03	2.13E-03	1.79E-03	1.68E-03	1.77E-03	1.86E-03	1.94E-03	2.09E-03	2.19E-03	2.09E-03	1.73E-03	1.44E-03	1.34E-03	1.17E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.51E-04	2.65E-04	1.90E-04	1.46E-04	1.25E-04	2.24E-04	4.91E-04	9.44E-04	1.23E-03	1.18E-03	1.10E-03	1.06E-03	8.94E-04	8.40E-04	8.87E-04	9.31E-04	9.70E-04	1.04E-03	1.10E-03	1.05E-03	8.66E-04	7.22E-04	6.71E-04	5.84E-04
	Emission in each Box of 1st jet	g/s	3.51E-04	2.65E-04	1.90E-04	1.46E-04	1.25E-04	2.24E-04	4.91E-04	9.44E-04	1.23E-03	1.18E-03	1.10E-03	1.06E-03	8.94E-04	8.40E-04	8.87E-04	9.31E-04	9.70E-04	1.04E-03	1.10E-03	1.05E-03	8.66E-04	7.22E-04	6.71E-04	5.84E-04
	Emission in each Box of 2nd jet	g/s	3.51E-04	2.65E-04	1.90E-04	1.46E-04	1.25E-04	2.24E-04	4.91E-04	9.44E-04	1.23E-03	1.18E-03	1.10E-03	1.06E-03	8.94E-04	8.40E-04	8.87E-04	9.31E-04	9.70E-04	1.04E-03	1.10E-03	1.05E-03	8.66E-04	7.22E-04	6.71E-04	5.84E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

Month		Unit	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1823	0.1378	0.1421	0.1540	0.1692	0.3919	0.4194	0.2813	0.2103	0.2100	0.2146	0.2189	0.1597	0.1599	0.1584	0.1596	0.1586	0.1564	0.1505	0.1468	0.1504	0.1587	0.1582	0.1530
	NO2	g/vehicle/km	0.0274	0.0256	0.0263	0.0275	0.0287	0.0402	0.0414	0.0334	0.0297	0.0298	0.0302	0.0304	0.0274	0.0273	0.0273	0.0273	0.0272	0.0268	0.0260	0.0258	0.0260	0.0266	0.0264	0.0260
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0065***	***0.0039***	***0.0028***	***0.0023***	***0.0021***	***0.0063***	***0.0143***	***0.0227***	***0.0249***	***0.0241***	***0.0226***	***0.0221***	***0.0150***	***0.0140***	***0.0148***	***0.0156***	***0.0163***	***0.0173***	***0.0176***	***0.0165***	***0.0138***	***0.0119***	***0.0111***	***0.0095***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.31E-03	2.63E-03	1.88E-03	1.52E-03	1.40E-03	4.17E-03	9.54E-03	1.52E-02	1.66E-02	1.61E-02	1.51E-02	1.47E-02	1.00E-02	9.36E-03	9.84E-03	1.04E-02	1.08E-02	1.15E-02	1.17E-02	1.10E-02	9.22E-03	7.96E-03	7.42E-03	6.34E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.16E-03	1.32E-03	9.42E-04	7.60E-04	7.00E-04	2.09E-03	4.77E-03	7.58E-03	8.31E-03	8.04E-03	7.53E-03	7.36E-03	5.00E-03	4.68E-03	4.92E-03	5.21E-03	5.42E-03	5.76E-03	5.86E-03	5.49E-03	4.61E-03	3.98E-03	3.71E-03	3.17E-03
	Emission in each Box of 1st jet	g/s	2.16E-03	1.32E-03	9.42E-04	7.60E-04	7.00E-04	2.09E-03	4.77E-03	7.58E-03	8.31E-03	8.04E-03	7.53E-03	7.36E-03	5.00E-03	4.68E-03	4.92E-03	5.21E-03	5.42E-03	5.76E-03	5.86E-03	5.49E-03	4.61E-03	3.98E-03	3.71E-03	3.17E-03
	Emission in each Box of 2nd jet	g/s	2.16E-03	1.32E-03	9.42E-04	7.60E-04	7.00E-04	2.09E-03	4.77E-03	7.58E-03	8.31E-03	8.04E-03	7.53E-03	7.36E-03	5.00E-03	4.68E-03	4.92E-03	5.21E-03	5.42E-03	5.76E-03	5.86E-03	5.49E-03	4.61E-03	3.98E-03	3.71E-03	3.17E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0027***	***0.0035***	***0.0034***	***0.0032***	***0.0031***	***0.0026***	***0.0024***	***0.0025***	***0.0027***	***0.0028***	***0.0030***	***0.0030***	***0.0029***	***0.0024***	***0.0020***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.49E-04	4.89E-04	3.49E-04	2.71E-04	2.38E-04	4.28E-04	9.42E-04	1.80E-03	2.35E-03	2.28E-03	2.12E-03	2.05E-03	1.72E-03	1.60E-03	1.70E-03	1.78E-03	1.86E-03	1.98E-03	2.03E-03	1.93E-03	1.59E-03	1.33E-03	1.24E-03	1.08E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.25E-04	2.44E-04	1.74E-04	1.36E-04	1.19E-04	2.14E-04	4.71E-04	9.00E-04	1.17E-03	1.14E-03	1.06E-03	1.02E-03	8.58E-04	7.98E-04	8.48E-04	8.92E-04	9.29E-04	9.89E-04	1.01E-03	9.66E-04	7.96E-04	6.66E-04	6.19E-04	5.38E-04
	Emission in each Box of 1st jet	g/s	3.25E-04	2.44E-04	1.74E-04	1.36E-04	1.19E-04	2.14E-04	4.71E-04	9.00E-04	1.17E-03	1.14E-03	1.06E-03	1.02E-03	8.58E-04	7.98E-04	8.48E-04	8.92E-04	9.29E-04	9.89E-04	1.01E-03	9.66E-04	7.96E-04	6.66E-04	6.19E-04	5.38E-04
	Emission in each Box of 2nd jet	g/s	3.25E-04	2.44E-04	1.74E-04	1.36E-04	1.19E-04	2.14E-04	4.71E-04	9.00E-04	1.17E-03	1.14E-03	1.06E-03	1.02E-03	8.58E-04	7.98E-04	8.48E-04	8.92E-04	9.29E-04	9.89E-04	1.01E-03	9.66E-04	7.96E-04	6.66E-04	6.19E-04	5.38E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1839	0.1376	0.1421	0.1543	0.1660	0.3826	0.4063	0.2770	0.2065	0.2039	0.2036	0.2081	0.1513	0.1536	0.1509	0.1522	0.1520	0.1514	0.1495	0.1470	0.1523	0.1590	0.1613	0.1566
	NO2	g/vehicle/km	0.0277	0.0257	0.0264	0.0275	0.0282	0.0393	0.0402	0.0329	0.0292	0.0290	0.0288	0.0291	0.0262	0.0263	0.0262	0.0262	0.0262	0.0261	0.0259	0.0259	0.0263	0.0267	0.0269	0.0266
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0065***	***0.0039***	***0.0028***	***0.0023***	***0.0021***	***0.0061***	***0.0139***	***0.0224***	***0.0245***	***0.0234***	***0.0214***	***0.0210***	***0.0142***	***0.0135***	***0.0141***	***0.0149***	***0.0156***	***0.0167***	***0.0175***	***0.0165***	***0.0140***	***0.0120***	***0.0113***	***0.0097***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.35E-03	2.63E-03	1.88E-03	1.52E-03	1.37E-03	4.07E-03	9.25E-03	1.49E-02	1.63E-02	1.56E-02	1.43E-02	1.40E-02	9.47E-03	9.00E-03	9.38E-03	9.94E-03	1.04E-02	1.12E-02	1.16E-02	1.10E-02	9.34E-03	7.97E-03	7.57E-03	6.49E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.18E-03	1.31E-03	9.42E-04	7.62E-04	6.87E-04	2.04E-03	4.62E-03	7.46E-03	8.15E-03	7.80E-03	7.15E-03	7.00E-03	4.74E-03	4.50E-03	4.69E-03	4.97E-03	5.19E-03	5.58E-03	5.82E-03	5.50E-03	4.67E-03	3.99E-03	3.78E-03	3.24E-03
	Emission in each Box of 1st jet	g/s	2.18E-03	1.31E-03	9.42E-04	7.62E-04	6.87E-04	2.04E-03	4.62E-03	7.46E-03	8.15E-03	7.80E-03	7.15E-03	7.00E-03	4.74E-03	4.50E-03	4.69E-03	4.97E-03	5.19E-03	5.58E-03	5.82E-03	5.50E-03	4.67E-03	3.99E-03	3.78E-03	3.24E-03
	Emission in each Box of 2nd jet	g/s	2.18E-03	1.31E-03	9.42E-04	7.62E-04	6.87E-04	2.04E-03	4.62E-03	7.46E-03	8.15E-03	7.80E-03	7.15E-03	7.00E-03	4.74E-03	4.50E-03	4.69E-03	4.97E-03	5.19E-03	5.58E-03	5.82E-03	5.50E-03	4.67E-03	3.99E-03	3.78E-03	3.24E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0027***	***0.0035***	***0.0033***	***0.0030***	***0.0029***	***0.0025***	***0.0023***	***0.0024***	***0.0026***	***0.0027***	***0.0029***	***0.0030***	***0.0029***	***0.0024***	***0.0020***	***0.0019***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.56E-04	4.90E-04	3.50E-04	2.72E-04	2.34E-04	4.18E-04	9.14E-04	1.77E-03	2.30E-03	2.22E-03	2.02E-03	1.96E-03	1.64E-03	1.54E-03	1.63E-03	1.71E-03	1.79E-03	1.92E-03	2.02E-03	1.93E-03	1.61E-03	1.34E-03	1.26E-03	1.10E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.28E-04	2.45E-04	1.75E-04	1.36E-04	1.17E-04	2.09E-04	4.57E-04	8.86E-04	1.15E-03	1.11E-03	1.01E-03	9.79E-04	8.19E-04	7.71E-04	8.13E-04	8.56E-04	8.94E-04	9.61E-04	1.01E-03	9.67E-04	8.07E-04	6.69E-04	6.30E-04	5.50E-04
	Emission in each Box of 1st jet	g/s	3.28E-04	2.45E-04	1.75E-04	1.36E-04	1.17E-04	2.09E-04	4.57E-04	8.86E-04	1.15E-03	1.11E-03	1.01E-03	9.79E-04	8.19E-04	7.71E-04	8.13E-04	8.56E-04	8.94E-04	9.61E-04	1.01E-03	9.67E-04	8.07E-04	6.69E-04	6.30E-04	5.50E-04
	Emission in each Box of 2nd jet	g/s	3.28E-04	2.45E-04	1.75E-04	1.36E-04	1.17E-04	2.09E-04	4.57E-04	8.86E-04	1.15E-03	1.11E-03	1.01E-03	9.79E-04	8.19E-04	7.71E-04	8.13E-04	8.56E-04	8.94E-04	9.61E-04	1.01E-03	9.67E-04	8.07E-04	6.69E-04	6.30E-04	5.50E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1692	0.1279	0.1333	0.1447	0.1560	0.3640	0.3928	0.2768	0.2052	0.2036	0.2063	0.2086	0.1492	0.1519	0.1476	0.1489	0.1493	0.1465	0.1426	0.1383	0.1421	0.1481	0.1471	0.1398
	NO2	g/vehicle/km	0.0257	0.0241	0.0251	0.0262	0.0268	0.0376	0.0390	0.0330	0.0291	0.0290	0.0293	0.0292	0.0259	0.0261	0.0257	0.0258	0.0258	0.0254	0.0249	0.0246	0.0248	0.0250	0.0247	0.0240
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0060***	***0.0037***	***0.0027***	***0.0021***	***0.0019***	***0.0058***	***0.0134***	***0.0224***	***0.0243***	***0.0234***	***0.0217***	***0.0211***	***0.0140***	***0.0133***	***0.0138***	***0.0146***	***0.0153***	***0.0162***	***0.0167***	***0.0155***	***0.0131***	***0.0111***	***0.0103***	***0.0087***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.00E-03	2.44E-03	1.77E-03	1.43E-03	1.29E-03	3.87E-03	8.94E-03	1.49E-02	1.62E-02	1.56E-02	1.45E-02	1.40E-02	9.34E-03	8.90E-03	9.18E-03	9.72E-03	1.02E-02	1.08E-02	1.11E-02	1.03E-02	8.71E-03	7.43E-03	6.90E-03	5.79E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.00E-03	1.22E-03	8.84E-04	7.14E-04	6.45E-04	1.94E-03	4.47E-03	7.46E-03	8.10E-03	7.79E-03	7.24E-03	7.02E-03	4.67E-03	4.45E-03	4.59E-03	4.86E-03	5.10E-03	5.40E-03	5.55E-03	5.17E-03	4.35E-03	3.71E-03	3.45E-03	2.89E-03
	Emission in each Box of 1st jet	g/s	2.00E-03	1.22E-03	8.84E-04	7.14E-04	6.45E-04	1.94E-03	4.47E-03	7.46E-03	8.10E-03	7.79E-03	7.24E-03	7.02E-03	4.67E-03	4.45E-03	4.59E-03	4.86E-03	5.10E-03	5.40E-03	5.55E-03	5.17E-03	4.35E-03	3.71E-03	3.45E-03	2.89E-03
	Emission in each Box of 2nd jet	g/s	2.00E-03	1.22E-03	8.84E-04	7.14E-04	6.45E-04	1.94E-03	4.47E-03	7.46E-03	8.10E-03	7.79E-03	7.24E-03	7.02E-03	4.67E-03	4.45E-03	4.59E-03	4.86E-03	5.10E-03	5.40E-03	5.55E-03	5.17E-03	4.35E-03	3.71E-03	3.45E-03	2.89E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0027***	***0.0034***	***0.0033***	***0.0031***	***0.0030***	***0.0024***	***0.0023***	***0.0024***	***0.0025***	***0.0026***	***0.0028***	***0.0029***	***0.0028***	***0.0023***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.08E-04	4.60E-04	3.32E-04	2.58E-04	2.22E-04	4.00E-04	8.87E-04	1.78E-03	2.30E-03	2.22E-03	2.05E-03	1.97E-03	1.62E-03	1.53E-03	1.60E-03	1.68E-03	1.77E-03	1.87E-03	1.94E-03	1.84E-03	1.52E-03	1.26E-03	1.16E-03	9.95E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.04E-04	2.30E-04	1.66E-04	1.29E-04	1.11E-04	2.00E-04	4.44E-04	8.88E-04	1.15E-03	1.11E-03	1.03E-03	9.84E-04	8.10E-04	7.65E-04	7.99E-04	8.41E-04	8.83E-04	9.37E-04	9.71E-04	9.18E-04	7.59E-04	6.28E-04	5.81E-04	4.97E-04
	Emission in each Box of 1st jet	g/s	3.04E-04	2.30E-04	1.66E-04	1.29E-04	1.11E-04	2.00E-04	4.44E-04	8.88E-04	1.15E-03	1.11E-03	1.03E-03	9.84E-04	8.10E-04	7.65E-04	7.99E-04	8.41E-04	8.83E-04	9.37E-04	9.71E-04	9.18E-04	7.59E-04	6.28E-04	5.81E-04	4.97E-04
	Emission in each Box of 2nd jet	g/s	3.04E-04	2.30E-04	1.66E-04	1.29E-04	1.11E-04	2.00E-04	4.44E-04	8.88E-04	1.15E-03	1.11E-03	1.03E-03	9.84E-04	8.10E-04	7.65E-04	7.99E-04	8.41E-04	8.83E-04	9.37E-04	9.71E-04	9.18E-04	7.59E-04	6.28E-04	5.81E-04	4.97E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1629	0.1190	0.1221	0.1309	0.1407	0.3281	0.3489	0.2382	0.1810	0.1794	0.1840	0.1886	0.1369	0.1361	0.1358	0.1354	0.1336	0.1306	0.1276	0.1255	0.1301	0.1388	0.1391	0.1336
	NO2	g/vehicle/km	0.0248	0.0227	0.0232	0.0240	0.0245	0.0341	0.0349	0.0286	0.0259	0.0259	0.0263	0.0266	0.0239	0.0236	0.0238	0.0236	0.0233	0.0229	0.0225	0.0225	0.0229	0.0236	0.0235	0.0231
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0058***	***0.0034***	***0.0024***	***0.0019***	***0.0017***	***0.0052***	***0.0119***	***0.0192***	***0.0214***	***0.0206***	***0.0194***	***0.0190***	***0.0129***	***0.0120***	***0.0127***	***0.0133***	***0.0137***	***0.0144***	***0.0149***	***0.0141***	***0.0120***	***0.0104***	***0.0098***	***0.0083***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.85E-03	2.27E-03	1.62E-03	1.29E-03	1.16E-03	3.49E-03	7.94E-03	1.28E-02	1.43E-02	1.37E-02	1.29E-02	1.27E-02	8.57E-03	7.97E-03	8.44E-03	8.84E-03	9.13E-03	9.62E-03	9.94E-03	9.38E-03	7.98E-03	6.96E-03	6.52E-03	5.53E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.93E-03	1.14E-03	8.09E-04	6.46E-04	5.82E-04	1.75E-03	3.97E-03	6.42E-03	7.15E-03	6.87E-03	6.46E-03	6.34E-03	4.28E-03	3.98E-03	4.22E-03	4.42E-03	4.57E-03	4.81E-03	4.97E-03	4.69E-03	3.99E-03	3.48E-03	3.26E-03	2.77E-03
	Emission in each Box of 1st jet	g/s	1.93E-03	1.14E-03	8.09E-04	6.46E-04	5.82E-04	1.75E-03	3.97E-03	6.42E-03	7.15E-03	6.87E-03	6.46E-03	6.34E-03	4.28E-03	3.98E-03	4.22E-03	4.42E-03	4.57E-03	4.81E-03	4.97E-03	4.69E-03	3.99E-03	3.48E-03	3.26E-03	2.77E-03
	Emission in each Box of 2nd jet	g/s	1.93E-03	1.14E-03	8.09E-04	6.46E-04	5.82E-04	1.75E-03	3.97E-03	6.42E-03	7.15E-03	6.87E-03	6.46E-03	6.34E-03	4.28E-03	3.98E-03	4.22E-03	4.42E-03	4.57E-03	4.81E-03	4.97E-03	4.69E-03	3.99E-03	3.48E-03	3.26E-03	2.77E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0012***	***0.0023***	***0.0031***	***0.0030***	***0.0028***	***0.0027***	***0.0022***	***0.0021***	***0.0022***	***0.0023***	***0.0024***	***0.0025***	***0.0026***	***0.0025***	***0.0021***	***0.0018***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.87E-04	4.33E-04	3.08E-04	2.37E-04	2.03E-04	3.63E-04	7.94E-04	1.54E-03	2.05E-03	1.98E-03	1.85E-03	1.79E-03	1.50E-03	1.38E-03	1.48E-03	1.54E-03	1.59E-03	1.68E-03	1.75E-03	1.68E-03	1.40E-03	1.19E-03	1.10E-03	9.55E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.94E-04	2.16E-04	1.54E-04	1.18E-04	1.01E-04	1.81E-04	3.97E-04	7.71E-04	1.02E-03	9.90E-04	9.24E-04	8.95E-04	7.48E-04	6.91E-04	7.39E-04	7.70E-04	7.97E-04	8.42E-04	8.76E-04	8.42E-04	7.02E-04	5.93E-04	5.52E-04	4.77E-04
	Emission in each Box of 1st jet	g/s	2.94E-04	2.16E-04	1.54E-04	1.18E-04	1.01E-04	1.81E-04	3.97E-04	7.71E-04	1.02E-03	9.90E-04	9.24E-04	8.95E-04	7.48E-04	6.91E-04	7.39E-04	7.70E-04	7.97E-04	8.42E-04	8.76E-04	8.42E-04	7.02E-04	5.93E-04	5.52E-04	4.77E-04
	Emission in each Box of 2nd jet	g/s	2.94E-04	2.16E-04	1.54E-04	1.18E-04	1.01E-04	1.81E-04	3.97E-04	7.71E-04	1.02E-03	9.90E-04	9.24E-04	8.95E-04	7.48E-04	6.91E-04	7.39E-04	7.70E-04	7.97E-04	8.42E-04	8.76E-04	8.42E-04	7.02E-04	5.93E-04	5.52E-04	4.77E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1484	0.1126	0.1188	0.1262	0.1352	0.3134	0.3332	0.2345	0.1803	0.1767	0.1807	0.1819	0.1319	0.1364	0.1343	0.1351	0.1326	0.1324	0.1325	0.1275	0.1318	0.1392	0.1378	0.1353
	NO2	g/vehicle/km	0.0228	0.0216	0.0227	0.0232	0.0237	0.0326	0.0334	0.0282	0.0258	0.0255	0.0259	0.0257	0.0231	0.0237	0.0235	0.0235	0.0232	0.0231	0.0233	0.0228	0.0232	0.0237	0.0234	0.0233
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0053***	***0.0032***	***0.0024***	***0.0019***	***0.0017***	***0.0050***	***0.0114***	***0.0190***	***0.0214***	***0.0203***	***0.0190***	***0.0184***	***0.0124***	***0.0120***	***0.0125***	***0.0132***	***0.0136***	***0.0146***	***0.0155***	***0.0143***	***0.0121***	***0.0105***	***0.0097***	***0.0084***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.51E-03	2.15E-03	1.58E-03	1.25E-03	1.12E-03	3.34E-03	7.58E-03	1.26E-02	1.42E-02	1.35E-02	1.27E-02	1.22E-02	8.26E-03	7.99E-03	8.35E-03	8.82E-03	9.06E-03	9.75E-03	1.03E-02	9.53E-03	8.08E-03	6.98E-03	6.46E-03	5.60E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.76E-03	1.07E-03	7.88E-04	6.23E-04	5.59E-04	1.67E-03	3.79E-03	6.32E-03	7.12E-03	6.76E-03	6.35E-03	6.12E-03	4.13E-03	3.99E-03	4.18E-03	4.41E-03	4.53E-03	4.88E-03	5.16E-03	4.77E-03	4.04E-03	3.49E-03	3.23E-03	2.80E-03
	Emission in each Box of 1st jet	g/s	1.76E-03	1.07E-03	7.88E-04	6.23E-04	5.59E-04	1.67E-03	3.79E-03	6.32E-03	7.12E-03	6.76E-03	6.35E-03	6.12E-03	4.13E-03	3.99E-03	4.18E-03	4.41E-03	4.53E-03	4.88E-03	5.16E-03	4.77E-03	4.04E-03	3.49E-03	3.23E-03	2.80E-03
	Emission in each Box of 2nd jet	g/s	1.76E-03	1.07E-03	7.88E-04	6.23E-04	5.59E-04	1.67E-03	3.79E-03	6.32E-03	7.12E-03	6.76E-03	6.35E-03	6.12E-03	4.13E-03	3.99E-03	4.18E-03	4.41E-03	4.53E-03	4.88E-03	5.16E-03	4.77E-03	4.04E-03	3.49E-03	3.23E-03	2.80E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0005***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0023***	***0.0031***	***0.0029***	***0.0027***	***0.0026***	***0.0022***	***0.0021***	***0.0022***	***0.0023***	***0.0024***	***0.0026***	***0.0027***	***0.0026***	***0.0021***	***0.0018***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.38E-04	4.12E-04	3.01E-04	2.29E-04	1.96E-04	3.47E-04	7.59E-04	1.52E-03	2.04E-03	1.95E-03	1.82E-03	1.73E-03	1.45E-03	1.38E-03	1.46E-03	1.54E-03	1.58E-03	1.70E-03	1.81E-03	1.71E-03	1.42E-03	1.19E-03	1.10E-03	9.67E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.69E-04	2.06E-04	1.50E-04	1.15E-04	9.80E-05	1.74E-04	3.80E-04	7.61E-04	1.02E-03	9.76E-04	9.08E-04	8.66E-04	7.24E-04	6.92E-04	7.32E-04	7.69E-04	7.91E-04	8.52E-04	9.07E-04	8.54E-04	7.10E-04	5.94E-04	5.48E-04	4.83E-04
	Emission in each Box of 1st jet	g/s	2.69E-04	2.06E-04	1.50E-04	1.15E-04	9.80E-05	1.74E-04	3.80E-04	7.61E-04	1.02E-03	9.76E-04	9.08E-04	8.66E-04	7.24E-04	6.92E-04	7.32E-04	7.69E-04	7.91E-04	8.52E-04	9.07E-04	8.54E-04	7.10E-04	5.94E-04	5.48E-04	4.83E-04
	Emission in each Box of 2nd jet	g/s	2.69E-04	2.06E-04	1.50E-04	1.15E-04	9.80E-05	1.74E-04	3.80E-04	7.61E-04	1.02E-03	9.76E-04	9.08E-04	8.66E-04	7.24E-04	6.92E-04	7.32E-04	7.69E-04	7.91E-04	8.52E-04	9.07E-04	8.54E-04	7.10E-04	5.94E-04	5.48E-04	4.83E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1451	0.1086	0.1139	0.1207	0.1274	0.3053	0.3201	0.2239	0.1708	0.1768	0.1836	0.1908	0.1369	0.1386	0.1371	0.1390	0.1315	0.1306	0.1281	0.1223	0.1232	0.1302	0.1292	0.1231
	NO2	g/vehicle/km	0.0223	0.0208	0.0218	0.0223	0.0224	0.0319	0.0321	0.0270	0.0246	0.0255	0.0263	0.0269	0.0239	0.0240	0.0240	0.0242	0.0230	0.0229	0.0226	0.0220	0.0217	0.0222	0.0219	0.0214
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0051***	***0.0031***	***0.0023***	***0.0018***	***0.0016***	***0.0049***	***0.0109***	***0.0181***	***0.0202***	***0.0203***	***0.0193***	***0.0193***	***0.0129***	***0.0122***	***0.0128***	***0.0136***	***0.0135***	***0.0144***	***0.0150***	***0.0137***	***0.0113***	***0.0098***	***0.0091***	***0.0076***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.43E-03	2.07E-03	1.51E-03	1.19E-03	1.05E-03	3.25E-03	7.28E-03	1.21E-02	1.35E-02	1.35E-02	1.29E-02	1.28E-02	8.57E-03	8.12E-03	8.52E-03	9.08E-03	8.98E-03	9.62E-03	9.98E-03	9.15E-03	7.55E-03	6.53E-03	6.06E-03	5.10E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.72E-03	1.04E-03	7.55E-04	5.96E-04	5.27E-04	1.62E-03	3.64E-03	6.03E-03	6.74E-03	6.77E-03	6.45E-03	6.42E-03	4.28E-03	4.06E-03	4.26E-03	4.54E-03	4.49E-03	4.81E-03	4.99E-03	4.57E-03	3.78E-03	3.26E-03	3.03E-03	2.55E-03
	Emission in each Box of 1st jet	g/s	1.72E-03	1.04E-03	7.55E-04	5.96E-04	5.27E-04	1.62E-03	3.64E-03	6.03E-03	6.74E-03	6.77E-03	6.45E-03	6.42E-03	4.28E-03	4.06E-03	4.26E-03	4.54E-03	4.49E-03	4.81E-03	4.99E-03	4.57E-03	3.78E-03	3.26E-03	3.03E-03	2.55E-03
	Emission in each Box of 2nd jet	g/s	1.72E-03	1.04E-03	7.55E-04	5.96E-04	5.27E-04	1.62E-03	3.64E-03	6.03E-03	6.74E-03	6.77E-03	6.45E-03	6.42E-03	4.28E-03	4.06E-03	4.26E-03	4.54E-03	4.49E-03	4.81E-03	4.99E-03	4.57E-03	3.78E-03	3.26E-03	3.03E-03	2.55E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0022***	***0.0029***	***0.0029***	***0.0028***	***0.0027***	***0.0022***	***0.0021***	***0.0022***	***0.0024***	***0.0024***	***0.0025***	***0.0026***	***0.0025***	***0.0020***	***0.0017***	***0.0015***	***0.0013***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.27E-04	3.98E-04	2.88E-04	2.20E-04	1.86E-04	3.39E-04	7.31E-04	1.45E-03	1.94E-03	1.95E-03	1.84E-03	1.81E-03	1.50E-03	1.41E-03	1.49E-03	1.58E-03	1.57E-03	1.68E-03	1.76E-03	1.64E-03	1.33E-03	1.11E-03	1.03E-03	8.84E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.64E-04	1.99E-04	1.44E-04	1.10E-04	9.28E-05	1.70E-04	3.66E-04	7.26E-04	9.70E-04	9.76E-04	9.22E-04	9.05E-04	7.48E-04	7.03E-04	7.46E-04	7.89E-04	7.85E-04	8.42E-04	8.79E-04	8.22E-04	6.66E-04	5.57E-04	5.15E-04	4.42E-04
	Emission in each Box of 1st jet	g/s	2.64E-04	1.99E-04	1.44E-04	1.10E-04	9.28E-05	1.70E-04	3.66E-04	7.26E-04	9.70E-04	9.76E-04	9.22E-04	9.05E-04	7.48E-04	7.03E-04	7.46E-04	7.89E-04	7.85E-04	8.42E-04	8.79E-04	8.22E-04	6.66E-04	5.57E-04	5.15E-04	4.42E-04
	Emission in each Box of 2nd jet	g/s	2.64E-04	1.99E-04	1.44E-04	1.10E-04	9.28E-05	1.70E-04	3.66E-04	7.26E-04	9.70E-04	9.76E-04	9.22E-04	9.05E-04	7.48E-04	7.03E-04	7.46E-04	7.89E-04	7.85E-04	8.42E-04	8.79E-04	8.22E-04	6.66E-04	5.57E-04	5.15E-04	4.42E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1534	0.1117	0.1178	0.1273	0.1352	0.3121	0.3318	0.2229	0.1724	0.1733	0.1795	0.1826	0.1330	0.1384	0.1373	0.1371	0.1405	0.1369	0.1355	0.1296	0.1292	0.1321	0.1340	0.1296
	NO2	g/vehicle/km	0.0235	0.0214	0.0225	0.0234	0.0237	0.0325	0.0332	0.0269	0.0248	0.0250	0.0257	0.0258	0.0233	0.0240	0.0240	0.0239	0.0244	0.0239	0.0238	0.0232	0.0227	0.0226	0.0228	0.0224
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0054***	***0.0032***	***0.0023***	***0.0019***	***0.0017***	***0.0050***	***0.0113***	***0.0180***	***0.0204***	***0.0199***	***0.0189***	***0.0184***	***0.0125***	***0.0122***	***0.0128***	***0.0134***	***0.0144***	***0.0151***	***0.0158***	***0.0145***	***0.0119***	***0.0099***	***0.0094***	***0.0080***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.63E-03	2.13E-03	1.56E-03	1.26E-03	1.12E-03	3.32E-03	7.55E-03	1.20E-02	1.36E-02	1.33E-02	1.26E-02	1.23E-02	8.33E-03	8.11E-03	8.53E-03	8.95E-03	9.60E-03	1.01E-02	1.06E-02	9.69E-03	7.92E-03	6.63E-03	6.29E-03	5.37E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.81E-03	1.07E-03	7.81E-04	6.29E-04	5.59E-04	1.66E-03	3.78E-03	6.00E-03	6.81E-03	6.63E-03	6.30E-03	6.14E-03	4.16E-03	4.05E-03	4.27E-03	4.48E-03	4.80E-03	5.04E-03	5.28E-03	4.85E-03	3.96E-03	3.31E-03	3.14E-03	2.68E-03
	Emission in each Box of 1st jet	g/s	1.81E-03	1.07E-03	7.81E-04	6.29E-04	5.59E-04	1.66E-03	3.78E-03	6.00E-03	6.81E-03	6.63E-03	6.30E-03	6.14E-03	4.16E-03	4.05E-03	4.27E-03	4.48E-03	4.80E-03	5.04E-03	5.28E-03	4.85E-03	3.96E-03	3.31E-03	3.14E-03	2.68E-03
	Emission in each Box of 2nd jet	g/s	1.81E-03	1.07E-03	7.81E-04	6.29E-04	5.59E-04	1.66E-03	3.78E-03	6.00E-03	6.81E-03	6.63E-03	6.30E-03	6.14E-03	4.16E-03	4.05E-03	4.27E-03	4.48E-03	4.80E-03	5.04E-03	5.28E-03	4.85E-03	3.96E-03	3.31E-03	3.14E-03	2.68E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0022***	***0.0029***	***0.0029***	***0.0027***	***0.0026***	***0.0022***	***0.0021***	***0.0022***	***0.0023***	***0.0025***	***0.0026***	***0.0028***	***0.0026***	***0.0021***	***0.0017***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.57E-04	4.08E-04	2.98E-04	2.31E-04	1.96E-04	3.46E-04	7.56E-04	1.45E-03	1.96E-03	1.92E-03	1.81E-03	1.74E-03	1.46E-03	1.40E-03	1.49E-03	1.56E-03	1.67E-03	1.76E-03	1.85E-03	1.73E-03	1.39E-03	1.13E-03	1.07E-03	9.29E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.78E-04	2.04E-04	1.49E-04	1.16E-04	9.80E-05	1.73E-04	3.78E-04	7.23E-04	9.79E-04	9.58E-04	9.03E-04	8.69E-04	7.29E-04	7.02E-04	7.47E-04	7.79E-04	8.35E-04	8.79E-04	9.26E-04	8.67E-04	6.97E-04	5.67E-04	5.34E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	2.78E-04	2.04E-04	1.49E-04	1.16E-04	9.80E-05	1.73E-04	3.78E-04	7.23E-04	9.79E-04	9.58E-04	9.03E-04	8.69E-04	7.29E-04	7.02E-04	7.47E-04	7.79E-04	8.35E-04	8.79E-04	9.26E-04	8.67E-04	6.97E-04	5.67E-04	5.34E-04	4.65E-04
	Emission in each Box of 2nd jet	g/s	2.78E-04	2.04E-04	1.49E-04	1.16E-04	9.80E-05	1.73E-04	3.78E-04	7.23E-04	9.79E-04	9.58E-04	9.03E-04	8.69E-04	7.29E-04	7.02E-04	7.47E-04	7.79E-04	8.35E-04	8.79E-04	9.26E-04	8.67E-04	6.97E-04	5.67E-04	5.34E-04	4.65E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1523	0.1142	0.1162	0.1220	0.1345	0.3039	0.3246	0.2191	0.1651	0.1655	0.1780	0.1743	0.1308	0.1345	0.1363	0.1299	0.1262	0.1294	0.1292	0.1236	0.1291	0.1334	0.1336	0.1281
	NO2	g/vehicle/km	0.0234	0.0218	0.0222	0.0225	0.0236	0.0317	0.0326	0.0264	0.0237	0.0240	0.0255	0.0247	0.0229	0.0233	0.0238	0.0227	0.0221	0.0227	0.0228	0.0222	0.0227	0.0228	0.0227	0.0222
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0054***	***0.0033***	***0.0023***	***0.0018***	***0.0017***	***0.0049***	***0.0111***	***0.0177***	***0.0196***	***0.0190***	***0.0187***	***0.0176***	***0.0123***	***0.0118***	***0.0127***	***0.0127***	***0.0129***	***0.0143***	***0.0151***	***0.0139***	***0.0119***	***0.0100***	***0.0094***	***0.0080***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.60E-03	2.18E-03	1.54E-03	1.20E-03	1.11E-03	3.23E-03	7.39E-03	1.18E-02	1.30E-02	1.27E-02	1.25E-02	1.17E-02	8.19E-03	7.88E-03	8.48E-03	8.48E-03	8.62E-03	9.53E-03	1.01E-02	9.25E-03	7.91E-03	6.69E-03	6.27E-03	5.30E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.80E-03	1.09E-03	7.70E-04	6.02E-04	5.56E-04	1.62E-03	3.69E-03	5.90E-03	6.52E-03	6.33E-03	6.25E-03	5.86E-03	4.09E-03	3.94E-03	4.24E-03	4.24E-03	4.31E-03	4.77E-03	5.03E-03	4.62E-03	3.96E-03	3.34E-03	3.13E-03	2.65E-03
	Emission in each Box of 1st jet	g/s	1.80E-03	1.09E-03	7.70E-04	6.02E-04	5.56E-04	1.62E-03	3.69E-03	5.90E-03	6.52E-03	6.33E-03	6.25E-03	5.86E-03	4.09E-03	3.94E-03	4.24E-03	4.24E-03	4.31E-03	4.77E-03	5.03E-03	4.62E-03	3.96E-03	3.34E-03	3.13E-03	2.65E-03
	Emission in each Box of 2nd jet	g/s	1.80E-03	1.09E-03	7.70E-04	6.02E-04	5.56E-04	1.62E-03	3.69E-03	5.90E-03	6.52E-03	6.33E-03	6.25E-03	5.86E-03	4.09E-03	3.94E-03	4.24E-03	4.24E-03	4.31E-03	4.77E-03	5.03E-03	4.62E-03	3.96E-03	3.34E-03	3.13E-03	2.65E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0021***	***0.0028***	***0.0028***	***0.0027***	***0.0025***	***0.0022***	***0.0020***	***0.0022***	***0.0022***	***0.0023***	***0.0025***	***0.0027***	***0.0025***	***0.0021***	***0.0017***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.53E-04	4.17E-04	2.94E-04	2.22E-04	1.95E-04	3.38E-04	7.41E-04	1.42E-03	1.87E-03	1.84E-03	1.79E-03	1.66E-03	1.44E-03	1.37E-03	1.48E-03	1.48E-03	1.51E-03	1.67E-03	1.77E-03	1.66E-03	1.39E-03	1.14E-03	1.07E-03	9.20E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.76E-04	2.09E-04	1.47E-04	1.11E-04	9.75E-05	1.69E-04	3.70E-04	7.12E-04	9.37E-04	9.18E-04	8.95E-04	8.32E-04	7.18E-04	6.83E-04	7.41E-04	7.41E-04	7.56E-04	8.35E-04	8.86E-04	8.30E-04	6.96E-04	5.71E-04	5.33E-04	4.60E-04
	Emission in each Box of 1st jet	g/s	2.76E-04	2.09E-04	1.47E-04	1.11E-04	9.75E-05	1.69E-04	3.70E-04	7.12E-04	9.37E-04	9.18E-04	8.95E-04	8.32E-04	7.18E-04	6.83E-04	7.41E-04	7.41E-04	7.56E-04	8.35E-04	8.86E-04	8.30E-04	6.96E-04	5.71E-04	5.33E-04	4.60E-04
	Emission in each Box of 2nd jet	g/s	2.76E-04	2.09E-04	1.47E-04	1.11E-04	9.75E-05	1.69E-04	3.70E-04	7.12E-04	9.37E-04	9.18E-04	8.95E-04	8.32E-04	7.18E-04	6.83E-04	7.41E-04	7.41E-04	7.56E-04	8.35E-04	8.86E-04	8.30E-04	6.96E-04	5.71E-04	5.33E-04	4.60E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1735	0.1323	0.1355	0.1447	0.1561	0.3661	0.3871	0.2618	0.1971	0.1953	0.1993	0.2045	0.1498	0.1506	0.1472	0.1500	0.1461	0.1458	0.1456	0.1403	0.1456	0.1505	0.1521	0.1485
	NO2	g/vehicle/km	0.0263	0.0248	0.0254	0.0261	0.0268	0.0377	0.0384	0.0312	0.0280	0.0279	0.0283	0.0287	0.0260	0.0259	0.0256	0.0259	0.0253	0.0253	0.0253	0.0249	0.0253	0.0254	0.0255	0.0254
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0062***	***0.0038***	***0.0027***	***0.0021***	***0.0019***	***0.0058***	***0.0132***	***0.0212***	***0.0233***	***0.0224***	***0.0210***	***0.0206***	***0.0141***	***0.0132***	***0.0137***	***0.0147***	***0.0150***	***0.0161***	***0.0170***	***0.0157***	***0.0134***	***0.0113***	***0.0107***	***0.0092***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.11E-03	2.53E-03	1.80E-03	1.43E-03	1.29E-03	3.90E-03	8.81E-03	1.41E-02	1.56E-02	1.49E-02	1.40E-02	1.38E-02	9.38E-03	8.82E-03	9.15E-03	9.80E-03	9.98E-03	1.07E-02	1.13E-02	1.05E-02	8.93E-03	7.54E-03	7.14E-03	6.15E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.05E-03	1.26E-03	8.98E-04	7.14E-04	6.46E-04	1.95E-03	4.40E-03	7.05E-03	7.78E-03	7.47E-03	7.00E-03	6.88E-03	4.69E-03	4.41E-03	4.58E-03	4.90E-03	4.99E-03	5.37E-03	5.67E-03	5.25E-03	4.46E-03	3.77E-03	3.57E-03	3.08E-03
	Emission in each Box of 1st jet	g/s	2.05E-03	1.26E-03	8.98E-04	7.14E-04	6.46E-04	1.95E-03	4.40E-03	7.05E-03	7.78E-03	7.47E-03	7.00E-03	6.88E-03	4.69E-03	4.41E-03	4.58E-03	4.90E-03	4.99E-03	5.37E-03	5.67E-03	5.25E-03	4.46E-03	3.77E-03	3.57E-03	3.08E-03
	Emission in each Box of 2nd jet	g/s	2.05E-03	1.26E-03	8.98E-04	7.14E-04	6.46E-04	1.95E-03	4.40E-03	7.05E-03	7.78E-03	7.47E-03	7.00E-03	6.88E-03	4.69E-03	4.41E-03	4.58E-03	4.90E-03	4.99E-03	5.37E-03	5.67E-03	5.25E-03	4.46E-03	3.77E-03	3.57E-03	3.08E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0025***	***0.0033***	***0.0032***	***0.0030***	***0.0029***	***0.0024***	***0.0023***	***0.0024***	***0.0025***	***0.0026***	***0.0028***	***0.0030***	***0.0028***	***0.0023***	***0.0019***	***0.0018***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.23E-04	4.74E-04	3.37E-04	2.58E-04	2.22E-04	4.01E-04	8.75E-04	1.68E-03	2.21E-03	2.14E-03	1.99E-03	1.93E-03	1.63E-03	1.52E-03	1.59E-03	1.69E-03	1.73E-03	1.86E-03	1.97E-03	1.86E-03	1.55E-03	1.28E-03	1.20E-03	1.05E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.11E-04	2.37E-04	1.68E-04	1.29E-04	1.11E-04	2.01E-04	4.37E-04	8.42E-04	1.11E-03	1.07E-03	9.94E-04	9.65E-04	8.13E-04	7.58E-04	7.96E-04	8.46E-04	8.65E-04	9.31E-04	9.87E-04	9.32E-04	7.76E-04	6.38E-04	5.99E-04	5.26E-04
	Emission in each Box of 1st jet	g/s	3.11E-04	2.37E-04	1.68E-04	1.29E-04	1.11E-04	2.01E-04	4.37E-04	8.42E-04	1.11E-03	1.07E-03	9.94E-04	9.65E-04	8.13E-04	7.58E-04	7.96E-04	8.46E-04	8.65E-04	9.31E-04	9.87E-04	9.32E-04	7.76E-04	6.38E-04	5.99E-04	5.26E-04
	Emission in each Box of 2nd jet	g/s	3.11E-04	2.37E-04	1.68E-04	1.29E-04	1.11E-04	2.01E-04	4.37E-04	8.42E-04	1.11E-03	1.07E-03	9.94E-04	9.65E-04	8.13E-04	7.58E-04	7.96E-04	8.46E-04	8.65E-04	9.31E-04	9.87E-04	9.32E-04	7.76E-04	6.38E-04	5.99E-04	5.26E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1899	0.1422	0.1479	0.1588	0.1709	0.3960	0.4228	0.2831	0.2134	0.2107	0.2157	0.2182	0.1611	0.1635	0.1605	0.1607	0.1571	0.1559	0.1555	0.1527	0.1564	0.1646	0.1655	0.1607
	NO2	g/vehicle/km	0.0286	0.0265	0.0274	0.0283	0.0290	0.0406	0.0418	0.0337	0.0301	0.0299	0.0304	0.0304	0.0277	0.0278	0.0277	0.0275	0.0270	0.0268	0.0269	0.0268	0.0270	0.0276	0.0276	0.0272
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0067***	***0.0041***	***0.0029***	***0.0024***	***0.0021***	***0.0063***	***0.0144***	***0.0229***	***0.0253***	***0.0242***	***0.0227***	***0.0220***	***0.0151***	***0.0144***	***0.0150***	***0.0157***	***0.0161***	***0.0172***	***0.0182***	***0.0171***	***0.0144***	***0.0124***	***0.0116***	***0.0100***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.49E-03	2.71E-03	1.96E-03	1.57E-03	1.41E-03	4.22E-03	9.62E-03	1.53E-02	1.69E-02	1.61E-02	1.51E-02	1.47E-02	1.01E-02	9.57E-03	9.98E-03	1.05E-02	1.07E-02	1.15E-02	1.21E-02	1.14E-02	9.58E-03	8.26E-03	7.77E-03	6.66E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.25E-03	1.36E-03	9.80E-04	7.84E-04	7.07E-04	2.11E-03	4.81E-03	7.63E-03	8.43E-03	8.07E-03	7.57E-03	7.34E-03	5.04E-03	4.79E-03	4.99E-03	5.25E-03	5.37E-03	5.74E-03	6.06E-03	5.71E-03	4.79E-03	4.13E-03	3.88E-03	3.33E-03
	Emission in each Box of 1st jet	g/s	2.25E-03	1.36E-03	9.80E-04	7.84E-04	7.07E-04	2.11E-03	4.81E-03	7.63E-03	8.43E-03	8.07E-03	7.57E-03	7.34E-03	5.04E-03	4.79E-03	4.99E-03	5.25E-03	5.37E-03	5.74E-03	6.06E-03	5.71E-03	4.79E-03	4.13E-03	3.88E-03	3.33E-03
	Emission in each Box of 2nd jet	g/s	2.25E-03	1.36E-03	9.80E-04	7.84E-04	7.07E-04	2.11E-03	4.81E-03	7.63E-03	8.43E-03	8.07E-03	7.57E-03	7.34E-03	5.04E-03	4.79E-03	4.99E-03	5.25E-03	5.37E-03	5.74E-03	6.06E-03	5.71E-03	4.79E-03	4.13E-03	3.88E-03	3.33E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0027***	***0.0036***	***0.0034***	***0.0032***	***0.0031***	***0.0026***	***0.0024***	***0.0026***	***0.0027***	***0.0028***	***0.0030***	***0.0031***	***0.0030***	***0.0025***	***0.0021***	***0.0019***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.76E-04	5.06E-04	3.63E-04	2.79E-04	2.40E-04	4.33E-04	9.51E-04	1.81E-03	2.38E-03	2.29E-03	2.14E-03	2.04E-03	1.73E-03	1.63E-03	1.72E-03	1.80E-03	1.85E-03	1.97E-03	2.10E-03	2.01E-03	1.66E-03	1.38E-03	1.29E-03	1.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.38E-04	2.53E-04	1.82E-04	1.40E-04	1.20E-04	2.16E-04	4.75E-04	9.07E-04	1.19E-03	1.15E-03	1.07E-03	1.02E-03	8.66E-04	8.14E-04	8.60E-04	8.99E-04	9.23E-04	9.86E-04	1.05E-03	1.00E-03	8.28E-04	6.91E-04	6.46E-04	5.64E-04
	Emission in each Box of 1st jet	g/s	3.38E-04	2.53E-04	1.82E-04	1.40E-04	1.20E-04	2.16E-04	4.75E-04	9.07E-04	1.19E-03	1.15E-03	1.07E-03	1.02E-03	8.66E-04	8.14E-04	8.60E-04	8.99E-04	9.23E-04	9.86E-04	1.05E-03	1.00E-03	8.28E-04	6.91E-04	6.46E-04	5.64E-04
	Emission in each Box of 2nd jet	g/s	3.38E-04	2.53E-04	1.82E-04	1.40E-04	1.20E-04	2.16E-04	4.75E-04	9.07E-04	1.19E-03	1.15E-03	1.07E-03	1.02E-03	8.66E-04	8.14E-04	8.60E-04	8.99E-04	9.23E-04	9.86E-04	1.05E-03	1.00E-03	8.28E-04	6.91E-04	6.46E-04	5.64E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1974	0.1490	0.1550	0.1667	0.1784	0.4080	0.4354	0.2933	0.2200	0.2171	0.2221	0.2262	0.1665	0.1680	0.1651	0.1658	0.1631	0.1636	0.1612	0.1582	0.1622	0.1707	0.1719	0.1675
	NO2	g/vehicle/km	0.0295	0.0274	0.0283	0.0293	0.0299	0.0417	0.0428	0.0346	0.0308	0.0306	0.0311	0.0313	0.0283	0.0284	0.0282	0.0282	0.0278	0.0278	0.0276	0.0275	0.0277	0.0283	0.0283	0.0281
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0070***	***0.0043***	***0.0031***	***0.0025***	***0.0022***	***0.0065***	***0.0149***	***0.0237***	***0.0261***	***0.0249***	***0.0234***	***0.0228***	***0.0156***	***0.0148***	***0.0154***	***0.0162***	***0.0167***	***0.0181***	***0.0188***	***0.0177***	***0.0149***	***0.0128***	***0.0121***	***0.0104***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.67E-03	2.85E-03	2.05E-03	1.65E-03	1.48E-03	4.34E-03	9.91E-03	1.58E-02	1.74E-02	1.66E-02	1.56E-02	1.52E-02	1.04E-02	9.84E-03	1.03E-02	1.08E-02	1.11E-02	1.20E-02	1.26E-02	1.18E-02	9.94E-03	8.56E-03	8.06E-03	6.94E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.33E-03	1.42E-03	1.03E-03	8.23E-04	7.38E-04	2.17E-03	4.95E-03	7.90E-03	8.69E-03	8.31E-03	7.80E-03	7.61E-03	5.21E-03	4.92E-03	5.13E-03	5.41E-03	5.57E-03	6.02E-03	6.28E-03	5.92E-03	4.97E-03	4.28E-03	4.03E-03	3.47E-03
	Emission in each Box of 1st jet	g/s	2.33E-03	1.42E-03	1.03E-03	8.23E-04	7.38E-04	2.17E-03	4.95E-03	7.90E-03	8.69E-03	8.31E-03	7.80E-03	7.61E-03	5.21E-03	4.92E-03	5.13E-03	5.41E-03	5.57E-03	6.02E-03	6.28E-03	5.92E-03	4.97E-03	4.28E-03	4.03E-03	3.47E-03
	Emission in each Box of 2nd jet	g/s	2.33E-03	1.42E-03	1.03E-03	8.23E-04	7.38E-04	2.17E-03	4.95E-03	7.90E-03	8.69E-03	8.31E-03	7.80E-03	7.61E-03	5.21E-03	4.92E-03	5.13E-03	5.41E-03	5.57E-03	6.02E-03	6.28E-03	5.92E-03	4.97E-03	4.28E-03	4.03E-03	3.47E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0007***	***0.0015***	***0.0028***	***0.0037***	***0.0035***	***0.0033***	***0.0032***	***0.0027***	***0.0025***	***0.0026***	***0.0028***	***0.0028***	***0.0031***	***0.0032***	***0.0031***	***0.0026***	***0.0021***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.97E-04	5.23E-04	3.75E-04	2.89E-04	2.48E-04	4.44E-04	9.74E-04	1.87E-03	2.44E-03	2.35E-03	2.19E-03	2.11E-03	1.77E-03	1.66E-03	1.75E-03	1.84E-03	1.90E-03	2.05E-03	2.15E-03	2.06E-03	1.70E-03	1.42E-03	1.33E-03	1.17E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.48E-04	2.61E-04	1.88E-04	1.45E-04	1.24E-04	2.22E-04	4.87E-04	9.33E-04	1.22E-03	1.17E-03	1.09E-03	1.05E-03	8.87E-04	8.32E-04	8.77E-04	9.20E-04	9.49E-04	1.02E-03	1.07E-03	1.03E-03	8.50E-04	7.09E-04	6.64E-04	5.83E-04
	Emission in each Box of 1st jet	g/s	3.48E-04	2.61E-04	1.88E-04	1.45E-04	1.24E-04	2.22E-04	4.87E-04	9.33E-04	1.22E-03	1.17E-03	1.09E-03	1.05E-03	8.87E-04	8.32E-04	8.77E-04	9.20E-04	9.49E-04	1.02E-03	1.07E-03	1.03E-03	8.50E-04	7.09E-04	6.64E-04	5.83E-04
	Emission in each Box of 2nd jet	g/s	3.48E-04	2.61E-04	1.88E-04	1.45E-04	1.24E-04	2.22E-04	4.87E-04	9.33E-04	1.22E-03	1.17E-03	1.09E-03	1.05E-03	8.87E-04	8.32E-04	8.77E-04	9.20E-04	9.49E-04	1.02E-03	1.07E-03	1.03E-03	8.50E-04	7.09E-04	6.64E-04	5.83E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1772	0.1344	0.1378	0.1533	0.1633	0.3774	0.4035	0.2685	0.2002	0.1971	0.1996	0.2046	0.1656	0.1687	0.1660	0.1656	0.1649	0.1656	0.1632	0.1588	0.1633	0.1744	0.1729	0.1667
	NO2	g/vehicle/km	0.0257	0.0240	0.0245	0.0258	0.0261	0.0378	0.0389	0.0308	0.0273	0.0271	0.0272	0.0276	0.0268	0.0270	0.0268	0.0267	0.0266	0.0266	0.0264	0.0262	0.0265	0.0271	0.0268	0.0264
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0128***	***0.0079***	***0.0056***	***0.0046***	***0.0041***	***0.0121***	***0.0277***	***0.0440***	***0.0483***	***0.0461***	***0.0428***	***0.0420***	***0.0298***	***0.0284***	***0.0296***	***0.0310***	***0.0323***	***0.0350***	***0.0365***	***0.0341***	***0.0287***	***0.0252***	***0.0233***	***0.0198***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.55E-03	5.24E-03	3.71E-03	3.09E-03	2.75E-03	8.06E-03	1.84E-02	2.93E-02	3.22E-02	3.07E-02	2.85E-02	2.80E-02	1.98E-02	1.89E-02	1.98E-02	2.07E-02	2.16E-02	2.33E-02	2.43E-02	2.27E-02	1.92E-02	1.68E-02	1.55E-02	1.32E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.27E-03	2.62E-03	1.86E-03	1.55E-03	1.38E-03	4.03E-03	9.22E-03	1.47E-02	1.61E-02	1.54E-02	1.43E-02	1.40E-02	9.92E-03	9.46E-03	9.88E-03	1.03E-02	1.08E-02	1.17E-02	1.22E-02	1.14E-02	9.58E-03	8.39E-03	7.76E-03	6.61E-03
	Emission in each Box of 1st jet	g/s	2.85E-03	1.75E-03	1.24E-03	1.03E-03	9.18E-04	2.69E-03	6.15E-03	9.77E-03	1.07E-02	1.02E-02	9.51E-03	9.34E-03	6.61E-03	6.31E-03	6.59E-03	6.90E-03	7.19E-03	7.78E-03	8.10E-03	7.57E-03	6.38E-03	5.59E-03	5.18E-03	4.40E-03
	Emission in each Box of 2nd jet	g/s	1.42E-03	8.73E-04	6.19E-04	5.16E-04	4.59E-04	1.34E-03	3.07E-03	4.88E-03	5.37E-03	5.12E-03	4.75E-03	4.67E-03	3.31E-03	3.15E-03	3.29E-03	3.45E-03	3.59E-03	3.89E-03	4.05E-03	3.78E-03	3.19E-03	2.80E-03	2.59E-03	2.20E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0012***	***0.0027***	***0.0050***	***0.0066***	***0.0063***	***0.0058***	***0.0057***	***0.0048***	***0.0045***	***0.0048***	***0.0050***	***0.0052***	***0.0056***	***0.0059***	***0.0056***	***0.0047***	***0.0039***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.24E-03	9.35E-04	6.59E-04	5.20E-04	4.39E-04	8.08E-04	1.78E-03	3.37E-03	4.39E-03	4.22E-03	3.89E-03	3.78E-03	3.21E-03	3.02E-03	3.19E-03	3.34E-03	3.48E-03	3.75E-03	3.94E-03	3.75E-03	3.11E-03	2.61E-03	2.41E-03	2.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.21E-04	4.67E-04	3.30E-04	2.60E-04	2.20E-04	4.04E-04	8.90E-04	1.68E-03	2.19E-03	2.11E-03	1.95E-03	1.89E-03	1.60E-03	1.51E-03	1.59E-03	1.67E-03	1.74E-03	1.87E-03	1.97E-03	1.88E-03	1.55E-03	1.31E-03	1.20E-03	1.05E-03
	Emission in each Box of 1st jet	g/s	4.14E-04	3.12E-04	2.20E-04	1.73E-04	1.46E-04	2.69E-04	5.93E-04	1.12E-03	1.46E-03	1.41E-03	1.30E-03	1.26E-03	1.07E-03	1.01E-03	1.06E-03	1.11E-03	1.16E-03	1.25E-03	1.31E-03	1.25E-03	1.04E-03	8.70E-04	8.03E-04	6.98E-04
	Emission in each Box of 2nd jet	g/s	2.07E-04	1.56E-04	1.10E-04	8.66E-05	7.32E-05	1.35E-04	2.97E-04	5.61E-04	7.31E-04	7.04E-04	6.49E-04	6.30E-04	5.35E-04	5.04E-04	5.31E-04	5.56E-04	5.81E-04	6.25E-04	6.56E-04	6.25E-04	5.18E-04	4.35E-04	4.02E-04	3.49E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1614	0.1213	0.1238	0.1387	0.1521	0.3579	0.3845	0.2533	0.1886	0.1883	0.1913	0.1952	0.1571	0.1580	0.1565	0.1567	0.1558	0.1546	0.1485	0.1443	0.1477	0.1584	0.1572	0.1514
	NO2	g/vehicle/km	0.0238	0.0222	0.0225	0.0238	0.0248	0.0362	0.0373	0.0294	0.0260	0.0261	0.0263	0.0266	0.0257	0.0256	0.0256	0.0256	0.0255	0.0252	0.0245	0.0243	0.0244	0.0251	0.0248	0.0244
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0117***	***0.0071***	***0.0050***	***0.0042***	***0.0038***	***0.0115***	***0.0264***	***0.0415***	***0.0455***	***0.0440***	***0.0410***	***0.0401***	***0.0282***	***0.0266***	***0.0279***	***0.0294***	***0.0306***	***0.0327***	***0.0332***	***0.0310***	***0.0260***	***0.0228***	***0.0212***	***0.0180***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.79E-03	4.73E-03	3.34E-03	2.80E-03	2.56E-03	7.65E-03	1.76E-02	2.76E-02	3.03E-02	2.94E-02	2.73E-02	2.67E-02	1.88E-02	1.77E-02	1.86E-02	1.96E-02	2.04E-02	2.18E-02	2.21E-02	2.06E-02	1.73E-02	1.52E-02	1.41E-02	1.20E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.89E-03	2.36E-03	1.67E-03	1.40E-03	1.28E-03	3.82E-03	8.79E-03	1.38E-02	1.52E-02	1.47E-02	1.37E-02	1.34E-02	9.41E-03	8.86E-03	9.31E-03	9.79E-03	1.02E-02	1.09E-02	1.11E-02	1.03E-02	8.67E-03	7.61E-03	7.06E-03	6.00E-03
	Emission in each Box of 1st jet	g/s	2.60E-03	1.58E-03	1.11E-03	9.33E-04	8.55E-04	2.55E-03	5.86E-03	9.21E-03	1.01E-02	9.79E-03	9.11E-03	8.91E-03	6.27E-03	5.91E-03	6.21E-03	6.52E-03	6.79E-03	7.26E-03	7.37E-03	6.88E-03	5.78E-03	5.08E-03	4.71E-03	4.00E-03
	Emission in each Box of 2nd jet	g/s	1.30E-03	7.88E-04	5.56E-04	4.67E-04	4.27E-04	1.27E-03	2.93E-03	4.61E-03	5.05E-03	4.89E-03	4.56E-03	4.45E-03	3.14E-03	2.95E-03	3.10E-03	3.26E-03	3.40E-03	3.63E-03	3.69E-03	3.44E-03	2.89E-03	2.54E-03	2.35E-03	2.00E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0012***	***0.0026***	***0.0048***	***0.0063***	***0.0061***	***0.0056***	***0.0055***	***0.0046***	***0.0043***	***0.0046***	***0.0048***	***0.0050***	***0.0053***	***0.0055***	***0.0052***	***0.0043***	***0.0036***	***0.0033***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.15E-03	8.64E-04	6.07E-04	4.81E-04	4.17E-04	7.73E-04	1.71E-03	3.21E-03	4.18E-03	4.07E-03	3.76E-03	3.64E-03	3.08E-03	2.87E-03	3.05E-03	3.20E-03	3.33E-03	3.55E-03	3.64E-03	3.47E-03	2.86E-03	2.41E-03	2.23E-03	1.93E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.75E-04	4.32E-04	3.04E-04	2.40E-04	2.09E-04	3.87E-04	8.53E-04	1.60E-03	2.09E-03	2.04E-03	1.88E-03	1.82E-03	1.54E-03	1.44E-03	1.52E-03	1.60E-03	1.67E-03	1.77E-03	1.82E-03	1.73E-03	1.43E-03	1.21E-03	1.11E-03	9.67E-04
	Emission in each Box of 1st jet	g/s	3.83E-04	2.88E-04	2.02E-04	1.60E-04	1.39E-04	2.58E-04	5.69E-04	1.07E-03	1.39E-03	1.36E-03	1.25E-03	1.21E-03	1.03E-03	9.57E-04	1.02E-03	1.07E-03	1.11E-03	1.18E-03	1.21E-03	1.16E-03	9.54E-04	8.04E-04	7.42E-04	6.44E-04
	Emission in each Box of 2nd jet	g/s	1.92E-04	1.44E-04	1.01E-04	8.01E-05	6.96E-05	1.29E-04	2.84E-04	5.34E-04	6.97E-04	6.79E-04	6.27E-04	6.06E-04	5.13E-04	4.79E-04	5.08E-04	5.33E-04	5.55E-04	5.91E-04	6.07E-04	5.78E-04	4.77E-04	4.02E-04	3.71E-04	3.22E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1628	0.1210	0.1237	0.1388	0.1491	0.3492	0.3724	0.2493	0.1851	0.1827	0.1812	0.1853	0.1487	0.1518	0.1491	0.1494	0.1492	0.1496	0.1476	0.1444	0.1496	0.1587	0.1601	0.1549
	NO2	g/vehicle/km	0.0240	0.0222	0.0226	0.0239	0.0244	0.0354	0.0363	0.0290	0.0256	0.0254	0.0251	0.0254	0.0245	0.0247	0.0245	0.0245	0.0246	0.0245	0.0244	0.0243	0.0247	0.0252	0.0252	0.0249
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0118***	***0.0071***	***0.0050***	***0.0042***	***0.0038***	***0.0112***	***0.0255***	***0.0408***	***0.0446***	***0.0427***	***0.0388***	***0.0381***	***0.0267***	***0.0255***	***0.0266***	***0.0280***	***0.0293***	***0.0316***	***0.0330***	***0.0310***	***0.0263***	***0.0229***	***0.0216***	***0.0184***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.86E-03	4.72E-03	3.33E-03	2.80E-03	2.51E-03	7.46E-03	1.70E-02	2.72E-02	2.98E-02	2.85E-02	2.59E-02	2.54E-02	1.78E-02	1.70E-02	1.77E-02	1.87E-02	1.95E-02	2.11E-02	2.20E-02	2.07E-02	1.75E-02	1.53E-02	1.44E-02	1.23E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.93E-03	2.36E-03	1.67E-03	1.40E-03	1.26E-03	3.73E-03	8.51E-03	1.36E-02	1.49E-02	1.42E-02	1.29E-02	1.27E-02	8.91E-03	8.51E-03	8.87E-03	9.33E-03	9.76E-03	1.05E-02	1.10E-02	1.03E-02	8.77E-03	7.63E-03	7.19E-03	6.14E-03
	Emission in each Box of 1st jet	g/s	2.62E-03	1.57E-03	1.11E-03	9.34E-04	8.38E-04	2.49E-03	5.67E-03	9.07E-03	9.92E-03	9.49E-03	8.63E-03	8.46E-03	5.94E-03	5.67E-03	5.92E-03	6.22E-03	6.51E-03	7.02E-03	7.32E-03	6.88E-03	5.85E-03	5.09E-03	4.79E-03	4.09E-03
	Emission in each Box of 2nd jet	g/s	1.31E-03	7.86E-04	5.56E-04	4.67E-04	4.19E-04	1.24E-03	2.84E-03	4.53E-03	4.96E-03	4.75E-03	4.32E-03	4.23E-03	2.97E-03	2.84E-03	2.96E-03	3.11E-03	3.25E-03	3.51E-03	3.66E-03	3.44E-03	2.92E-03	2.54E-03	2.40E-03	2.05E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0025***	***0.0047***	***0.0062***	***0.0059***	***0.0054***	***0.0052***	***0.0044***	***0.0042***	***0.0044***	***0.0046***	***0.0048***	***0.0052***	***0.0054***	***0.0052***	***0.0044***	***0.0036***	***0.0034***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.16E-03	8.66E-04	6.09E-04	4.83E-04	4.11E-04	7.56E-04	1.66E-03	3.16E-03	4.11E-03	3.96E-03	3.59E-03	3.48E-03	2.94E-03	2.77E-03	2.92E-03	3.07E-03	3.22E-03	3.45E-03	3.63E-03	3.47E-03	2.90E-03	2.42E-03	2.27E-03	1.98E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.80E-04	4.33E-04	3.05E-04	2.41E-04	2.05E-04	3.78E-04	8.29E-04	1.58E-03	2.06E-03	1.98E-03	1.80E-03	1.74E-03	1.47E-03	1.39E-03	1.46E-03	1.53E-03	1.61E-03	1.73E-03	1.82E-03	1.74E-03	1.45E-03	1.21E-03	1.13E-03	9.88E-04
	Emission in each Box of 1st jet	g/s	3.87E-04	2.89E-04	2.03E-04	1.61E-04	1.37E-04	2.52E-04	5.53E-04	1.05E-03	1.37E-03	1.32E-03	1.20E-03	1.16E-03	9.79E-04	9.24E-04	9.74E-04	1.02E-03	1.07E-03	1.15E-03	1.21E-03	1.16E-03	9.67E-04	8.07E-04	7.56E-04	6.59E-04
	Emission in each Box of 2nd jet	g/s	1.93E-04	1.44E-04	1.02E-04	8.05E-05	6.85E-05	1.26E-04	2.76E-04	5.27E-04	6.86E-04	6.61E-04	5.98E-04	5.80E-04	4.90E-04	4.62E-04	4.87E-04	5.11E-04	5.36E-04	5.76E-04	6.05E-04	5.79E-04	4.83E-04	4.03E-04	3.78E-04	3.29E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1495	0.1123	0.1159	0.1299	0.1400	0.3321	0.3599	0.2491	0.1839	0.1823	0.1836	0.1856	0.1467	0.1501	0.1458	0.1461	0.1465	0.1448	0.1407	0.1358	0.1395	0.1478	0.1460	0.1382
	NO2	g/vehicle/km	0.0223	0.0208	0.0214	0.0227	0.0231	0.0338	0.0351	0.0290	0.0255	0.0255	0.0255	0.0256	0.0243	0.0245	0.0241	0.0241	0.0242	0.0238	0.0234	0.0231	0.0232	0.0236	0.0232	0.0225
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0108***	***0.0066***	***0.0047***	***0.0039***	***0.0035***	***0.0106***	***0.0247***	***0.0408***	***0.0444***	***0.0426***	***0.0394***	***0.0381***	***0.0264***	***0.0253***	***0.0260***	***0.0274***	***0.0287***	***0.0306***	***0.0314***	***0.0291***	***0.0245***	***0.0213***	***0.0197***	***0.0164***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.21E-03	4.38E-03	3.12E-03	2.62E-03	2.36E-03	7.09E-03	1.65E-02	2.72E-02	2.96E-02	2.84E-02	2.62E-02	2.54E-02	1.76E-02	1.68E-02	1.74E-02	1.83E-02	1.92E-02	2.04E-02	2.10E-02	1.94E-02	1.64E-02	1.42E-02	1.31E-02	1.10E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.61E-03	2.19E-03	1.56E-03	1.31E-03	1.18E-03	3.55E-03	8.23E-03	1.36E-02	1.48E-02	1.42E-02	1.31E-02	1.27E-02	8.79E-03	8.42E-03	8.68E-03	9.13E-03	9.58E-03	1.02E-02	1.05E-02	9.71E-03	8.18E-03	7.11E-03	6.56E-03	5.48E-03
	Emission in each Box of 1st jet	g/s	2.40E-03	1.46E-03	1.04E-03	8.74E-04	7.87E-04	2.36E-03	5.48E-03	9.06E-03	9.86E-03	9.48E-03	8.75E-03	8.47E-03	5.86E-03	5.61E-03	5.79E-03	6.08E-03	6.39E-03	6.80E-03	6.99E-03	6.47E-03	5.45E-03	4.74E-03	4.37E-03	3.65E-03
	Emission in each Box of 2nd jet	g/s	1.20E-03	7.29E-04	5.21E-04	4.37E-04	3.93E-04	1.18E-03	2.74E-03	4.53E-03	4.93E-03	4.74E-03	4.37E-03	4.24E-03	2.93E-03	2.81E-03	2.89E-03	3.04E-03	3.19E-03	3.40E-03	3.49E-03	3.24E-03	2.73E-03	2.37E-03	2.19E-03	1.83E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0024***	***0.0048***	***0.0062***	***0.0060***	***0.0055***	***0.0052***	***0.0044***	***0.0041***	***0.0043***	***0.0045***	***0.0047***	***0.0050***	***0.0052***	***0.0049***	***0.0041***	***0.0034***	***0.0031***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.08E-03	8.12E-04	5.77E-04	4.58E-04	3.89E-04	7.22E-04	1.61E-03	3.17E-03	4.10E-03	3.97E-03	3.65E-03	3.50E-03	2.91E-03	2.75E-03	2.87E-03	3.01E-03	3.17E-03	3.36E-03	3.48E-03	3.30E-03	2.73E-03	2.27E-03	2.09E-03	1.79E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.38E-04	4.06E-04	2.88E-04	2.29E-04	1.95E-04	3.61E-04	8.03E-04	1.58E-03	2.05E-03	1.99E-03	1.82E-03	1.75E-03	1.45E-03	1.38E-03	1.43E-03	1.51E-03	1.58E-03	1.68E-03	1.74E-03	1.65E-03	1.36E-03	1.14E-03	1.04E-03	8.93E-04
	Emission in each Box of 1st jet	g/s	3.59E-04	2.71E-04	1.92E-04	1.53E-04	1.30E-04	2.41E-04	5.35E-04	1.06E-03	1.37E-03	1.32E-03	1.22E-03	1.17E-03	9.69E-04	9.17E-04	9.57E-04	1.00E-03	1.06E-03	1.12E-03	1.16E-03	1.10E-03	9.09E-04	7.57E-04	6.96E-04	5.96E-04
	Emission in each Box of 2nd jet	g/s	1.79E-04	1.35E-04	9.62E-05	7.63E-05	6.49E-05	1.20E-04	2.68E-04	5.28E-04	6.84E-04	6.62E-04	6.08E-04	5.83E-04	4.85E-04	4.59E-04	4.78E-04	5.02E-04	5.28E-04	5.60E-04	5.80E-04	5.50E-04	4.55E-04	3.78E-04	3.48E-04	2.98E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1438	0.1044	0.1059	0.1174	0.1260	0.2991	0.3194	0.2140	0.1618	0.1603	0.1635	0.1676	0.1344	0.1343	0.1340	0.1327	0.1310	0.1290	0.1259	0.1232	0.1277	0.1386	0.1381	0.1321
	NO2	g/vehicle/km	0.0215	0.0195	0.0198	0.0207	0.0211	0.0307	0.0314	0.0252	0.0227	0.0227	0.0230	0.0232	0.0225	0.0222	0.0223	0.0221	0.0219	0.0214	0.0211	0.0211	0.0214	0.0222	0.0220	0.0216
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0104***	***0.0061***	***0.0043***	***0.0036***	***0.0032***	***0.0096***	***0.0219***	***0.0350***	***0.0390***	***0.0375***	***0.0350***	***0.0344***	***0.0242***	***0.0226***	***0.0239***	***0.0249***	***0.0257***	***0.0272***	***0.0281***	***0.0264***	***0.0225***	***0.0200***	***0.0186***	***0.0157***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.94E-03	4.07E-03	2.85E-03	2.37E-03	2.12E-03	6.39E-03	1.46E-02	2.34E-02	2.60E-02	2.50E-02	2.34E-02	2.29E-02	1.61E-02	1.51E-02	1.59E-02	1.66E-02	1.71E-02	1.82E-02	1.87E-02	1.76E-02	1.50E-02	1.33E-02	1.24E-02	1.05E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.47E-03	2.03E-03	1.43E-03	1.18E-03	1.06E-03	3.19E-03	7.30E-03	1.17E-02	1.30E-02	1.25E-02	1.17E-02	1.15E-02	8.05E-03	7.53E-03	7.97E-03	8.29E-03	8.57E-03	9.08E-03	9.37E-03	8.81E-03	7.49E-03	6.66E-03	6.20E-03	5.23E-03
	Emission in each Box of 1st jet	g/s	2.31E-03	1.36E-03	9.51E-04	7.89E-04	7.08E-04	2.13E-03	4.87E-03	7.78E-03	8.67E-03	8.33E-03	7.79E-03	7.65E-03	5.37E-03	5.02E-03	5.32E-03	5.53E-03	5.71E-03	6.06E-03	6.25E-03	5.87E-03	5.00E-03	4.44E-03	4.14E-03	3.49E-03
	Emission in each Box of 2nd jet	g/s	1.16E-03	6.78E-04	4.76E-04	3.95E-04	3.54E-04	1.06E-03	2.43E-03	3.89E-03	4.34E-03	4.17E-03	3.89E-03	3.82E-03	2.68E-03	2.51E-03	2.66E-03	2.76E-03	2.86E-03	3.03E-03	3.12E-03	2.94E-03	2.50E-03	2.22E-03	2.07E-03	1.74E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0010***	***0.0022***	***0.0041***	***0.0055***	***0.0053***	***0.0049***	***0.0048***	***0.0040***	***0.0037***	***0.0040***	***0.0041***	***0.0043***	***0.0045***	***0.0047***	***0.0045***	***0.0038***	***0.0032***	***0.0030***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.04E-03	7.61E-04	5.34E-04	4.19E-04	3.56E-04	6.55E-04	1.44E-03	2.75E-03	3.65E-03	3.53E-03	3.28E-03	3.18E-03	2.69E-03	2.49E-03	2.66E-03	2.76E-03	2.86E-03	3.02E-03	3.14E-03	3.01E-03	2.51E-03	2.14E-03	1.98E-03	1.71E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.20E-04	3.80E-04	2.67E-04	2.09E-04	1.78E-04	3.27E-04	7.18E-04	1.37E-03	1.83E-03	1.77E-03	1.64E-03	1.59E-03	1.35E-03	1.25E-03	1.33E-03	1.38E-03	1.43E-03	1.51E-03	1.57E-03	1.51E-03	1.26E-03	1.07E-03	9.90E-04	8.55E-04
	Emission in each Box of 1st jet	g/s	3.46E-04	2.54E-04	1.78E-04	1.40E-04	1.19E-04	2.18E-04	4.79E-04	9.15E-04	1.22E-03	1.18E-03	1.09E-03	1.06E-03	8.97E-04	8.30E-04	8.86E-04	9.21E-04	9.55E-04	1.01E-03	1.05E-03	1.00E-03	8.38E-04	7.12E-04	6.60E-04	5.70E-04
	Emission in each Box of 2nd jet	g/s	1.73E-04	1.27E-04	8.90E-05	6.98E-05	5.93E-05	1.09E-04	2.39E-04	4.58E-04	6.09E-04	5.89E-04	5.47E-04	5.30E-04	4.48E-04	4.15E-04	4.43E-04	4.61E-04	4.77E-04	5.03E-04	5.23E-04	5.02E-04	4.19E-04	3.56E-04	3.30E-04	2.85E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1309	0.0986	0.1030	0.1131	0.1210	0.2855	0.3048	0.2107	0.1612	0.1579	0.1606	0.1615	0.1296	0.1346	0.1325	0.1324	0.1302	0.1307	0.1307	0.1251	0.1294	0.1389	0.1368	0.1338
	NO2	g/vehicle/km	0.0197	0.0186	0.0193	0.0201	0.0204	0.0294	0.0301	0.0248	0.0226	0.0223	0.0226	0.0225	0.0217	0.0223	0.0221	0.0221	0.0217	0.0217	0.0219	0.0214	0.0217	0.0223	0.0219	0.0219
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0095***	***0.0058***	***0.0042***	***0.0034***	***0.0031***	***0.0091***	***0.0209***	***0.0345***	***0.0389***	***0.0369***	***0.0344***	***0.0332***	***0.0233***	***0.0226***	***0.0237***	***0.0248***	***0.0255***	***0.0276***	***0.0292***	***0.0268***	***0.0228***	***0.0200***	***0.0184***	***0.0159***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.31E-03	3.84E-03	2.78E-03	2.28E-03	2.04E-03	6.10E-03	1.39E-02	2.30E-02	2.59E-02	2.46E-02	2.29E-02	2.21E-02	1.55E-02	1.51E-02	1.58E-02	1.65E-02	1.70E-02	1.84E-02	1.95E-02	1.79E-02	1.52E-02	1.34E-02	1.23E-02	1.06E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.16E-03	1.92E-03	1.39E-03	1.14E-03	1.02E-03	3.05E-03	6.97E-03	1.15E-02	1.30E-02	1.23E-02	1.15E-02	1.11E-02	7.76E-03	7.55E-03	7.89E-03	8.27E-03	8.51E-03	9.20E-03	9.73E-03	8.94E-03	7.59E-03	6.68E-03	6.14E-03	5.30E-03
	Emission in each Box of 1st jet	g/s	2.10E-03	1.28E-03	9.25E-04	7.61E-04	6.80E-04	2.03E-03	4.64E-03	7.67E-03	8.64E-03	8.20E-03	7.65E-03	7.37E-03	5.18E-03	5.03E-03	5.26E-03	5.52E-03	5.67E-03	6.14E-03	6.49E-03	5.96E-03	5.06E-03	4.45E-03	4.10E-03	3.53E-03
	Emission in each Box of 2nd jet	g/s	1.05E-03	6.41E-04	4.63E-04	3.80E-04	3.40E-04	1.02E-03	2.32E-03	3.83E-03	4.32E-03	4.10E-03	3.82E-03	3.69E-03	2.59E-03	2.52E-03	2.63E-03	2.76E-03	2.84E-03	3.07E-03	3.24E-03	2.98E-03	2.53E-03	2.23E-03	2.05E-03	1.77E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0021***	***0.0041***	***0.0055***	***0.0052***	***0.0048***	***0.0046***	***0.0039***	***0.0037***	***0.0040***	***0.0041***	***0.0043***	***0.0046***	***0.0049***	***0.0046***	***0.0038***	***0.0032***	***0.0029***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.51E-04	7.25E-04	5.21E-04	4.06E-04	3.44E-04	6.28E-04	1.38E-03	2.71E-03	3.64E-03	3.48E-03	3.22E-03	3.08E-03	2.59E-03	2.50E-03	2.64E-03	2.76E-03	2.84E-03	3.06E-03	3.26E-03	3.06E-03	2.54E-03	2.14E-03	1.97E-03	1.74E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.76E-04	3.63E-04	2.60E-04	2.03E-04	1.72E-04	3.14E-04	6.88E-04	1.35E-03	1.82E-03	1.74E-03	1.61E-03	1.54E-03	1.30E-03	1.25E-03	1.32E-03	1.38E-03	1.42E-03	1.53E-03	1.63E-03	1.53E-03	1.27E-03	1.07E-03	9.83E-04	8.68E-04
	Emission in each Box of 1st jet	g/s	3.17E-04	2.42E-04	1.74E-04	1.35E-04	1.15E-04	2.09E-04	4.59E-04	9.02E-04	1.21E-03	1.16E-03	1.07E-03	1.03E-03	8.65E-04	8.32E-04	8.78E-04	9.20E-04	9.45E-04	1.02E-03	1.09E-03	1.02E-03	8.48E-04	7.14E-04	6.55E-04	5.79E-04
	Emission in each Box of 2nd jet	g/s	1.59E-04	1.21E-04	8.68E-05	6.76E-05	5.73E-05	1.05E-04	2.29E-04	4.51E-04	6.07E-04	5.81E-04	5.37E-04	5.13E-04	4.32E-04	4.16E-04	4.39E-04	4.60E-04	4.73E-04	5.10E-04	5.43E-04	5.11E-04	4.24E-04	3.57E-04	3.28E-04	2.89E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1278	0.0951	0.0985	0.1080	0.1138	0.2781	0.2927	0.2011	0.1527	0.1579	0.1632	0.1696	0.1344	0.1368	0.1353	0.1363	0.1290	0.1291	0.1264	0.1202	0.1208	0.1298	0.1281	0.1216
	NO2	g/vehicle/km	0.0193	0.0180	0.0186	0.0193	0.0193	0.0287	0.0290	0.0237	0.0215	0.0224	0.0229	0.0235	0.0225	0.0226	0.0225	0.0227	0.0215	0.0214	0.0212	0.0206	0.0204	0.0210	0.0206	0.0200
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0093***	***0.0056***	***0.0040***	***0.0033***	***0.0029***	***0.0089***	***0.0201***	***0.0329***	***0.0368***	***0.0369***	***0.0350***	***0.0348***	***0.0242***	***0.0230***	***0.0242***	***0.0255***	***0.0253***	***0.0273***	***0.0282***	***0.0258***	***0.0213***	***0.0187***	***0.0173***	***0.0145***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.17E-03	3.70E-03	2.65E-03	2.18E-03	1.92E-03	5.94E-03	1.34E-02	2.19E-02	2.46E-02	2.46E-02	2.33E-02	2.32E-02	1.61E-02	1.53E-02	1.61E-02	1.70E-02	1.69E-02	1.82E-02	1.88E-02	1.72E-02	1.42E-02	1.25E-02	1.15E-02	9.64E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.08E-03	1.85E-03	1.33E-03	1.09E-03	9.60E-04	2.97E-03	6.69E-03	1.10E-02	1.23E-02	1.23E-02	1.17E-02	1.16E-02	8.05E-03	7.67E-03	8.05E-03	8.51E-03	8.44E-03	9.09E-03	9.41E-03	8.59E-03	7.09E-03	6.24E-03	5.76E-03	4.82E-03
	Emission in each Box of 1st jet	g/s	2.06E-03	1.23E-03	8.85E-04	7.27E-04	6.40E-04	1.98E-03	4.46E-03	7.31E-03	8.18E-03	8.21E-03	7.77E-03	7.74E-03	5.37E-03	5.11E-03	5.37E-03	5.68E-03	5.62E-03	6.06E-03	6.27E-03	5.73E-03	4.72E-03	4.16E-03	3.84E-03	3.21E-03
	Emission in each Box of 2nd jet	g/s	1.03E-03	6.17E-04	4.42E-04	3.63E-04	3.20E-04	9.90E-04	2.23E-03	3.66E-03	4.09E-03	4.10E-03	3.89E-03	3.87E-03	2.68E-03	2.56E-03	2.68E-03	2.84E-03	2.81E-03	3.03E-03	3.14E-03	2.86E-03	2.36E-03	2.08E-03	1.92E-03	1.61E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0020***	***0.0039***	***0.0052***	***0.0052***	***0.0049***	***0.0048***	***0.0040***	***0.0038***	***0.0040***	***0.0042***	***0.0042***	***0.0045***	***0.0047***	***0.0044***	***0.0036***	***0.0030***	***0.0028***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.32E-04	7.02E-04	5.01E-04	3.90E-04	3.26E-04	6.12E-04	1.32E-03	2.59E-03	3.45E-03	3.49E-03	3.27E-03	3.22E-03	2.69E-03	2.53E-03	2.68E-03	2.83E-03	2.81E-03	3.02E-03	3.15E-03	2.94E-03	2.39E-03	2.02E-03	1.85E-03	1.59E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.66E-04	3.51E-04	2.51E-04	1.95E-04	1.63E-04	3.06E-04	6.62E-04	1.30E-03	1.73E-03	1.74E-03	1.64E-03	1.61E-03	1.35E-03	1.27E-03	1.34E-03	1.42E-03	1.41E-03	1.51E-03	1.58E-03	1.47E-03	1.20E-03	1.01E-03	9.25E-04	7.93E-04
	Emission in each Box of 1st jet	g/s	3.11E-04	2.34E-04	1.67E-04	1.30E-04	1.09E-04	2.04E-04	4.41E-04	8.63E-04	1.15E-03	1.16E-03	1.09E-03	1.07E-03	8.97E-04	8.44E-04	8.95E-04	9.44E-04	9.38E-04	1.01E-03	1.05E-03	9.81E-04	7.97E-04	6.72E-04	6.17E-04	5.29E-04
	Emission in each Box of 2nd jet	g/s	1.55E-04	1.17E-04	8.36E-05	6.50E-05	5.43E-05	1.02E-04	2.21E-04	4.32E-04	5.75E-04	5.81E-04	5.45E-04	5.36E-04	4.48E-04	4.22E-04	4.47E-04	4.72E-04	4.69E-04	5.03E-04	5.25E-04	4.91E-04	3.98E-04	3.36E-04	3.08E-04	2.64E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1353	0.0978	0.1021	0.1140	0.1210	0.2843	0.3035	0.2001	0.1542	0.1547	0.1595	0.1622	0.1307	0.1366	0.1354	0.1344	0.1378	0.1352	0.1337	0.1273	0.1268	0.1318	0.1330	0.1281
	NO2	g/vehicle/km	0.0203	0.0185	0.0192	0.0203	0.0204	0.0293	0.0300	0.0236	0.0217	0.0219	0.0224	0.0226	0.0218	0.0226	0.0226	0.0224	0.0229	0.0224	0.0223	0.0218	0.0213	0.0212	0.0213	0.0210
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0098***	***0.0057***	***0.0041***	***0.0035***	***0.0031***	***0.0091***	***0.0208***	***0.0328***	***0.0372***	***0.0362***	***0.0342***	***0.0333***	***0.0235***	***0.0230***	***0.0242***	***0.0252***	***0.0270***	***0.0286***	***0.0299***	***0.0273***	***0.0223***	***0.0190***	***0.0179***	***0.0152***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.53E-03	3.81E-03	2.75E-03	2.30E-03	2.04E-03	6.07E-03	1.39E-02	2.18E-02	2.48E-02	2.41E-02	2.28E-02	2.22E-02	1.57E-02	1.53E-02	1.61E-02	1.68E-02	1.80E-02	1.90E-02	1.99E-02	1.82E-02	1.49E-02	1.27E-02	1.19E-02	1.01E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.26E-03	1.91E-03	1.38E-03	1.15E-03	1.02E-03	3.04E-03	6.94E-03	1.09E-02	1.24E-02	1.21E-02	1.14E-02	1.11E-02	7.83E-03	7.66E-03	8.06E-03	8.39E-03	9.01E-03	9.52E-03	9.95E-03	9.10E-03	7.44E-03	6.34E-03	5.97E-03	5.07E-03
	Emission in each Box of 1st jet	g/s	2.18E-03	1.27E-03	9.17E-04	7.67E-04	6.80E-04	2.02E-03	4.62E-03	7.28E-03	8.26E-03	8.04E-03	7.60E-03	7.41E-03	5.22E-03	5.11E-03	5.37E-03	5.60E-03	6.01E-03	6.35E-03	6.63E-03	6.07E-03	4.96E-03	4.23E-03	3.98E-03	3.38E-03
	Emission in each Box of 2nd jet	g/s	1.09E-03	6.35E-04	4.59E-04	3.83E-04	3.40E-04	1.01E-03	2.31E-03	3.64E-03	4.13E-03	4.02E-03	3.80E-03	3.70E-03	2.61E-03	2.55E-03	2.69E-03	2.80E-03	3.00E-03	3.17E-03	3.32E-03	3.03E-03	2.48E-03	2.11E-03	1.99E-03	1.69E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0021***	***0.0039***	***0.0052***	***0.0051***	***0.0048***	***0.0046***	***0.0039***	***0.0038***	***0.0040***	***0.0042***	***0.0045***	***0.0047***	***0.0050***	***0.0047***	***0.0037***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.81E-04	7.19E-04	5.17E-04	4.09E-04	3.44E-04	6.25E-04	1.37E-03	2.58E-03	3.48E-03	3.42E-03	3.20E-03	3.09E-03	2.61E-03	2.53E-03	2.69E-03	2.80E-03	3.00E-03	3.16E-03	3.33E-03	3.11E-03	2.50E-03	2.04E-03	1.92E-03	1.66E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.91E-04	3.60E-04	2.58E-04	2.04E-04	1.72E-04	3.12E-04	6.85E-04	1.29E-03	1.74E-03	1.71E-03	1.60E-03	1.55E-03	1.31E-03	1.27E-03	1.34E-03	1.40E-03	1.50E-03	1.58E-03	1.66E-03	1.56E-03	1.25E-03	1.02E-03	9.58E-04	8.32E-04
	Emission in each Box of 1st jet	g/s	3.27E-04	2.40E-04	1.72E-04	1.36E-04	1.15E-04	2.08E-04	4.57E-04	8.59E-04	1.16E-03	1.14E-03	1.07E-03	1.03E-03	8.71E-04	8.43E-04	8.96E-04	9.32E-04	1.00E-03	1.05E-03	1.11E-03	1.04E-03	8.33E-04	6.81E-04	6.39E-04	5.55E-04
	Emission in each Box of 2nd jet	g/s	1.64E-04	1.20E-04	8.62E-05	6.81E-05	5.73E-05	1.04E-04	2.28E-04	4.30E-04	5.80E-04	5.70E-04	5.34E-04	5.15E-04	4.36E-04	4.22E-04	4.48E-04	4.66E-04	5.00E-04	5.27E-04	5.54E-04	5.19E-04	4.16E-04	3.40E-04	3.19E-04	2.77E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1344	0.1000	0.1006	0.1091	0.1203	0.2768	0.2969	0.1967	0.1475	0.1478	0.1581	0.1549	0.1284	0.1327	0.1345	0.1274	0.1238	0.1279	0.1274	0.1214	0.1267	0.1331	0.1326	0.1266
	NO2	g/vehicle/km	0.0202	0.0188	0.0189	0.0195	0.0203	0.0285	0.0294	0.0233	0.0208	0.0210	0.0222	0.0215	0.0215	0.0219	0.0224	0.0212	0.0207	0.0212	0.0214	0.0208	0.0213	0.0214	0.0213	0.0208
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0097***	***0.0058***	***0.0041***	***0.0033***	***0.0030***	***0.0089***	***0.0204***	***0.0322***	***0.0356***	***0.0346***	***0.0339***	***0.0318***	***0.0231***	***0.0223***	***0.0240***	***0.0239***	***0.0243***	***0.0270***	***0.0285***	***0.0260***	***0.0223***	***0.0192***	***0.0179***	***0.0151***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.48E-03	3.90E-03	2.71E-03	2.20E-03	2.03E-03	5.91E-03	1.36E-02	2.15E-02	2.37E-02	2.30E-02	2.26E-02	2.12E-02	1.54E-02	1.49E-02	1.60E-02	1.59E-02	1.62E-02	1.80E-02	1.90E-02	1.74E-02	1.49E-02	1.28E-02	1.19E-02	1.00E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.24E-03	1.95E-03	1.36E-03	1.10E-03	1.01E-03	2.96E-03	6.78E-03	1.07E-02	1.19E-02	1.15E-02	1.13E-02	1.06E-02	7.69E-03	7.44E-03	8.01E-03	7.96E-03	8.09E-03	9.01E-03	9.49E-03	8.68E-03	7.43E-03	6.40E-03	5.96E-03	5.02E-03
	Emission in each Box of 1st jet	g/s	2.16E-03	1.30E-03	9.04E-04	7.34E-04	6.76E-04	1.97E-03	4.52E-03	7.16E-03	7.90E-03	7.68E-03	7.53E-03	7.07E-03	5.13E-03	4.96E-03	5.34E-03	5.30E-03	5.40E-03	6.00E-03	6.33E-03	5.79E-03	4.95E-03	4.27E-03	3.97E-03	3.35E-03
	Emission in each Box of 2nd jet	g/s	1.08E-03	6.50E-04	4.52E-04	3.67E-04	3.38E-04	9.86E-04	2.26E-03	3.58E-03	3.95E-03	3.84E-03	3.76E-03	3.53E-03	2.56E-03	2.48E-03	2.67E-03	2.65E-03	2.70E-03	3.00E-03	3.16E-03	2.89E-03	2.48E-03	2.13E-03	1.99E-03	1.67E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0020***	***0.0038***	***0.0050***	***0.0049***	***0.0048***	***0.0044***	***0.0039***	***0.0037***	***0.0040***	***0.0040***	***0.0041***	***0.0045***	***0.0048***	***0.0045***	***0.0037***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.75E-04	7.34E-04	5.10E-04	3.93E-04	3.42E-04	6.10E-04	1.34E-03	2.54E-03	3.35E-03	3.27E-03	3.18E-03	2.95E-03	2.57E-03	2.46E-03	2.67E-03	2.65E-03	2.71E-03	2.99E-03	3.19E-03	2.97E-03	2.50E-03	2.06E-03	1.91E-03	1.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.87E-04	3.67E-04	2.55E-04	1.97E-04	1.71E-04	3.05E-04	6.71E-04	1.27E-03	1.67E-03	1.63E-03	1.59E-03	1.47E-03	1.29E-03	1.23E-03	1.33E-03	1.33E-03	1.35E-03	1.50E-03	1.59E-03	1.49E-03	1.25E-03	1.03E-03	9.55E-04	8.23E-04
	Emission in each Box of 1st jet	g/s	3.25E-04	2.45E-04	1.70E-04	1.31E-04	1.14E-04	2.03E-04	4.47E-04	8.46E-04	1.12E-03	1.09E-03	1.06E-03	9.83E-04	8.57E-04	8.20E-04	8.90E-04	8.84E-04	9.03E-04	9.98E-04	1.06E-03	9.91E-04	8.32E-04	6.87E-04	6.37E-04	5.48E-04
	Emission in each Box of 2nd jet	g/s	1.62E-04	1.22E-04	8.51E-05	6.56E-05	5.69E-05	1.02E-04	2.24E-04	4.23E-04	5.58E-04	5.45E-04	5.30E-04	4.92E-04	4.29E-04	4.10E-04	4.45E-04	4.42E-04	4.51E-04	4.99E-04	5.31E-04	4.96E-04	4.16E-04	3.43E-04	3.18E-04	2.74E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1535	0.1163	0.1179	0.1300	0.1401	0.3341	0.3546	0.2355	0.1765	0.1748	0.1774	0.1821	0.1473	0.1488	0.1454	0.1472	0.1434	0.1441	0.1438	0.1379	0.1430	0.1502	0.1511	0.1470
	NO2	g/vehicle/km	0.0228	0.0214	0.0217	0.0226	0.0231	0.0339	0.0346	0.0275	0.0245	0.0245	0.0247	0.0250	0.0243	0.0243	0.0240	0.0243	0.0237	0.0237	0.0238	0.0234	0.0237	0.0239	0.0239	0.0238
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0111***	***0.0068***	***0.0048***	***0.0039***	***0.0035***	***0.0107***	***0.0243***	***0.0386***	***0.0426***	***0.0409***	***0.0380***	***0.0374***	***0.0265***	***0.0250***	***0.0260***	***0.0276***	***0.0281***	***0.0304***	***0.0321***	***0.0296***	***0.0252***	***0.0217***	***0.0204***	***0.0175***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.41E-03	4.53E-03	3.18E-03	2.62E-03	2.36E-03	7.14E-03	1.62E-02	2.57E-02	2.84E-02	2.72E-02	2.53E-02	2.49E-02	1.77E-02	1.67E-02	1.73E-02	1.84E-02	1.88E-02	2.03E-02	2.14E-02	1.97E-02	1.68E-02	1.44E-02	1.36E-02	1.16E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.70E-03	2.27E-03	1.59E-03	1.31E-03	1.18E-03	3.57E-03	8.10E-03	1.29E-02	1.42E-02	1.36E-02	1.27E-02	1.25E-02	8.83E-03	8.35E-03	8.65E-03	9.19E-03	9.38E-03	1.01E-02	1.07E-02	9.86E-03	8.39E-03	7.22E-03	6.79E-03	5.82E-03
	Emission in each Box of 1st jet	g/s	2.47E-03	1.51E-03	1.06E-03	8.74E-04	7.87E-04	2.38E-03	5.40E-03	8.57E-03	9.46E-03	9.08E-03	8.45E-03	8.31E-03	5.88E-03	5.56E-03	5.77E-03	6.13E-03	6.25E-03	6.77E-03	7.14E-03	6.57E-03	5.59E-03	4.81E-03	4.52E-03	3.88E-03
	Emission in each Box of 2nd jet	g/s	1.23E-03	7.55E-04	5.29E-04	4.37E-04	3.94E-04	1.19E-03	2.70E-03	4.28E-03	4.73E-03	4.54E-03	4.22E-03	4.16E-03	2.94E-03	2.78E-03	2.88E-03	3.06E-03	3.13E-03	3.38E-03	3.57E-03	3.29E-03	2.80E-03	2.41E-03	2.26E-03	1.94E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0024***	***0.0045***	***0.0059***	***0.0057***	***0.0053***	***0.0051***	***0.0044***	***0.0041***	***0.0043***	***0.0045***	***0.0047***	***0.0050***	***0.0053***	***0.0050***	***0.0042***	***0.0035***	***0.0032***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.10E-03	8.35E-04	5.84E-04	4.57E-04	3.89E-04	7.25E-04	1.58E-03	3.00E-03	3.95E-03	3.82E-03	3.52E-03	3.42E-03	2.92E-03	2.73E-03	2.86E-03	3.03E-03	3.10E-03	3.34E-03	3.54E-03	3.34E-03	2.78E-03	2.30E-03	2.15E-03	1.88E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.50E-04	4.17E-04	2.92E-04	2.28E-04	1.95E-04	3.62E-04	7.92E-04	1.50E-03	1.97E-03	1.91E-03	1.76E-03	1.71E-03	1.46E-03	1.36E-03	1.43E-03	1.52E-03	1.55E-03	1.67E-03	1.77E-03	1.67E-03	1.39E-03	1.15E-03	1.08E-03	9.42E-04
	Emission in each Box of 1st jet	g/s	3.66E-04	2.78E-04	1.95E-04	1.52E-04	1.30E-04	2.42E-04	5.28E-04	9.99E-04	1.32E-03	1.27E-03	1.17E-03	1.14E-03	9.72E-04	9.09E-04	9.53E-04	1.01E-03	1.03E-03	1.11E-03	1.18E-03	1.11E-03	9.28E-04	7.67E-04	7.17E-04	6.28E-04
	Emission in each Box of 2nd jet	g/s	1.83E-04	1.39E-04	9.74E-05	7.61E-05	6.49E-05	1.21E-04	2.64E-04	5.00E-04	6.58E-04	6.37E-04	5.87E-04	5.71E-04	4.86E-04	4.54E-04	4.76E-04	5.05E-04	5.17E-04	5.57E-04	5.90E-04	5.56E-04	4.64E-04	3.84E-04	3.58E-04	3.14E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1683	0.1252	0.1290	0.1430	0.1536	0.3616	0.3877	0.2549	0.1914	0.1889	0.1923	0.1944	0.1584	0.1615	0.1585	0.1578	0.1543	0.1541	0.1536	0.1501	0.1537	0.1644	0.1644	0.1591
	NO2	g/vehicle/km	0.0247	0.0229	0.0234	0.0246	0.0250	0.0366	0.0377	0.0296	0.0263	0.0262	0.0265	0.0265	0.0259	0.0261	0.0259	0.0258	0.0253	0.0252	0.0252	0.0252	0.0253	0.0260	0.0259	0.0255
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0122***	***0.0073***	***0.0052***	***0.0043***	***0.0039***	***0.0116***	***0.0266***	***0.0417***	***0.0462***	***0.0442***	***0.0412***	***0.0399***	***0.0285***	***0.0272***	***0.0283***	***0.0296***	***0.0303***	***0.0326***	***0.0343***	***0.0322***	***0.0270***	***0.0237***	***0.0222***	***0.0189***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.12E-03	4.88E-03	3.48E-03	2.89E-03	2.59E-03	7.73E-03	1.77E-02	2.78E-02	3.08E-02	2.95E-02	2.75E-02	2.66E-02	1.90E-02	1.81E-02	1.89E-02	1.97E-02	2.02E-02	2.17E-02	2.29E-02	2.15E-02	1.80E-02	1.58E-02	1.48E-02	1.26E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.06E-03	2.44E-03	1.74E-03	1.44E-03	1.29E-03	3.86E-03	8.86E-03	1.39E-02	1.54E-02	1.47E-02	1.37E-02	1.33E-02	9.49E-03	9.06E-03	9.44E-03	9.86E-03	1.01E-02	1.09E-02	1.14E-02	1.07E-02	9.01E-03	7.91E-03	7.39E-03	6.30E-03
	Emission in each Box of 1st jet	g/s	2.71E-03	1.63E-03	1.16E-03	9.62E-04	8.63E-04	2.58E-03	5.91E-03	9.27E-03	1.03E-02	9.82E-03	9.16E-03	8.87E-03	6.33E-03	6.04E-03	6.29E-03	6.57E-03	6.73E-03	7.24E-03	7.62E-03	7.16E-03	6.01E-03	5.27E-03	4.92E-03	4.20E-03
	Emission in each Box of 2nd jet	g/s	1.35E-03	8.13E-04	5.79E-04	4.81E-04	4.32E-04	1.29E-03	2.95E-03	4.64E-03	5.13E-03	4.91E-03	4.58E-03	4.44E-03	3.16E-03	3.02E-03	3.15E-03	3.29E-03	3.36E-03	3.62E-03	3.81E-03	3.58E-03	3.00E-03	2.64E-03	2.46E-03	2.10E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0012***	***0.0026***	***0.0048***	***0.0064***	***0.0061***	***0.0057***	***0.0054***	***0.0047***	***0.0044***	***0.0046***	***0.0048***	***0.0050***	***0.0053***	***0.0056***	***0.0054***	***0.0045***	***0.0037***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.19E-03	8.91E-04	6.30E-04	4.96E-04	4.22E-04	7.81E-04	1.72E-03	3.23E-03	4.24E-03	4.09E-03	3.79E-03	3.63E-03	3.11E-03	2.93E-03	3.09E-03	3.22E-03	3.31E-03	3.54E-03	3.76E-03	3.60E-03	2.97E-03	2.50E-03	2.32E-03	2.02E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.97E-04	4.46E-04	3.15E-04	2.48E-04	2.11E-04	3.91E-04	8.61E-04	1.62E-03	2.12E-03	2.04E-03	1.89E-03	1.82E-03	1.55E-03	1.47E-03	1.54E-03	1.61E-03	1.65E-03	1.77E-03	1.88E-03	1.80E-03	1.48E-03	1.25E-03	1.16E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	3.98E-04	2.97E-04	2.10E-04	1.65E-04	1.41E-04	2.60E-04	5.74E-04	1.08E-03	1.41E-03	1.36E-03	1.26E-03	1.21E-03	1.04E-03	9.77E-04	1.03E-03	1.07E-03	1.10E-03	1.18E-03	1.25E-03	1.20E-03	9.90E-04	8.32E-04	7.74E-04	6.74E-04
	Emission in each Box of 2nd jet	g/s	1.99E-04	1.49E-04	1.05E-04	8.26E-05	7.03E-05	1.30E-04	2.87E-04	5.38E-04	7.06E-04	6.81E-04	6.31E-04	6.05E-04	5.18E-04	4.88E-04	5.15E-04	5.37E-04	5.52E-04	5.91E-04	6.27E-04	6.00E-04	4.95E-04	4.16E-04	3.87E-04	3.37E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1752	0.1315	0.1355	0.1504	0.1606	0.3728	0.3996	0.2645	0.1976	0.1948	0.1982	0.2018	0.1638	0.1661	0.1631	0.1628	0.1602	0.1617	0.1592	0.1556	0.1594	0.1704	0.1708	0.1657
	NO2	g/vehicle/km	0.0255	0.0237	0.0242	0.0255	0.0258	0.0375	0.0386	0.0305	0.0270	0.0269	0.0271	0.0273	0.0266	0.0267	0.0265	0.0264	0.0261	0.0262	0.0260	0.0259	0.0261	0.0267	0.0266	0.0264
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0127***	***0.0077***	***0.0055***	***0.0046***	***0.0041***	***0.0119***	***0.0274***	***0.0433***	***0.0477***	***0.0455***	***0.0425***	***0.0415***	***0.0294***	***0.0279***	***0.0291***	***0.0305***	***0.0314***	***0.0342***	***0.0356***	***0.0334***	***0.0281***	***0.0246***	***0.0230***	***0.0197***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.45E-03	5.13E-03	3.65E-03	3.04E-03	2.71E-03	7.96E-03	1.83E-02	2.89E-02	3.18E-02	3.04E-02	2.83E-02	2.76E-02	1.96E-02	1.86E-02	1.94E-02	2.03E-02	2.10E-02	2.28E-02	2.37E-02	2.22E-02	1.87E-02	1.64E-02	1.53E-02	1.31E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.23E-03	2.56E-03	1.83E-03	1.52E-03	1.35E-03	3.98E-03	9.13E-03	1.44E-02	1.59E-02	1.52E-02	1.42E-02	1.38E-02	9.81E-03	9.31E-03	9.71E-03	1.02E-02	1.05E-02	1.14E-02	1.19E-02	1.11E-02	9.35E-03	8.19E-03	7.67E-03	6.57E-03
	Emission in each Box of 1st jet	g/s	2.82E-03	1.71E-03	1.22E-03	1.01E-03	9.03E-04	2.65E-03	6.09E-03	9.62E-03	1.06E-02	1.01E-02	9.44E-03	9.21E-03	6.54E-03	6.21E-03	6.47E-03	6.78E-03	6.98E-03	7.59E-03	7.90E-03	7.41E-03	6.23E-03	5.46E-03	5.11E-03	4.38E-03
	Emission in each Box of 2nd jet	g/s	1.41E-03	8.54E-04	6.09E-04	5.06E-04	4.51E-04	1.33E-03	3.04E-03	4.81E-03	5.30E-03	5.06E-03	4.72E-03	4.61E-03	3.27E-03	3.10E-03	3.24E-03	3.39E-03	3.49E-03	3.80E-03	3.95E-03	3.71E-03	3.12E-03	2.73E-03	2.56E-03	2.19E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0012***	***0.0026***	***0.0050***	***0.0065***	***0.0063***	***0.0058***	***0.0056***	***0.0048***	***0.0045***	***0.0047***	***0.0050***	***0.0051***	***0.0055***	***0.0058***	***0.0055***	***0.0046***	***0.0039***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.23E-03	9.23E-04	6.53E-04	5.14E-04	4.35E-04	8.01E-04	1.77E-03	3.33E-03	4.34E-03	4.19E-03	3.88E-03	3.74E-03	3.19E-03	3.00E-03	3.16E-03	3.30E-03	3.41E-03	3.69E-03	3.87E-03	3.70E-03	3.06E-03	2.57E-03	2.39E-03	2.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.16E-04	4.62E-04	3.26E-04	2.57E-04	2.18E-04	4.01E-04	8.83E-04	1.66E-03	2.17E-03	2.09E-03	1.94E-03	1.87E-03	1.59E-03	1.50E-03	1.58E-03	1.65E-03	1.71E-03	1.84E-03	1.93E-03	1.85E-03	1.53E-03	1.28E-03	1.19E-03	1.04E-03
	Emission in each Box of 1st jet	g/s	4.11E-04	3.08E-04	2.18E-04	1.71E-04	1.45E-04	2.67E-04	5.88E-04	1.11E-03	1.45E-03	1.40E-03	1.29E-03	1.25E-03	1.06E-03	9.98E-04	1.05E-03	1.10E-03	1.14E-03	1.23E-03	1.29E-03	1.23E-03	1.02E-03	8.56E-04	7.96E-04	6.97E-04
	Emission in each Box of 2nd jet	g/s	2.05E-04	1.54E-04	1.09E-04	8.56E-05	7.25E-05	1.34E-04	2.94E-04	5.55E-04	7.24E-04	6.98E-04	6.46E-04	6.24E-04	5.31E-04	4.99E-04	5.27E-04	5.51E-04	5.69E-04	6.15E-04	6.45E-04	6.16E-04	5.09E-04	4.28E-04	3.98E-04	3.48E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2571	0.2154	0.2184	0.2283	0.2366	0.4477	0.4770	0.4119	0.4156	0.3984	0.3884	0.3795	0.3468	0.3371	0.3412	0.3672	0.3794	0.3903	0.4012	0.3801	0.3406	0.3229	0.3260	0.2996
	NO2	g/vehicle/km	0.0462	0.0445	0.0441	0.0452	0.0465	0.0574	0.0587	0.0628	0.0747	0.0717	0.0692	0.0668	0.0681	0.0654	0.0672	0.0718	0.0744	0.0769	0.0797	0.0762	0.0669	0.0611	0.0612	0.0570
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0134***	***0.0091***	***0.0064***	***0.0049***	***0.0043***	***0.0101***	***0.0230***	***0.0482***	***0.0720***	***0.0670***	***0.0599***	***0.0560***	***0.0493***	***0.0448***	***0.0481***	***0.0544***	***0.0588***	***0.0652***	***0.0708***	***0.0644***	***0.0473***	***0.0368***	***0.0347***	***0.0281***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.93E-03	6.09E-03	4.23E-03	3.27E-03	2.86E-03	6.74E-03	1.53E-02	3.21E-02	4.80E-02	4.47E-02	3.99E-02	3.73E-02	3.29E-02	2.98E-02	3.21E-02	3.63E-02	3.92E-02	4.34E-02	4.72E-02	4.29E-02	3.16E-02	2.45E-02	2.31E-02	1.88E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.46E-03	3.04E-03	2.12E-03	1.64E-03	1.43E-03	3.37E-03	7.66E-03	1.61E-02	2.40E-02	2.23E-02	2.00E-02	1.87E-02	1.64E-02	1.49E-02	1.60E-02	1.81E-02	1.96E-02	2.17E-02	2.36E-02	2.15E-02	1.58E-02	1.23E-02	1.16E-02	9.38E-03
	Emission in each Box of 1st jet	g/s	1.28E-03	8.69E-04	6.05E-04	4.67E-04	4.08E-04	9.62E-04	2.19E-03	4.59E-03	6.86E-03	6.38E-03	5.70E-03	5.34E-03	4.69E-03	4.26E-03	4.58E-03	5.18E-03	5.60E-03	6.21E-03	6.74E-03	6.13E-03	4.51E-03	3.51E-03	3.31E-03	2.68E-03
	Emission in each Box of 2nd jet	g/s	2.23E-03	1.52E-03	1.06E-03	8.18E-04	7.14E-04	1.68E-03	3.83E-03	8.03E-03	1.20E-02	1.12E-02	9.98E-03	9.34E-03	8.22E-03	7.46E-03	8.02E-03	9.07E-03	9.81E-03	1.09E-02	1.18E-02	1.07E-02	7.89E-03	6.13E-03	5.79E-03	4.69E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0013***	***0.0028***	***0.0073***	***0.0129***	***0.0121***	***0.0107***	***0.0099***	***0.0097***	***0.0087***	***0.0095***	***0.0106***	***0.0115***	***0.0128***	***0.0141***	***0.0129***	***0.0093***	***0.0070***	***0.0065***	***0.0054***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.60E-03	1.26E-03	8.54E-04	6.48E-04	5.61E-04	8.64E-04	1.89E-03	4.89E-03	8.63E-03	8.04E-03	7.11E-03	6.58E-03	6.46E-03	5.79E-03	6.31E-03	7.09E-03	7.69E-03	8.56E-03	9.38E-03	8.61E-03	6.20E-03	4.65E-03	4.35E-03	3.57E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.02E-04	6.28E-04	4.27E-04	3.24E-04	2.80E-04	4.32E-04	9.43E-04	2.45E-03	4.32E-03	4.02E-03	3.56E-03	3.29E-03	3.23E-03	2.90E-03	3.16E-03	3.54E-03	3.85E-03	4.28E-03	4.69E-03	4.30E-03	3.10E-03	2.32E-03	2.17E-03	1.78E-03
	Emission in each Box of 1st jet	g/s	2.29E-04	1.79E-04	1.22E-04	9.26E-05	8.01E-05	1.23E-04	2.69E-04	6.99E-04	1.23E-03	1.15E-03	1.02E-03	9.39E-04	9.22E-04	8.27E-04	9.02E-04	1.01E-03	1.10E-03	1.22E-03	1.34E-03	1.23E-03	8.86E-04	6.64E-04	6.21E-04	5.10E-04
	Emission in each Box of 2nd jet	g/s	4.01E-04	3.14E-04	2.14E-04	1.62E-04	1.40E-04	2.16E-04	4.71E-04	1.22E-03	2.16E-03	2.01E-03	1.78E-03	1.64E-03	1.61E-03	1.45E-03	1.58E-03	1.77E-03	1.92E-03	2.14E-03	2.35E-03	2.15E-03	1.55E-03	1.16E-03	1.09E-03	8.92E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2406	0.1997	0.2019	0.2134	0.2209	0.4190	0.4425	0.3859	0.3858	0.3654	0.3584	0.3502	0.3201	0.3135	0.3198	0.3413	0.3523	0.3643	0.3741	0.3569	0.3194	0.3034	0.3030	0.2783
	NO2	g/vehicle/km	0.0435	0.0416	0.0412	0.0426	0.0438	0.0540	0.0548	0.0591	0.0698	0.0662	0.0643	0.0620	0.0633	0.0612	0.0632	0.0671	0.0695	0.0722	0.0748	0.0720	0.0631	0.0578	0.0573	0.0532
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0125***	***0.0085***	***0.0059***	***0.0046***	***0.0040***	***0.0095***	***0.0213***	***0.0451***	***0.0669***	***0.0614***	***0.0552***	***0.0517***	***0.0455***	***0.0416***	***0.0451***	***0.0506***	***0.0546***	***0.0608***	***0.0660***	***0.0604***	***0.0444***	***0.0346***	***0.0323***	***0.0261***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.35E-03	5.64E-03	3.91E-03	3.06E-03	2.67E-03	6.31E-03	1.42E-02	3.01E-02	4.46E-02	4.10E-02	3.68E-02	3.45E-02	3.03E-02	2.78E-02	3.01E-02	3.37E-02	3.64E-02	4.06E-02	4.40E-02	4.03E-02	2.96E-02	2.31E-02	2.15E-02	1.74E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.18E-03	2.82E-03	1.96E-03	1.53E-03	1.33E-03	3.15E-03	7.11E-03	1.50E-02	2.23E-02	2.05E-02	1.84E-02	1.72E-02	1.52E-02	1.39E-02	1.50E-02	1.69E-02	1.82E-02	2.03E-02	2.20E-02	2.01E-02	1.48E-02	1.15E-02	1.08E-02	8.72E-03
	Emission in each Box of 1st jet	g/s	1.19E-03	8.06E-04	5.59E-04	4.37E-04	3.81E-04	9.01E-04	2.03E-03	4.30E-03	6.37E-03	5.85E-03	5.26E-03	4.92E-03	4.33E-03	3.96E-03	4.29E-03	4.82E-03	5.20E-03	5.79E-03	6.29E-03	5.76E-03	4.23E-03	3.29E-03	3.07E-03	2.49E-03
	Emission in each Box of 2nd jet	g/s	2.09E-03	1.41E-03	9.78E-04	7.65E-04	6.66E-04	1.58E-03	3.55E-03	7.52E-03	1.11E-02	1.02E-02	9.21E-03	8.62E-03	7.58E-03	6.94E-03	7.52E-03	8.43E-03	9.10E-03	1.01E-02	1.10E-02	1.01E-02	7.40E-03	5.76E-03	5.38E-03	4.36E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0026***	***0.0069***	***0.0121***	***0.0111***	***0.0099***	***0.0092***	***0.0090***	***0.0081***	***0.0089***	***0.0099***	***0.0108***	***0.0121***	***0.0132***	***0.0122***	***0.0088***	***0.0066***	***0.0061***	***0.0050***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.51E-03	1.18E-03	7.98E-04	6.11E-04	5.28E-04	8.12E-04	1.76E-03	4.60E-03	8.06E-03	7.42E-03	6.60E-03	6.10E-03	6.00E-03	5.42E-03	5.94E-03	6.63E-03	7.18E-03	8.03E-03	8.80E-03	8.13E-03	5.85E-03	4.39E-03	4.07E-03	3.34E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.56E-04	5.88E-04	3.99E-04	3.05E-04	2.64E-04	4.06E-04	8.79E-04	2.30E-03	4.03E-03	3.71E-03	3.30E-03	3.05E-03	3.00E-03	2.71E-03	2.97E-03	3.31E-03	3.59E-03	4.02E-03	4.40E-03	4.06E-03	2.92E-03	2.20E-03	2.04E-03	1.67E-03
	Emission in each Box of 1st jet	g/s	2.16E-04	1.68E-04	1.14E-04	8.72E-05	7.54E-05	1.16E-04	2.51E-04	6.58E-04	1.15E-03	1.06E-03	9.43E-04	8.72E-04	8.56E-04	7.74E-04	8.49E-04	9.46E-04	1.03E-03	1.15E-03	1.26E-03	1.16E-03	8.36E-04	6.27E-04	5.82E-04	4.76E-04
	Emission in each Box of 2nd jet	g/s	3.78E-04	2.94E-04	1.99E-04	1.53E-04	1.32E-04	2.03E-04	4.40E-04	1.15E-03	2.02E-03	1.86E-03	1.65E-03	1.53E-03	1.50E-03	1.35E-03	1.49E-03	1.66E-03	1.80E-03	2.01E-03	2.20E-03	2.03E-03	1.46E-03	1.10E-03	1.02E-03	8.34E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2272	0.1887	0.1912	0.1992	0.2063	0.3929	0.4160	0.3635	0.3641	0.3480	0.3376	0.3343	0.3056	0.2947	0.3007	0.3247	0.3318	0.3448	0.3567	0.3373	0.3007	0.2855	0.2850	0.2624
	NO2	g/vehicle/km	0.0413	0.0396	0.0393	0.0401	0.0412	0.0509	0.0517	0.0559	0.0661	0.0633	0.0607	0.0593	0.0605	0.0577	0.0596	0.0639	0.0656	0.0685	0.0715	0.0683	0.0597	0.0546	0.0542	0.0504
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0118***	***0.0080***	***0.0056***	***0.0043***	***0.0037***	***0.0089***	***0.0200***	***0.0425***	***0.0631***	***0.0585***	***0.0520***	***0.0493***	***0.0434***	***0.0391***	***0.0424***	***0.0481***	***0.0514***	***0.0576***	***0.0630***	***0.0571***	***0.0418***	***0.0326***	***0.0304***	***0.0247***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.89E-03	5.33E-03	3.71E-03	2.86E-03	2.49E-03	5.91E-03	1.34E-02	2.83E-02	4.21E-02	3.90E-02	3.47E-02	3.29E-02	2.90E-02	2.61E-02	2.83E-02	3.21E-02	3.43E-02	3.84E-02	4.20E-02	3.81E-02	2.79E-02	2.17E-02	2.02E-02	1.64E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.95E-03	2.67E-03	1.85E-03	1.43E-03	1.24E-03	2.96E-03	6.68E-03	1.42E-02	2.10E-02	1.95E-02	1.73E-02	1.64E-02	1.45E-02	1.30E-02	1.41E-02	1.60E-02	1.71E-02	1.92E-02	2.10E-02	1.90E-02	1.39E-02	1.09E-02	1.01E-02	8.22E-03
	Emission in each Box of 1st jet	g/s	1.13E-03	7.62E-04	5.29E-04	4.08E-04	3.56E-04	8.45E-04	1.91E-03	4.05E-03	6.01E-03	5.57E-03	4.95E-03	4.70E-03	4.14E-03	3.73E-03	4.04E-03	4.58E-03	4.90E-03	5.48E-03	6.00E-03	5.44E-03	3.98E-03	3.10E-03	2.89E-03	2.35E-03
	Emission in each Box of 2nd jet	g/s	1.97E-03	1.33E-03	9.26E-04	7.14E-04	6.22E-04	1.48E-03	3.34E-03	7.08E-03	1.05E-02	9.75E-03	8.67E-03	8.22E-03	7.24E-03	6.52E-03	7.07E-03	8.02E-03	8.57E-03	9.60E-03	1.05E-02	9.52E-03	6.96E-03	5.43E-03	5.06E-03	4.11E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0011***	***0.0009***	***0.0007***	***0.0011***	***0.0025***	***0.0065***	***0.0115***	***0.0106***	***0.0094***	***0.0088***	***0.0086***	***0.0077***	***0.0084***	***0.0095***	***0.0102***	***0.0114***	***0.0126***	***0.0116***	***0.0083***	***0.0062***	***0.0058***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.44E-03	1.12E-03	7.61E-04	5.75E-04	4.97E-04	7.66E-04	1.66E-03	4.36E-03	7.64E-03	7.09E-03	6.24E-03	5.84E-03	5.73E-03	5.11E-03	5.61E-03	6.31E-03	6.78E-03	7.63E-03	8.41E-03	7.71E-03	5.53E-03	4.15E-03	3.85E-03	3.16E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.18E-04	5.59E-04	3.80E-04	2.88E-04	2.49E-04	3.83E-04	8.31E-04	2.18E-03	3.82E-03	3.55E-03	3.12E-03	2.92E-03	2.87E-03	2.55E-03	2.80E-03	3.16E-03	3.39E-03	3.81E-03	4.21E-03	3.86E-03	2.76E-03	2.08E-03	1.92E-03	1.58E-03
	Emission in each Box of 1st jet	g/s	2.05E-04	1.60E-04	1.09E-04	8.22E-05	7.11E-05	1.09E-04	2.37E-04	6.23E-04	1.09E-03	1.01E-03	8.91E-04	8.34E-04	8.19E-04	7.29E-04	8.01E-04	9.02E-04	9.69E-04	1.09E-03	1.20E-03	1.10E-03	7.90E-04	5.93E-04	5.50E-04	4.51E-04
	Emission in each Box of 2nd jet	g/s	3.59E-04	2.80E-04	1.90E-04	1.44E-04	1.24E-04	1.91E-04	4.15E-04	1.09E-03	1.91E-03	1.77E-03	1.56E-03	1.46E-03	1.43E-03	1.28E-03	1.40E-03	1.58E-03	1.70E-03	1.91E-03	2.10E-03	1.93E-03	1.38E-03	1.04E-03	9.62E-04	7.90E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2136	0.1771	0.1787	0.1907	0.1975	0.3780	0.4004	0.3465	0.3472	0.3319	0.3215	0.3179	0.2906	0.2849	0.2907	0.3086	0.3218	0.3284	0.3398	0.3198	0.2856	0.2755	0.2739	0.2511
	NO2	g/vehicle/km	0.0391	0.0374	0.0370	0.0386	0.0397	0.0491	0.0499	0.0534	0.0632	0.0605	0.0580	0.0566	0.0577	0.0558	0.0578	0.0609	0.0637	0.0654	0.0683	0.0649	0.0569	0.0528	0.0522	0.0484
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0111***	***0.0075***	***0.0052***	***0.0041***	***0.0036***	***0.0085***	***0.0193***	***0.0405***	***0.0602***	***0.0558***	***0.0495***	***0.0469***	***0.0413***	***0.0378***	***0.0410***	***0.0457***	***0.0499***	***0.0548***	***0.0600***	***0.0542***	***0.0397***	***0.0314***	***0.0292***	***0.0236***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.42E-03	5.00E-03	3.46E-03	2.73E-03	2.38E-03	5.69E-03	1.29E-02	2.70E-02	4.01E-02	3.72E-02	3.30E-02	3.13E-02	2.75E-02	2.52E-02	2.73E-02	3.05E-02	3.33E-02	3.66E-02	4.00E-02	3.61E-02	2.65E-02	2.09E-02	1.94E-02	1.57E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.71E-03	2.50E-03	1.73E-03	1.37E-03	1.19E-03	2.84E-03	6.43E-03	1.35E-02	2.01E-02	1.86E-02	1.65E-02	1.56E-02	1.38E-02	1.26E-02	1.37E-02	1.52E-02	1.66E-02	1.83E-02	2.00E-02	1.81E-02	1.32E-02	1.05E-02	9.72E-03	7.87E-03
	Emission in each Box of 1st jet	g/s	1.06E-03	7.15E-04	4.95E-04	3.90E-04	3.40E-04	8.13E-04	1.84E-03	3.86E-03	5.73E-03	5.31E-03	4.72E-03	4.47E-03	3.93E-03	3.60E-03	3.90E-03	4.36E-03	4.75E-03	5.22E-03	5.71E-03	5.16E-03	3.78E-03	2.99E-03	2.78E-03	2.25E-03
	Emission in each Box of 2nd jet	g/s	1.85E-03	1.25E-03	8.66E-04	6.83E-04	5.96E-04	1.42E-03	3.21E-03	6.75E-03	1.00E-02	9.30E-03	8.26E-03	7.82E-03	6.88E-03	6.31E-03	6.83E-03	7.62E-03	8.32E-03	9.14E-03	1.00E-02	9.03E-03	6.61E-03	5.24E-03	4.86E-03	3.93E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0024***	***0.0062***	***0.0110***	***0.0102***	***0.0089***	***0.0083***	***0.0082***	***0.0074***	***0.0081***	***0.0090***	***0.0099***	***0.0109***	***0.0120***	***0.0110***	***0.0079***	***0.0060***	***0.0056***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.36E-03	1.06E-03	7.16E-04	5.53E-04	4.79E-04	7.39E-04	1.60E-03	4.16E-03	7.30E-03	6.78E-03	5.96E-03	5.57E-03	5.47E-03	4.94E-03	5.43E-03	6.02E-03	6.59E-03	7.28E-03	8.03E-03	7.33E-03	5.27E-03	4.01E-03	3.70E-03	3.03E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.78E-04	5.29E-04	3.58E-04	2.77E-04	2.39E-04	3.69E-04	8.02E-04	2.08E-03	3.65E-03	3.39E-03	2.98E-03	2.78E-03	2.73E-03	2.47E-03	2.71E-03	3.01E-03	3.29E-03	3.64E-03	4.02E-03	3.67E-03	2.64E-03	2.01E-03	1.85E-03	1.52E-03
	Emission in each Box of 1st jet	g/s	1.94E-04	1.51E-04	1.02E-04	7.91E-05	6.84E-05	1.06E-04	2.29E-04	5.95E-04	1.04E-03	9.68E-04	8.51E-04	7.95E-04	7.81E-04	7.06E-04	7.76E-04	8.59E-04	9.41E-04	1.04E-03	1.15E-03	1.05E-03	7.53E-04	5.73E-04	5.29E-04	4.33E-04
	Emission in each Box of 2nd jet	g/s	3.39E-04	2.64E-04	1.79E-04	1.38E-04	1.20E-04	1.85E-04	4.01E-04	1.04E-03	1.83E-03	1.69E-03	1.49E-03	1.39E-03	1.37E-03	1.24E-03	1.36E-03	1.50E-03	1.65E-03	1.82E-03	2.01E-03	1.83E-03	1.32E-03	1.00E-03	9.26E-04	7.58E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1922	0.1582	0.1601	0.1664	0.1724	0.3303	0.3457	0.3014	0.3060	0.2910	0.2867	0.2828	0.2604	0.2541	0.2611	0.2759	0.2869	0.2971	0.2999	0.2875	0.2562	0.2403	0.2408	0.2203
	NO2	g/vehicle/km	0.0354	0.0337	0.0334	0.0341	0.0350	0.0432	0.0434	0.0468	0.0560	0.0533	0.0519	0.0506	0.0519	0.0500	0.0521	0.0547	0.0571	0.0594	0.0606	0.0586	0.0512	0.0464	0.0461	0.0427
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0100***	***0.0067***	***0.0047***	***0.0036***	***0.0031***	***0.0075***	***0.0167***	***0.0352***	***0.0531***	***0.0489***	***0.0442***	***0.0418***	***0.0370***	***0.0338***	***0.0368***	***0.0409***	***0.0445***	***0.0496***	***0.0529***	***0.0487***	***0.0356***	***0.0274***	***0.0256***	***0.0207***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.67E-03	4.47E-03	3.10E-03	2.39E-03	2.08E-03	4.97E-03	1.11E-02	2.35E-02	3.54E-02	3.26E-02	2.95E-02	2.78E-02	2.47E-02	2.25E-02	2.45E-02	2.73E-02	2.97E-02	3.31E-02	3.53E-02	3.25E-02	2.37E-02	1.83E-02	1.71E-02	1.38E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.34E-03	2.23E-03	1.55E-03	1.19E-03	1.04E-03	2.49E-03	5.55E-03	1.17E-02	1.77E-02	1.63E-02	1.47E-02	1.39E-02	1.23E-02	1.13E-02	1.23E-02	1.36E-02	1.48E-02	1.65E-02	1.76E-02	1.62E-02	1.19E-02	9.13E-03	8.55E-03	6.90E-03
	Emission in each Box of 1st jet	g/s	9.53E-04	6.38E-04	4.43E-04	3.41E-04	2.97E-04	7.10E-04	1.59E-03	3.36E-03	5.05E-03	4.66E-03	4.21E-03	3.98E-03	3.52E-03	3.21E-03	3.51E-03	3.89E-03	4.24E-03	4.72E-03	5.04E-03	4.64E-03	3.39E-03	2.61E-03	2.44E-03	1.97E-03
	Emission in each Box of 2nd jet	g/s	1.67E-03	1.12E-03	7.76E-04	5.96E-04	5.20E-04	1.24E-03	2.78E-03	5.87E-03	8.84E-03	8.15E-03	7.36E-03	6.96E-03	6.17E-03	5.63E-03	6.14E-03	6.82E-03	7.41E-03	8.27E-03	8.82E-03	8.11E-03	5.93E-03	4.57E-03	4.27E-03	3.45E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0010***	***0.0021***	***0.0055***	***0.0097***	***0.0090***	***0.0080***	***0.0075***	***0.0074***	***0.0066***	***0.0073***	***0.0081***	***0.0088***	***0.0099***	***0.0107***	***0.0099***	***0.0071***	***0.0053***	***0.0049***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.23E-03	9.52E-04	6.48E-04	4.88E-04	4.22E-04	6.50E-04	1.39E-03	3.65E-03	6.47E-03	5.97E-03	5.33E-03	4.98E-03	4.92E-03	4.43E-03	4.89E-03	5.40E-03	5.90E-03	6.61E-03	7.13E-03	6.62E-03	4.75E-03	3.52E-03	3.28E-03	2.68E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.14E-04	4.76E-04	3.24E-04	2.44E-04	2.11E-04	3.25E-04	6.97E-04	1.82E-03	3.23E-03	2.99E-03	2.67E-03	2.49E-03	2.46E-03	2.22E-03	2.45E-03	2.70E-03	2.95E-03	3.31E-03	3.56E-03	3.31E-03	2.37E-03	1.76E-03	1.64E-03	1.34E-03
	Emission in each Box of 1st jet	g/s	1.75E-04	1.36E-04	9.25E-05	6.97E-05	6.03E-05	9.28E-05	1.99E-04	5.21E-04	9.24E-04	8.53E-04	7.62E-04	7.11E-04	7.03E-04	6.33E-04	6.99E-04	7.72E-04	8.43E-04	9.45E-04	1.02E-03	9.45E-04	6.78E-04	5.04E-04	4.68E-04	3.83E-04
	Emission in each Box of 2nd jet	g/s	3.07E-04	2.38E-04	1.62E-04	1.22E-04	1.06E-04	1.62E-04	3.48E-04	9.11E-04	1.62E-03	1.49E-03	1.33E-03	1.24E-03	1.23E-03	1.11E-03	1.22E-03	1.35E-03	1.47E-03	1.65E-03	1.78E-03	1.65E-03	1.19E-03	8.81E-04	8.19E-04	6.69E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1856	0.1535	0.1593	0.1655	0.1705	0.3267	0.3377	0.2978	0.2995	0.2905	0.2778	0.2740	0.2506	0.2462	0.2495	0.2674	0.2823	0.2901	0.2946	0.2843	0.2532	0.2390	0.2380	0.2190
	NO2	g/vehicle/km	0.0342	0.0327	0.0332	0.0339	0.0346	0.0427	0.0424	0.0463	0.0549	0.0533	0.0504	0.0490	0.0501	0.0485	0.0499	0.0531	0.0562	0.0581	0.0595	0.0580	0.0507	0.0461	0.0457	0.0425
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0097***	***0.0065***	***0.0046***	***0.0036***	***0.0031***	***0.0074***	***0.0163***	***0.0348***	***0.0519***	***0.0488***	***0.0428***	***0.0404***	***0.0356***	***0.0327***	***0.0352***	***0.0396***	***0.0438***	***0.0484***	***0.0520***	***0.0481***	***0.0352***	***0.0272***	***0.0253***	***0.0206***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.44E-03	4.34E-03	3.09E-03	2.37E-03	2.06E-03	4.92E-03	1.08E-02	2.32E-02	3.46E-02	3.26E-02	2.85E-02	2.70E-02	2.37E-02	2.18E-02	2.35E-02	2.64E-02	2.92E-02	3.23E-02	3.47E-02	3.21E-02	2.35E-02	1.82E-02	1.69E-02	1.37E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.22E-03	2.17E-03	1.54E-03	1.19E-03	1.03E-03	2.46E-03	5.42E-03	1.16E-02	1.73E-02	1.63E-02	1.43E-02	1.35E-02	1.19E-02	1.09E-02	1.17E-02	1.32E-02	1.46E-02	1.61E-02	1.73E-02	1.60E-02	1.17E-02	9.08E-03	8.45E-03	6.86E-03
	Emission in each Box of 1st jet	g/s	9.21E-04	6.20E-04	4.41E-04	3.39E-04	2.94E-04	7.03E-04	1.55E-03	3.32E-03	4.94E-03	4.65E-03	4.08E-03	3.85E-03	3.39E-03	3.11E-03	3.35E-03	3.77E-03	4.17E-03	4.61E-03	4.95E-03	4.59E-03	3.35E-03	2.59E-03	2.41E-03	1.96E-03
	Emission in each Box of 2nd jet	g/s	1.61E-03	1.08E-03	7.72E-04	5.93E-04	5.14E-04	1.23E-03	2.71E-03	5.80E-03	8.65E-03	8.14E-03	7.14E-03	6.74E-03	5.94E-03	5.45E-03	5.86E-03	6.60E-03	7.30E-03	8.07E-03	8.66E-03	8.02E-03	5.87E-03	4.54E-03	4.22E-03	3.43E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0010***	***0.0020***	***0.0054***	***0.0095***	***0.0090***	***0.0078***	***0.0072***	***0.0071***	***0.0064***	***0.0070***	***0.0079***	***0.0087***	***0.0097***	***0.0105***	***0.0098***	***0.0070***	***0.0053***	***0.0049***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.19E-03	9.25E-04	6.44E-04	4.86E-04	4.18E-04	6.43E-04	1.36E-03	3.61E-03	6.34E-03	5.97E-03	5.18E-03	4.83E-03	4.74E-03	4.30E-03	4.69E-03	5.24E-03	5.81E-03	6.46E-03	7.00E-03	6.55E-03	4.70E-03	3.51E-03	3.24E-03	2.66E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.93E-04	4.62E-04	3.22E-04	2.43E-04	2.09E-04	3.22E-04	6.82E-04	1.80E-03	3.17E-03	2.98E-03	2.59E-03	2.41E-03	2.37E-03	2.15E-03	2.34E-03	2.62E-03	2.91E-03	3.23E-03	3.50E-03	3.27E-03	2.35E-03	1.75E-03	1.62E-03	1.33E-03
	Emission in each Box of 1st jet	g/s	1.70E-04	1.32E-04	9.19E-05	6.94E-05	5.97E-05	9.19E-05	1.95E-04	5.15E-04	9.06E-04	8.53E-04	7.40E-04	6.89E-04	6.78E-04	6.14E-04	6.70E-04	7.49E-04	8.31E-04	9.23E-04	1.00E-03	9.35E-04	6.71E-04	5.01E-04	4.63E-04	3.80E-04
	Emission in each Box of 2nd jet	g/s	2.97E-04	2.31E-04	1.61E-04	1.21E-04	1.04E-04	1.61E-04	3.41E-04	9.02E-04	1.59E-03	1.49E-03	1.29E-03	1.21E-03	1.19E-03	1.07E-03	1.17E-03	1.31E-03	1.45E-03	1.62E-03	1.75E-03	1.64E-03	1.17E-03	8.77E-04	8.11E-04	6.66E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1867	0.1526	0.1544	0.1603	0.1661	0.3167	0.3377	0.2905	0.2923	0.2811	0.2789	0.2771	0.2460	0.2419	0.2524	0.2686	0.2773	0.2891	0.2913	0.2811	0.2488	0.2361	0.2350	0.2136
	NO2	g/vehicle/km	0.0344	0.0326	0.0323	0.0329	0.0338	0.0415	0.0424	0.0452	0.0536	0.0515	0.0506	0.0496	0.0492	0.0477	0.0504	0.0532	0.0552	0.0578	0.0589	0.0574	0.0498	0.0456	0.0451	0.0415
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0097***	***0.0065***	***0.0045***	***0.0034***	***0.0030***	***0.0071***	***0.0163***	***0.0340***	***0.0507***	***0.0473***	***0.0430***	***0.0409***	***0.0350***	***0.0321***	***0.0356***	***0.0398***	***0.0430***	***0.0483***	***0.0514***	***0.0476***	***0.0346***	***0.0269***	***0.0250***	***0.0201***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.48E-03	4.31E-03	2.99E-03	2.30E-03	2.00E-03	4.77E-03	1.08E-02	2.26E-02	3.38E-02	3.15E-02	2.87E-02	2.73E-02	2.33E-02	2.14E-02	2.37E-02	2.65E-02	2.87E-02	3.22E-02	3.43E-02	3.17E-02	2.30E-02	1.79E-02	1.67E-02	1.34E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.24E-03	2.16E-03	1.50E-03	1.15E-03	1.00E-03	2.38E-03	5.42E-03	1.13E-02	1.69E-02	1.58E-02	1.43E-02	1.36E-02	1.17E-02	1.07E-02	1.19E-02	1.33E-02	1.43E-02	1.61E-02	1.71E-02	1.59E-02	1.15E-02	8.97E-03	8.34E-03	6.69E-03
	Emission in each Box of 1st jet	g/s	9.26E-04	6.16E-04	4.28E-04	3.28E-04	2.86E-04	6.81E-04	1.55E-03	3.23E-03	4.83E-03	4.50E-03	4.09E-03	3.90E-03	3.33E-03	3.06E-03	3.39E-03	3.79E-03	4.09E-03	4.60E-03	4.90E-03	4.53E-03	3.29E-03	2.56E-03	2.38E-03	1.91E-03
	Emission in each Box of 2nd jet	g/s	1.62E-03	1.08E-03	7.48E-04	5.75E-04	5.01E-04	1.19E-03	2.71E-03	5.66E-03	8.45E-03	7.88E-03	7.16E-03	6.82E-03	5.83E-03	5.35E-03	5.93E-03	6.63E-03	7.17E-03	8.04E-03	8.57E-03	7.93E-03	5.76E-03	4.49E-03	4.17E-03	3.35E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0009***	***0.0020***	***0.0053***	***0.0093***	***0.0087***	***0.0078***	***0.0073***	***0.0070***	***0.0063***	***0.0071***	***0.0079***	***0.0086***	***0.0097***	***0.0104***	***0.0097***	***0.0069***	***0.0052***	***0.0048***	***0.0039***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.19E-03	9.20E-04	6.26E-04	4.72E-04	4.08E-04	6.25E-04	1.36E-03	3.52E-03	6.19E-03	5.78E-03	5.20E-03	4.88E-03	4.66E-03	4.22E-03	4.74E-03	5.26E-03	5.71E-03	6.44E-03	6.93E-03	6.48E-03	4.62E-03	3.47E-03	3.20E-03	2.60E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.97E-04	4.60E-04	3.13E-04	2.36E-04	2.04E-04	3.12E-04	6.82E-04	1.76E-03	3.10E-03	2.89E-03	2.60E-03	2.44E-03	2.33E-03	2.11E-03	2.37E-03	2.63E-03	2.85E-03	3.22E-03	3.47E-03	3.24E-03	2.31E-03	1.73E-03	1.60E-03	1.30E-03
	Emission in each Box of 1st jet	g/s	1.70E-04	1.31E-04	8.94E-05	6.74E-05	5.83E-05	8.92E-05	1.95E-04	5.03E-04	8.84E-04	8.25E-04	7.43E-04	6.97E-04	6.65E-04	6.03E-04	6.76E-04	7.51E-04	8.16E-04	9.20E-04	9.90E-04	9.25E-04	6.59E-04	4.95E-04	4.58E-04	3.72E-04
	Emission in each Box of 2nd jet	g/s	2.98E-04	2.30E-04	1.56E-04	1.18E-04	1.02E-04	1.56E-04	3.41E-04	8.80E-04	1.55E-03	1.44E-03	1.30E-03	1.22E-03	1.16E-03	1.06E-03	1.18E-03	1.31E-03	1.43E-03	1.61E-03	1.73E-03	1.62E-03	1.15E-03	8.67E-04	8.01E-04	6.50E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1891	0.1556	0.1575	0.1636	0.1695	0.3233	0.3444	0.2978	0.2958	0.2820	0.2833	0.2776	0.2506	0.2462	0.2512	0.2674	0.2840	0.2883	0.2997	0.2810	0.2489	0.2362	0.2352	0.2165
	NO2	g/vehicle/km	0.0348	0.0332	0.0329	0.0335	0.0345	0.0423	0.0432	0.0463	0.0542	0.0517	0.0514	0.0496	0.0501	0.0485	0.0502	0.0531	0.0566	0.0577	0.0605	0.0574	0.0499	0.0456	0.0452	0.0420
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0099***	***0.0066***	***0.0046***	***0.0035***	***0.0031***	***0.0073***	***0.0166***	***0.0348***	***0.0513***	***0.0474***	***0.0437***	***0.0410***	***0.0356***	***0.0327***	***0.0354***	***0.0396***	***0.0440***	***0.0481***	***0.0529***	***0.0476***	***0.0346***	***0.0269***	***0.0250***	***0.0203***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.57E-03	4.40E-03	3.05E-03	2.35E-03	2.05E-03	4.86E-03	1.11E-02	2.32E-02	3.42E-02	3.16E-02	2.91E-02	2.73E-02	2.37E-02	2.18E-02	2.36E-02	2.64E-02	2.94E-02	3.21E-02	3.53E-02	3.17E-02	2.31E-02	1.80E-02	1.67E-02	1.36E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.28E-03	2.20E-03	1.53E-03	1.17E-03	1.02E-03	2.43E-03	5.53E-03	1.16E-02	1.71E-02	1.58E-02	1.46E-02	1.37E-02	1.19E-02	1.09E-02	1.18E-02	1.32E-02	1.47E-02	1.60E-02	1.76E-02	1.59E-02	1.15E-02	8.98E-03	8.35E-03	6.78E-03
	Emission in each Box of 1st jet	g/s	9.38E-04	6.28E-04	4.36E-04	3.35E-04	2.92E-04	6.95E-04	1.58E-03	3.32E-03	4.88E-03	4.52E-03	4.16E-03	3.90E-03	3.39E-03	3.11E-03	3.37E-03	3.77E-03	4.19E-03	4.58E-03	5.04E-03	4.53E-03	3.29E-03	2.56E-03	2.39E-03	1.94E-03
	Emission in each Box of 2nd jet	g/s	1.64E-03	1.10E-03	7.63E-04	5.86E-04	5.11E-04	1.22E-03	2.77E-03	5.80E-03	8.55E-03	7.90E-03	7.28E-03	6.83E-03	5.94E-03	5.45E-03	5.90E-03	6.60E-03	7.34E-03	8.02E-03	8.82E-03	7.93E-03	5.77E-03	4.49E-03	4.17E-03	3.39E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0010***	***0.0021***	***0.0054***	***0.0094***	***0.0087***	***0.0079***	***0.0073***	***0.0071***	***0.0064***	***0.0071***	***0.0079***	***0.0088***	***0.0096***	***0.0107***	***0.0097***	***0.0069***	***0.0052***	***0.0048***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.21E-03	9.37E-04	6.37E-04	4.81E-04	4.16E-04	6.37E-04	1.39E-03	3.61E-03	6.26E-03	5.80E-03	5.28E-03	4.89E-03	4.74E-03	4.30E-03	4.72E-03	5.24E-03	5.85E-03	6.43E-03	7.12E-03	6.48E-03	4.62E-03	3.47E-03	3.21E-03	2.63E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.04E-04	4.68E-04	3.19E-04	2.40E-04	2.08E-04	3.18E-04	6.94E-04	1.80E-03	3.13E-03	2.90E-03	2.64E-03	2.44E-03	2.37E-03	2.15E-03	2.36E-03	2.62E-03	2.92E-03	3.21E-03	3.56E-03	3.24E-03	2.31E-03	1.73E-03	1.60E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	1.73E-04	1.34E-04	9.10E-05	6.87E-05	5.94E-05	9.09E-05	1.98E-04	5.15E-04	8.95E-04	8.28E-04	7.54E-04	6.98E-04	6.78E-04	6.14E-04	6.74E-04	7.49E-04	8.35E-04	9.18E-04	1.02E-03	9.25E-04	6.60E-04	4.96E-04	4.58E-04	3.76E-04
	Emission in each Box of 2nd jet	g/s	3.02E-04	2.34E-04	1.59E-04	1.20E-04	1.04E-04	1.59E-04	3.47E-04	9.02E-04	1.57E-03	1.45E-03	1.32E-03	1.22E-03	1.19E-03	1.07E-03	1.18E-03	1.31E-03	1.46E-03	1.61E-03	1.78E-03	1.62E-03	1.15E-03	8.67E-04	8.02E-04	6.58E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1878	0.1544	0.1563	0.1613	0.1724	0.3285	0.3482	0.2941	0.2982	0.2850	0.2867	0.2771	0.2534	0.2525	0.2558	0.2741	0.2811	0.2872	0.2982	0.2777	0.2562	0.2417	0.2408	0.2216
	NO2	g/vehicle/km	0.0345	0.0329	0.0326	0.0331	0.0350	0.0430	0.0437	0.0457	0.0546	0.0523	0.0519	0.0496	0.0506	0.0497	0.0511	0.0543	0.0559	0.0575	0.0602	0.0567	0.0512	0.0466	0.0461	0.0430
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0098***	***0.0065***	***0.0045***	***0.0035***	***0.0031***	***0.0074***	***0.0168***	***0.0344***	***0.0517***	***0.0479***	***0.0442***	***0.0409***	***0.0360***	***0.0335***	***0.0361***	***0.0406***	***0.0436***	***0.0479***	***0.0526***	***0.0470***	***0.0356***	***0.0276***	***0.0256***	***0.0208***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.52E-03	4.36E-03	3.03E-03	2.31E-03	2.08E-03	4.94E-03	1.12E-02	2.29E-02	3.45E-02	3.19E-02	2.95E-02	2.73E-02	2.40E-02	2.24E-02	2.40E-02	2.71E-02	2.91E-02	3.20E-02	3.51E-02	3.14E-02	2.37E-02	1.84E-02	1.71E-02	1.39E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.26E-03	2.18E-03	1.51E-03	1.16E-03	1.04E-03	2.47E-03	5.59E-03	1.15E-02	1.72E-02	1.60E-02	1.47E-02	1.36E-02	1.20E-02	1.12E-02	1.20E-02	1.35E-02	1.45E-02	1.60E-02	1.75E-02	1.57E-02	1.19E-02	9.19E-03	8.55E-03	6.94E-03
	Emission in each Box of 1st jet	g/s	9.32E-04	6.23E-04	4.33E-04	3.30E-04	2.97E-04	7.06E-04	1.60E-03	3.27E-03	4.92E-03	4.56E-03	4.21E-03	3.90E-03	3.43E-03	3.19E-03	3.44E-03	3.87E-03	4.15E-03	4.57E-03	5.01E-03	4.48E-03	3.39E-03	2.62E-03	2.44E-03	1.98E-03
	Emission in each Box of 2nd jet	g/s	1.63E-03	1.09E-03	7.57E-04	5.78E-04	5.20E-04	1.24E-03	2.80E-03	5.73E-03	8.61E-03	7.99E-03	7.36E-03	6.82E-03	6.00E-03	5.59E-03	6.01E-03	6.77E-03	7.27E-03	7.99E-03	8.77E-03	7.84E-03	5.93E-03	4.59E-03	4.27E-03	3.47E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0010***	***0.0021***	***0.0053***	***0.0095***	***0.0088***	***0.0080***	***0.0073***	***0.0072***	***0.0066***	***0.0072***	***0.0081***	***0.0087***	***0.0096***	***0.0106***	***0.0096***	***0.0071***	***0.0053***	***0.0049***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.20E-03	9.30E-04	6.32E-04	4.74E-04	4.22E-04	6.47E-04	1.40E-03	3.56E-03	6.31E-03	5.86E-03	5.33E-03	4.88E-03	4.79E-03	4.40E-03	4.80E-03	5.37E-03	5.78E-03	6.40E-03	7.09E-03	6.40E-03	4.75E-03	3.54E-03	3.28E-03	2.69E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.00E-04	4.65E-04	3.16E-04	2.37E-04	2.11E-04	3.23E-04	7.02E-04	1.78E-03	3.16E-03	2.93E-03	2.67E-03	2.44E-03	2.40E-03	2.20E-03	2.40E-03	2.68E-03	2.89E-03	3.20E-03	3.54E-03	3.20E-03	2.37E-03	1.77E-03	1.64E-03	1.35E-03
	Emission in each Box of 1st jet	g/s	1.71E-04	1.33E-04	9.03E-05	6.78E-05	6.03E-05	9.24E-05	2.00E-04	5.09E-04	9.02E-04	8.37E-04	7.62E-04	6.97E-04	6.85E-04	6.29E-04	6.86E-04	7.67E-04	8.26E-04	9.14E-04	1.01E-03	9.14E-04	6.78E-04	5.06E-04	4.68E-04	3.85E-04
	Emission in each Box of 2nd jet	g/s	3.00E-04	2.32E-04	1.58E-04	1.19E-04	1.06E-04	1.62E-04	3.51E-04	8.91E-04	1.58E-03	1.47E-03	1.33E-03	1.22E-03	1.20E-03	1.10E-03	1.20E-03	1.34E-03	1.45E-03	1.60E-03	1.77E-03	1.60E-03	1.19E-03	8.86E-04	8.19E-04	6.73E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2116	0.1755	0.1769	0.1842	0.1900	0.3629	0.3860	0.3371	0.3376	0.3226	0.3121	0.3088	0.2838	0.2770	0.2826	0.3012	0.3129	0.3190	0.3332	0.3148	0.2822	0.2679	0.2672	0.2448
	NO2	g/vehicle/km	0.0387	0.0371	0.0366	0.0374	0.0383	0.0472	0.0482	0.0521	0.0615	0.0589	0.0564	0.0550	0.0564	0.0543	0.0562	0.0595	0.0621	0.0636	0.0670	0.0639	0.0562	0.0514	0.0510	0.0473
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0110***	***0.0074***	***0.0051***	***0.0040***	***0.0034***	***0.0082***	***0.0186***	***0.0394***	***0.0585***	***0.0542***	***0.0481***	***0.0456***	***0.0403***	***0.0368***	***0.0399***	***0.0446***	***0.0485***	***0.0533***	***0.0588***	***0.0533***	***0.0392***	***0.0305***	***0.0285***	***0.0230***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.35E-03	4.96E-03	3.43E-03	2.64E-03	2.29E-03	5.46E-03	1.24E-02	2.63E-02	3.90E-02	3.62E-02	3.21E-02	3.04E-02	2.69E-02	2.45E-02	2.66E-02	2.98E-02	3.23E-02	3.55E-02	3.92E-02	3.55E-02	2.61E-02	2.04E-02	1.90E-02	1.53E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.67E-03	2.48E-03	1.71E-03	1.32E-03	1.15E-03	2.73E-03	6.20E-03	1.31E-02	1.95E-02	1.81E-02	1.60E-02	1.52E-02	1.34E-02	1.23E-02	1.33E-02	1.49E-02	1.62E-02	1.78E-02	1.96E-02	1.78E-02	1.31E-02	1.02E-02	9.48E-03	7.67E-03
	Emission in each Box of 1st jet	g/s	1.05E-03	7.08E-04	4.90E-04	3.77E-04	3.27E-04	7.80E-04	1.77E-03	3.75E-03	5.57E-03	5.17E-03	4.58E-03	4.34E-03	3.84E-03	3.50E-03	3.80E-03	4.25E-03	4.62E-03	5.07E-03	5.60E-03	5.08E-03	3.74E-03	2.91E-03	2.71E-03	2.19E-03
	Emission in each Box of 2nd jet	g/s	1.84E-03	1.24E-03	8.57E-04	6.60E-04	5.73E-04	1.37E-03	3.10E-03	6.57E-03	9.75E-03	9.04E-03	8.02E-03	7.60E-03	6.72E-03	6.13E-03	6.64E-03	7.44E-03	8.09E-03	8.88E-03	9.80E-03	8.89E-03	6.54E-03	5.09E-03	4.74E-03	3.83E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0023***	***0.0061***	***0.0107***	***0.0099***	***0.0087***	***0.0081***	***0.0080***	***0.0072***	***0.0079***	***0.0088***	***0.0096***	***0.0106***	***0.0118***	***0.0108***	***0.0078***	***0.0059***	***0.0054***	***0.0044***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.34E-03	1.05E-03	7.09E-04	5.36E-04	4.62E-04	7.11E-04	1.55E-03	4.06E-03	7.11E-03	6.60E-03	5.79E-03	5.42E-03	5.34E-03	4.81E-03	5.28E-03	5.88E-03	6.42E-03	7.08E-03	7.89E-03	7.22E-03	5.21E-03	3.91E-03	3.62E-03	2.96E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.72E-04	5.23E-04	3.55E-04	2.68E-04	2.31E-04	3.55E-04	7.74E-04	2.03E-03	3.56E-03	3.30E-03	2.90E-03	2.71E-03	2.67E-03	2.40E-03	2.64E-03	2.94E-03	3.21E-03	3.54E-03	3.94E-03	3.61E-03	2.60E-03	1.95E-03	1.81E-03	1.48E-03
	Emission in each Box of 1st jet	g/s	1.92E-04	1.50E-04	1.01E-04	7.66E-05	6.59E-05	1.02E-04	2.21E-04	5.80E-04	1.02E-03	9.43E-04	8.27E-04	7.74E-04	7.63E-04	6.87E-04	7.54E-04	8.40E-04	9.16E-04	1.01E-03	1.13E-03	1.03E-03	7.44E-04	5.58E-04	5.17E-04	4.23E-04
	Emission in each Box of 2nd jet	g/s	3.36E-04	2.62E-04	1.77E-04	1.34E-04	1.15E-04	1.78E-04	3.87E-04	1.01E-03	1.78E-03	1.65E-03	1.45E-03	1.35E-03	1.34E-03	1.20E-03	1.32E-03	1.47E-03	1.60E-03	1.77E-03	1.97E-03	1.80E-03	1.30E-03	9.77E-04	9.05E-04	7.40E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2319	0.1948	0.1968	0.2069	0.2143	0.4087	0.4339	0.3779	0.3798	0.3640	0.3522	0.3464	0.3139	0.3065	0.3126	0.3335	0.3446	0.3573	0.3660	0.3508	0.3128	0.2971	0.2965	0.2730
	NO2	g/vehicle/km	0.0422	0.0408	0.0404	0.0416	0.0427	0.0529	0.0539	0.0581	0.0688	0.0660	0.0633	0.0614	0.0621	0.0599	0.0619	0.0656	0.0681	0.0709	0.0733	0.0709	0.0620	0.0567	0.0563	0.0524
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0121***	***0.0083***	***0.0057***	***0.0044***	***0.0039***	***0.0092***	***0.0209***	***0.0442***	***0.0658***	***0.0612***	***0.0543***	***0.0511***	***0.0446***	***0.0407***	***0.0441***	***0.0494***	***0.0534***	***0.0597***	***0.0646***	***0.0594***	***0.0435***	***0.0339***	***0.0316***	***0.0256***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.05E-03	5.50E-03	3.81E-03	2.97E-03	2.59E-03	6.15E-03	1.39E-02	2.95E-02	4.39E-02	4.08E-02	3.62E-02	3.41E-02	2.97E-02	2.71E-02	2.94E-02	3.29E-02	3.56E-02	3.98E-02	4.31E-02	3.96E-02	2.90E-02	2.26E-02	2.11E-02	1.71E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.03E-03	2.75E-03	1.91E-03	1.48E-03	1.29E-03	3.08E-03	6.97E-03	1.47E-02	2.19E-02	2.04E-02	1.81E-02	1.70E-02	1.49E-02	1.36E-02	1.47E-02	1.65E-02	1.78E-02	1.99E-02	2.15E-02	1.98E-02	1.45E-02	1.13E-02	1.05E-02	8.55E-03
	Emission in each Box of 1st jet	g/s	1.15E-03	7.86E-04	5.45E-04	4.24E-04	3.69E-04	8.79E-04	1.99E-03	4.21E-03	6.27E-03	5.83E-03	5.17E-03	4.87E-03	4.25E-03	3.88E-03	4.20E-03	4.71E-03	5.09E-03	5.68E-03	6.15E-03	5.66E-03	4.14E-03	3.23E-03	3.01E-03	2.44E-03
	Emission in each Box of 2nd jet	g/s	2.01E-03	1.38E-03	9.53E-04	7.42E-04	6.46E-04	1.54E-03	3.48E-03	7.36E-03	1.10E-02	1.02E-02	9.05E-03	8.52E-03	7.44E-03	6.78E-03	7.35E-03	8.24E-03	8.91E-03	9.94E-03	1.08E-02	9.90E-03	7.24E-03	5.64E-03	5.26E-03	4.27E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0026***	***0.0068***	***0.0119***	***0.0111***	***0.0097***	***0.0091***	***0.0088***	***0.0080***	***0.0087***	***0.0097***	***0.0106***	***0.0118***	***0.0129***	***0.0120***	***0.0086***	***0.0065***	***0.0060***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.46E-03	1.15E-03	7.82E-04	5.97E-04	5.16E-04	7.96E-04	1.73E-03	4.53E-03	7.95E-03	7.40E-03	6.50E-03	6.04E-03	5.89E-03	5.30E-03	5.82E-03	6.48E-03	7.03E-03	7.89E-03	8.62E-03	8.00E-03	5.74E-03	4.31E-03	3.99E-03	3.28E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.32E-04	5.77E-04	3.91E-04	2.98E-04	2.58E-04	3.98E-04	8.65E-04	2.26E-03	3.97E-03	3.70E-03	3.25E-03	3.02E-03	2.94E-03	2.65E-03	2.91E-03	3.24E-03	3.52E-03	3.95E-03	4.31E-03	4.00E-03	2.87E-03	2.15E-03	2.00E-03	1.64E-03
	Emission in each Box of 1st jet	g/s	2.09E-04	1.65E-04	1.12E-04	8.52E-05	7.37E-05	1.14E-04	2.47E-04	6.47E-04	1.14E-03	1.06E-03	9.28E-04	8.63E-04	8.41E-04	7.57E-04	8.31E-04	9.26E-04	1.00E-03	1.13E-03	1.23E-03	1.14E-03	8.21E-04	6.15E-04	5.71E-04	4.69E-04
	Emission in each Box of 2nd jet	g/s	3.66E-04	2.88E-04	1.96E-04	1.49E-04	1.29E-04	1.99E-04	4.33E-04	1.13E-03	1.99E-03	1.85E-03	1.62E-03	1.51E-03	1.47E-03	1.33E-03	1.46E-03	1.62E-03	1.76E-03	1.97E-03	2.16E-03	2.00E-03	1.44E-03	1.08E-03	9.99E-04	8.20E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	826	672	461	341	287	358	764	1854	2749	2666	2444	2341	2254	2106	2236	2350	2459	2648	2799	2686	2204	1808	1689	1490
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2444	0.2039	0.2062	0.2155	0.2257	0.4278	0.4527	0.3940	0.3956	0.3787	0.3656	0.3602	0.3257	0.3180	0.3253	0.3463	0.3575	0.3697	0.3824	0.3621	0.3241	0.3070	0.3103	0.2857
	NO2	g/vehicle/km	0.0442	0.0424	0.0420	0.0430	0.0447	0.0551	0.0560	0.0603	0.0714	0.0685	0.0655	0.0637	0.0643	0.0620	0.0642	0.0680	0.0704	0.0732	0.0763	0.0730	0.0640	0.0584	0.0586	0.0546
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0127***	***0.0086***	***0.0060***	***0.0046***	***0.0041***	***0.0097***	***0.0218***	***0.0461***	***0.0686***	***0.0637***	***0.0563***	***0.0532***	***0.0463***	***0.0422***	***0.0459***	***0.0513***	***0.0554***	***0.0617***	***0.0675***	***0.0613***	***0.0450***	***0.0350***	***0.0331***	***0.0268***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.49E-03	5.76E-03	4.00E-03	3.09E-03	2.72E-03	6.44E-03	1.45E-02	3.07E-02	4.57E-02	4.24E-02	3.76E-02	3.54E-02	3.09E-02	2.82E-02	3.06E-02	3.42E-02	3.70E-02	4.12E-02	4.50E-02	4.09E-02	3.00E-02	2.33E-02	2.20E-02	1.79E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.24E-03	2.88E-03	2.00E-03	1.54E-03	1.36E-03	3.22E-03	7.27E-03	1.54E-02	2.29E-02	2.12E-02	1.88E-02	1.77E-02	1.54E-02	1.41E-02	1.53E-02	1.71E-02	1.85E-02	2.06E-02	2.25E-02	2.04E-02	1.50E-02	1.17E-02	1.10E-02	8.95E-03
	Emission in each Box of 1st jet	g/s	1.21E-03	8.23E-04	5.71E-04	4.41E-04	3.89E-04	9.20E-04	2.08E-03	4.39E-03	6.53E-03	6.06E-03	5.37E-03	5.06E-03	4.41E-03	4.02E-03	4.37E-03	4.89E-03	5.28E-03	5.88E-03	6.43E-03	5.84E-03	4.29E-03	3.33E-03	3.15E-03	2.56E-03
	Emission in each Box of 2nd jet	g/s	2.12E-03	1.44E-03	9.99E-04	7.72E-04	6.81E-04	1.61E-03	3.63E-03	7.68E-03	1.14E-02	1.06E-02	9.39E-03	8.86E-03	7.71E-03	7.04E-03	7.64E-03	8.55E-03	9.24E-03	1.03E-02	1.12E-02	1.02E-02	7.51E-03	5.83E-03	5.51E-03	4.47E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0027***	***0.0070***	***0.0124***	***0.0115***	***0.0101***	***0.0094***	***0.0091***	***0.0082***	***0.0091***	***0.0101***	***0.0109***	***0.0122***	***0.0135***	***0.0124***	***0.0089***	***0.0067***	***0.0062***	***0.0051***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.53E-03	1.20E-03	8.13E-04	6.17E-04	5.39E-04	8.29E-04	1.80E-03	4.70E-03	8.25E-03	7.67E-03	6.72E-03	6.26E-03	6.09E-03	5.49E-03	6.04E-03	6.72E-03	7.28E-03	8.15E-03	8.98E-03	8.24E-03	5.93E-03	4.44E-03	4.16E-03	3.42E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.67E-04	5.99E-04	4.07E-04	3.08E-04	2.69E-04	4.15E-04	8.99E-04	2.35E-03	4.12E-03	3.84E-03	3.36E-03	3.13E-03	3.05E-03	2.74E-03	3.02E-03	3.36E-03	3.64E-03	4.07E-03	4.49E-03	4.12E-03	2.96E-03	2.22E-03	2.08E-03	1.71E-03
	Emission in each Box of 1st jet	g/s	2.19E-04	1.71E-04	1.16E-04	8.81E-05	7.70E-05	1.18E-04	2.57E-04	6.71E-04	1.18E-03	1.10E-03	9.61E-04	8.95E-04	8.70E-04	7.84E-04	8.63E-04	9.59E-04	1.04E-03	1.16E-03	1.28E-03	1.18E-03	8.47E-04	6.34E-04	5.95E-04	4.88E-04
	Emission in each Box of 2nd jet	g/s	3.84E-04	2.99E-04	2.03E-04	1.54E-04	1.35E-04	2.07E-04	4.50E-04	1.17E-03	2.06E-03	1.92E-03	1.68E-03	1.57E-03	1.52E-03	1.37E-03	1.51E-03	1.68E-03	1.82E-03	2.04E-03	2.25E-03	2.06E-03	1.48E-03	1.11E-03	1.04E-03	8.55E-04
RSP Emission Rate		g/s	***7.37E-04***	***4.80E-04***	***3.33E-04***	***2.61E-04***	***2.30E-04***	***5.89E-04***	***1.34E-03***	***2.57E-03***	***3.41E-03***	***3.20E-03***	***2.91E-03***	***2.77E-03***	***2.43E-03***	***2.25E-03***	***2.40E-03***	***2.60E-03***	***2.77E-03***	***3.05E-03***	***3.27E-03***	***3.00E-03***	***2.36E-03***	***1.91E-03***	***1.79E-03***	***1.48E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.92E-04	3.20E-04	2.22E-04	1.74E-04	1.53E-04	3.93E-04	8.93E-04	1.71E-03	2.28E-03	2.13E-03	1.94E-03	1.85E-03	1.62E-03	1.50E-03	1.60E-03	1.73E-03	1.85E-03	2.03E-03	2.18E-03	2.00E-03	1.57E-03	1.28E-03	1.19E-03	9.83E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.46E-04	1.60E-04	1.11E-04	8.69E-05	7.65E-05	1.96E-04	4.47E-04	8.56E-04	1.14E-03	1.07E-03	9.69E-04	9.23E-04	8.10E-04	7.49E-04	7.99E-04	8.66E-04	9.24E-04	1.02E-03	1.09E-03	9.99E-04	7.87E-04	6.38E-04	5.97E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	7.02E-05	4.57E-05	3.17E-05	2.48E-05	2.19E-05	5.61E-05	1.28E-04	2.45E-04	3.25E-04	3.05E-04	2.77E-04	2.64E-04	2.31E-04	2.14E-04	2.28E-04	2.47E-04	2.64E-04	2.90E-04	3.12E-04	2.85E-04	2.25E-04	1.82E-04	1.70E-04	1.40E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.00E-05	5.55E-05	4.35E-05	3.83E-05	9.82E-05	2.23E-04	4.28E-04	5.69E-04	5.33E-04	4.84E-04	4.61E-04	4.05E-04	3.74E-04	4.00E-04	4.33E-04	4.62E-04	5.08E-04	5.46E-04	4.99E-04	3.94E-04	3.19E-04	2.98E-04	2.46E-04
FSP Emission Rate		g/s	***6.78E-04***	***4.41E-04***	***3.06E-04***	***2.40E-04***	***2.11E-04***	***5.42E-04***	***1.23E-03***	***2.37E-03***	***3.13E-03***	***2.95E-03***	***2.67E-03***	***2.55E-03***	***2.23E-03***	***2.06E-03***	***2.21E-03***	***2.39E-03***	***2.55E-03***	***2.81E-03***	***3.00E-03***	***2.76E-03***	***2.17E-03***	***1.76E-03***	***1.65E-03***	***1.36E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.52E-04	2.94E-04	2.04E-04	1.60E-04	1.41E-04	3.61E-04	8.21E-04	1.58E-03	2.09E-03	1.96E-03	1.78E-03	1.70E-03	1.49E-03	1.38E-03	1.47E-03	1.59E-03	1.70E-03	1.87E-03	2.00E-03	1.84E-03	1.45E-03	1.18E-03	1.10E-03	9.07E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.26E-04	1.47E-04	1.02E-04	7.99E-05	7.04E-05	1.81E-04	4.11E-04	7.89E-04	1.04E-03	9.82E-04	8.91E-04	8.49E-04	7.45E-04	6.88E-04	7.35E-04	7.97E-04	8.49E-04	9.36E-04	1.00E-03	9.19E-04	7.24E-04	5.88E-04	5.50E-04	4.53E-04
	Emission in each Box of 1st jet	g/s	6.46E-05	4.20E-05	2.91E-05	2.28E-05	2.01E-05	5.16E-05	1.17E-04	2.25E-04	2.98E-04	2.80E-04	2.55E-04	2.42E-04	2.13E-04	1.97E-04	2.10E-04	2.28E-04	2.43E-04	2.67E-04	2.86E-04	2.63E-04	2.07E-04	1.68E-04	1.57E-04	1.30E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.36E-05	5.10E-05	4.00E-05	3.52E-05	9.03E-05	2.05E-04	3.94E-04	5.22E-04	4.91E-04	4.45E-04	4.24E-04	3.72E-04	3.44E-04	3.68E-04	3.98E-04	4.25E-04	4.68E-04	5.00E-04	4.60E-04	3.62E-04	2.94E-04	2.75E-04	2.27E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involvec	085P2
Road Located	087
Vehicle EF Adopte	085

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2571	0.2154	0.2184	0.2283	0.2366	0.4477	0.4770	0.4119	0.4156	0.3984	0.3884	0.3795	0.3468	0.3371	0.3412	0.3672	0.3794	0.3903	0.4012	0.3801	0.3406	0.3229	0.3260	0.2996
	NO2	g/vehicle/km	0.0462	0.0445	0.0441	0.0452	0.0465	0.0574	0.0587	0.0628	0.0747	0.0717	0.0692	0.0668	0.0681	0.0654	0.0672	0.0718	0.0744	0.0769	0.0797	0.0762	0.0669	0.0611	0.0612	0.0570
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0059***	***0.0041***	***0.0028***	***0.0022***	***0.0019***	***0.0044***	***0.0098***	***0.0212***	***0.0320***	***0.0297***	***0.0265***	***0.0248***	***0.0303***	***0.0276***	***0.0296***	***0.0335***	***0.0362***	***0.0401***	***0.0436***	***0.0398***	***0.0292***	***0.0226***	***0.0214***	***0.0173***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.96E-03	2.71E-03	1.89E-03	1.47E-03	1.27E-03	2.90E-03	6.55E-03	1.41E-02	2.13E-02	1.98E-02	1.77E-02	1.65E-02	2.02E-02	1.84E-02	1.97E-02	2.23E-02	2.41E-02	2.68E-02	2.91E-02	2.65E-02	1.94E-02	1.51E-02	1.42E-02	1.15E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.98E-03	1.36E-03	9.46E-04	7.35E-04	6.36E-04	1.45E-03	3.27E-03	7.05E-03	1.07E-02	9.90E-03	8.83E-03	8.26E-03	1.01E-02	9.20E-03	9.86E-03	1.12E-02	1.21E-02	1.34E-02	1.45E-02	1.33E-02	9.72E-03	7.53E-03	7.12E-03	5.77E-03
	Emission in each Box of 1st jet	g/s	2.47E-04	1.69E-04	1.18E-04	9.19E-05	7.95E-05	1.81E-04	4.09E-04	8.82E-04	1.33E-03	1.24E-03	1.10E-03	1.03E-03	1.26E-03	1.15E-03	1.23E-03	1.40E-03	1.51E-03	1.67E-03	1.82E-03	1.66E-03	1.22E-03	9.41E-04	8.91E-04	7.22E-04
	Emission in each Box of 2nd jet	g/s	1.32E-04	9.03E-05	6.30E-05	4.90E-05	4.24E-05	9.67E-05	2.18E-04	4.70E-04	7.10E-04	6.60E-04	5.88E-04	5.51E-04	6.73E-04	6.13E-04	6.57E-04	7.45E-04	8.05E-04	8.92E-04	9.69E-04	8.83E-04	6.48E-04	5.02E-04	4.75E-04	3.85E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0032***	***0.0057***	***0.0053***	***0.0047***	***0.0044***	***0.0060***	***0.0054***	***0.0058***	***0.0066***	***0.0071***	***0.0079***	***0.0087***	***0.0080***	***0.0057***	***0.0043***	***0.0040***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.11E-04	5.59E-04	3.82E-04	2.91E-04	2.50E-04	3.72E-04	8.06E-04	2.15E-03	3.83E-03	3.56E-03	3.15E-03	2.91E-03	3.97E-03	3.57E-03	3.88E-03	4.37E-03	4.74E-03	5.27E-03	5.78E-03	5.32E-03	3.82E-03	2.85E-03	2.68E-03	2.20E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.56E-04	2.80E-04	1.91E-04	1.46E-04	1.25E-04	1.86E-04	4.03E-04	1.07E-03	1.91E-03	1.78E-03	1.57E-03	1.45E-03	1.98E-03	1.78E-03	1.94E-03	2.18E-03	2.37E-03	2.64E-03	2.89E-03	2.66E-03	1.91E-03	1.43E-03	1.34E-03	1.10E-03
	Emission in each Box of 1st jet	g/s	4.45E-05	3.50E-05	2.39E-05	1.82E-05	1.56E-05	2.33E-05	5.04E-05	1.34E-04	2.39E-04	2.23E-04	1.97E-04	1.82E-04	2.48E-04	2.23E-04	2.43E-04	2.73E-04	2.96E-04	3.30E-04	3.61E-04	3.32E-04	2.39E-04	1.78E-04	1.67E-04	1.37E-04
	Emission in each Box of 2nd jet	g/s	2.37E-05	1.86E-05	1.27E-05	9.70E-06	8.33E-06	1.24E-05	2.69E-05	7.16E-05	1.28E-04	1.19E-04	1.05E-04	9.70E-05	1.32E-04	1.19E-04	1.29E-04	1.46E-04	1.58E-04	1.76E-04	1.93E-04	1.77E-04	1.27E-04	9.51E-05	8.92E-05	7.32E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2406	0.1997	0.2019	0.2134	0.2209	0.4190	0.4425	0.3859	0.3858	0.3654	0.3584	0.3502	0.3201	0.3135	0.3198	0.3413	0.3523	0.3643	0.3741	0.3569	0.3194	0.3034	0.3030	0.2783
	NO2	g/vehicle/km	0.0435	0.0416	0.0412	0.0426	0.0438	0.0540	0.0548	0.0591	0.0698	0.0662	0.0643	0.0620	0.0633	0.0612	0.0632	0.0671	0.0695	0.0722	0.0748	0.0720	0.0631	0.0578	0.0573	0.0532
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0056***	***0.0038***	***0.0026***	***0.0021***	***0.0018***	***0.0041***	***0.0091***	***0.0198***	***0.0297***	***0.0272***	***0.0244***	***0.0229***	***0.0280***	***0.0257***	***0.0277***	***0.0312***	***0.0336***	***0.0375***	***0.0407***	***0.0373***	***0.0274***	***0.0212***	***0.0199***	***0.0161***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.70E-03	2.51E-03	1.75E-03	1.37E-03	1.19E-03	2.72E-03	6.08E-03	1.32E-02	1.98E-02	1.82E-02	1.63E-02	1.52E-02	1.86E-02	1.71E-02	1.85E-02	2.08E-02	2.24E-02	2.50E-02	2.71E-02	2.49E-02	1.82E-02	1.42E-02	1.32E-02	1.07E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.85E-03	1.26E-03	8.74E-04	6.87E-04	5.94E-04	1.36E-03	3.04E-03	6.61E-03	9.89E-03	9.08E-03	8.15E-03	7.62E-03	9.32E-03	8.56E-03	9.24E-03	1.04E-02	1.12E-02	1.25E-02	1.36E-02	1.24E-02	9.12E-03	7.08E-03	6.62E-03	5.36E-03
	Emission in each Box of 1st jet	g/s	2.31E-04	1.57E-04	1.09E-04	8.59E-05	7.42E-05	1.70E-04	3.80E-04	8.26E-04	1.24E-03	1.13E-03	1.02E-03	9.53E-04	1.17E-03	1.07E-03	1.16E-03	1.30E-03	1.40E-03	1.56E-03	1.70E-03	1.56E-03	1.14E-03	8.85E-04	8.28E-04	6.70E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	8.37E-05	5.83E-05	4.58E-05	3.96E-05	9.05E-05	2.03E-04	4.40E-04	6.59E-04	6.05E-04	5.43E-04	5.08E-04	6.22E-04	5.70E-04	6.16E-04	6.92E-04	7.47E-04	8.33E-04	9.04E-04	8.29E-04	6.08E-04	4.72E-04	4.41E-04	3.58E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0030***	***0.0054***	***0.0049***	***0.0044***	***0.0041***	***0.0055***	***0.0050***	***0.0055***	***0.0061***	***0.0066***	***0.0074***	***0.0081***	***0.0075***	***0.0054***	***0.0040***	***0.0038***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.70E-04	5.23E-04	3.56E-04	2.74E-04	2.35E-04	3.50E-04	7.52E-04	2.02E-03	3.58E-03	3.29E-03	2.92E-03	2.70E-03	3.69E-03	3.34E-03	3.65E-03	4.08E-03	4.42E-03	4.95E-03	5.42E-03	5.02E-03	3.60E-03	2.69E-03	2.51E-03	2.05E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.35E-04	2.62E-04	1.78E-04	1.37E-04	1.18E-04	1.75E-04	3.76E-04	1.01E-03	1.79E-03	1.65E-03	1.46E-03	1.35E-03	1.84E-03	1.67E-03	1.83E-03	2.04E-03	2.21E-03	2.47E-03	2.71E-03	2.51E-03	1.80E-03	1.35E-03	1.25E-03	1.03E-03
	Emission in each Box of 1st jet	g/s	4.19E-05	3.27E-05	2.23E-05	1.71E-05	1.47E-05	2.19E-05	4.70E-05	1.26E-04	2.23E-04	2.06E-04	1.83E-04	1.69E-04	2.30E-04	2.09E-04	2.28E-04	2.55E-04	2.76E-04	3.09E-04	3.39E-04	3.14E-04	2.25E-04	1.68E-04	1.57E-04	1.28E-04
	Emission in each Box of 2nd jet	g/s	2.23E-05	1.74E-05	1.19E-05	9.14E-06	7.84E-06	1.17E-05	2.51E-05	6.74E-05	1.19E-04	1.10E-04	9.74E-05	9.00E-05	1.23E-04	1.11E-04	1.22E-04	1.36E-04	1.47E-04	1.65E-04	1.81E-04	1.67E-04	1.20E-04	8.98E-05	8.36E-05	6.84E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2272	0.1887	0.1912	0.1992	0.2063	0.3929	0.4160	0.3635	0.3641	0.3480	0.3376	0.3343	0.3056	0.2947	0.3007	0.3247	0.3318	0.3448	0.3567	0.3373	0.3007	0.2855	0.2850	0.2624
	NO2	g/vehicle/km	0.0413	0.0396	0.0393	0.0401	0.0412	0.0509	0.0517	0.0559	0.0661	0.0633	0.0607	0.0593	0.0605	0.0577	0.0596	0.0639	0.0656	0.0685	0.0715	0.0683	0.0597	0.0546	0.0542	0.0504
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0052***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0038***	***0.0086***	***0.0187***	***0.0280***	***0.0259***	***0.0230***	***0.0218***	***0.0267***	***0.0241***	***0.0261***	***0.0296***	***0.0317***	***0.0355***	***0.0388***	***0.0353***	***0.0258***	***0.0200***	***0.0187***	***0.0152***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.50E-03	2.37E-03	1.66E-03	1.28E-03	1.11E-03	2.55E-03	5.71E-03	1.24E-02	1.87E-02	1.73E-02	1.53E-02	1.46E-02	1.78E-02	1.61E-02	1.74E-02	1.98E-02	2.11E-02	2.36E-02	2.59E-02	2.35E-02	1.72E-02	1.33E-02	1.25E-02	1.01E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.75E-03	1.19E-03	8.28E-04	6.41E-04	5.54E-04	1.27E-03	2.86E-03	6.22E-03	9.33E-03	8.64E-03	7.67E-03	7.28E-03	8.90E-03	8.04E-03	8.69E-03	9.88E-03	1.06E-02	1.18E-02	1.29E-02	1.18E-02	8.58E-03	6.66E-03	6.23E-03	5.06E-03
	Emission in each Box of 1st jet	g/s	2.19E-04	1.48E-04	1.03E-04	8.02E-05	6.93E-05	1.59E-04	3.57E-04	7.78E-04	1.17E-03	1.08E-03	9.59E-04	9.10E-04	1.11E-03	1.01E-03	1.09E-03	1.24E-03	1.32E-03	1.48E-03	1.62E-03	1.47E-03	1.07E-03	8.32E-04	7.79E-04	6.32E-04
	Emission in each Box of 2nd jet	g/s	1.17E-04	7.91E-05	5.52E-05	4.28E-05	3.69E-05	8.49E-05	1.90E-04	4.15E-04	6.22E-04	5.76E-04	5.11E-04	4.85E-04	5.93E-04	5.36E-04	5.79E-04	6.59E-04	7.04E-04	7.88E-04	8.62E-04	7.84E-04	5.72E-04	4.44E-04	4.15E-04	3.37E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0029***	***0.0051***	***0.0047***	***0.0041***	***0.0039***	***0.0053***	***0.0047***	***0.0052***	***0.0058***	***0.0063***	***0.0070***	***0.0078***	***0.0071***	***0.0051***	***0.0038***	***0.0036***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.36E-04	4.98E-04	3.40E-04	2.58E-04	2.22E-04	3.30E-04	7.10E-04	1.91E-03	3.39E-03	3.14E-03	2.76E-03	2.58E-03	3.53E-03	3.15E-03	3.45E-03	3.89E-03	4.17E-03	4.70E-03	5.18E-03	4.76E-03	3.41E-03	2.55E-03	2.37E-03	1.94E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.18E-04	2.49E-04	1.70E-04	1.29E-04	1.11E-04	1.65E-04	3.55E-04	9.57E-04	1.69E-03	1.57E-03	1.38E-03	1.29E-03	1.76E-03	1.57E-03	1.72E-03	1.94E-03	2.09E-03	2.35E-03	2.59E-03	2.38E-03	1.70E-03	1.27E-03	1.18E-03	9.72E-04
	Emission in each Box of 1st jet	g/s	3.98E-05	3.11E-05	2.12E-05	1.62E-05	1.38E-05	2.06E-05	4.44E-05	1.20E-04	2.12E-04	1.97E-04	1.72E-04	1.61E-04	2.20E-04	1.97E-04	2.15E-04	2.43E-04	2.61E-04	2.94E-04	3.24E-04	2.98E-04	2.13E-04	1.59E-04	1.48E-04	1.21E-04
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.66E-05	1.13E-05	8.62E-06	7.38E-06	1.10E-05	2.37E-05	6.38E-05	1.13E-04	1.05E-04	9.20E-05	8.61E-05	1.18E-04	1.05E-04	1.15E-04	1.30E-04	1.39E-04	1.57E-04	1.73E-04	1.59E-04	1.14E-04	8.49E-05	7.90E-05	6.48E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2136	0.1771	0.1787	0.1907	0.1975	0.3780	0.4004	0.3465	0.3472	0.3319	0.3215	0.3179	0.2906	0.2849	0.2907	0.3086	0.3218	0.3284	0.3398	0.3198	0.2856	0.2755	0.2739	0.2511
	NO2	g/vehicle/km	0.0391	0.0374	0.0370	0.0386	0.0397	0.0491	0.0499	0.0534	0.0632	0.0605	0.0580	0.0566	0.0577	0.0558	0.0578	0.0609	0.0637	0.0654	0.0683	0.0649	0.0569	0.0528	0.0522	0.0484
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0049***	***0.0033***	***0.0023***	***0.0018***	***0.0016***	***0.0037***	***0.0082***	***0.0178***	***0.0267***	***0.0247***	***0.0219***	***0.0208***	***0.0254***	***0.0233***	***0.0252***	***0.0282***	***0.0307***	***0.0338***	***0.0370***	***0.0334***	***0.0245***	***0.0193***	***0.0180***	***0.0145***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.29E-03	2.23E-03	1.55E-03	1.23E-03	1.06E-03	2.45E-03	5.50E-03	1.19E-02	1.78E-02	1.65E-02	1.46E-02	1.38E-02	1.69E-02	1.56E-02	1.68E-02	1.88E-02	2.05E-02	2.25E-02	2.46E-02	2.23E-02	1.63E-02	1.29E-02	1.20E-02	9.68E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.64E-03	1.11E-03	7.73E-04	6.14E-04	5.31E-04	1.23E-03	2.75E-03	5.93E-03	8.90E-03	8.24E-03	7.31E-03	6.92E-03	8.46E-03	7.78E-03	8.40E-03	9.39E-03	1.02E-02	1.13E-02	1.23E-02	1.11E-02	8.15E-03	6.43E-03	5.99E-03	4.84E-03
	Emission in each Box of 1st jet	g/s	2.05E-04	1.39E-04	9.67E-05	7.67E-05	6.63E-05	1.53E-04	3.44E-04	7.42E-04	1.11E-03	1.03E-03	9.13E-04	8.65E-04	1.06E-03	9.72E-04	1.05E-03	1.17E-03	1.28E-03	1.41E-03	1.54E-03	1.39E-03	1.02E-03	8.03E-04	7.48E-04	6.05E-04
	Emission in each Box of 2nd jet	g/s	1.10E-04	7.43E-05	5.16E-05	4.09E-05	3.54E-05	8.17E-05	1.83E-04	3.95E-04	5.93E-04	5.50E-04	4.87E-04	4.61E-04	5.64E-04	5.18E-04	5.60E-04	6.26E-04	6.82E-04	7.51E-04	8.21E-04	7.43E-04	5.44E-04	4.28E-04	3.99E-04	3.23E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0027***	***0.0049***	***0.0045***	***0.0040***	***0.0037***	***0.0050***	***0.0046***	***0.0050***	***0.0056***	***0.0061***	***0.0067***	***0.0074***	***0.0068***	***0.0049***	***0.0037***	***0.0034***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.02E-04	4.71E-04	3.20E-04	2.49E-04	2.13E-04	3.18E-04	6.85E-04	1.83E-03	3.24E-03	3.00E-03	2.64E-03	2.46E-03	3.36E-03	3.05E-03	3.34E-03	3.71E-03	4.05E-03	4.48E-03	4.95E-03	4.53E-03	3.25E-03	2.46E-03	2.28E-03	1.87E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.01E-04	2.35E-04	1.60E-04	1.24E-04	1.07E-04	1.59E-04	3.43E-04	9.14E-04	1.62E-03	1.50E-03	1.32E-03	1.23E-03	1.68E-03	1.52E-03	1.67E-03	1.85E-03	2.03E-03	2.24E-03	2.47E-03	2.26E-03	1.62E-03	1.23E-03	1.14E-03	9.33E-04
	Emission in each Box of 1st jet	g/s	3.76E-05	2.94E-05	2.00E-05	1.55E-05	1.33E-05	1.99E-05	4.28E-05	1.14E-04	2.02E-04	1.88E-04	1.65E-04	1.54E-04	2.10E-04	1.91E-04	2.09E-04	2.32E-04	2.53E-04	2.80E-04	3.09E-04	2.83E-04	2.03E-04	1.54E-04	1.43E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	2.01E-05	1.57E-05	1.07E-05	8.29E-06	7.10E-06	1.06E-05	2.28E-05	6.10E-05	1.08E-04	1.00E-04	8.79E-05	8.21E-05	1.12E-04	1.02E-04	1.11E-04	1.24E-04	1.35E-04	1.49E-04	1.65E-04	1.51E-04	1.08E-04	8.21E-05	7.60E-05	6.22E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1922	0.1582	0.1601	0.1664	0.1724	0.3303	0.3457	0.3014	0.3060	0.2910	0.2867	0.2828	0.2604	0.2541	0.2611	0.2759	0.2869	0.2971	0.2999	0.2875	0.2562	0.2403	0.2408	0.2203
	NO2	g/vehicle/km	0.0354	0.0337	0.0334	0.0341	0.0350	0.0432	0.0434	0.0468	0.0560	0.0533	0.0519	0.0506	0.0519	0.0500	0.0521	0.0547	0.0571	0.0594	0.0606	0.0586	0.0512	0.0464	0.0461	0.0427
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0044***	***0.0030***	***0.0021***	***0.0016***	***0.0014***	***0.0032***	***0.0071***	***0.0155***	***0.0235***	***0.0217***	***0.0195***	***0.0185***	***0.0228***	***0.0208***	***0.0226***	***0.0252***	***0.0274***	***0.0306***	***0.0326***	***0.0301***	***0.0219***	***0.0168***	***0.0158***	***0.0127***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.96E-03	1.99E-03	1.39E-03	1.07E-03	9.26E-04	2.14E-03	4.75E-03	1.03E-02	1.57E-02	1.45E-02	1.30E-02	1.23E-02	1.52E-02	1.39E-02	1.51E-02	1.68E-02	1.83E-02	2.04E-02	2.17E-02	2.00E-02	1.46E-02	1.12E-02	1.05E-02	8.49E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.48E-03	9.95E-04	6.93E-04	5.36E-04	4.63E-04	1.07E-03	2.37E-03	5.16E-03	7.84E-03	7.23E-03	6.52E-03	6.16E-03	7.58E-03	6.94E-03	7.54E-03	8.40E-03	9.13E-03	1.02E-02	1.09E-02	1.00E-02	7.31E-03	5.61E-03	5.26E-03	4.25E-03
	Emission in each Box of 1st jet	g/s	1.85E-04	1.24E-04	8.66E-05	6.70E-05	5.79E-05	1.34E-04	2.97E-04	6.45E-04	9.80E-04	9.04E-04	8.15E-04	7.70E-04	9.48E-04	8.67E-04	9.43E-04	1.05E-03	1.14E-03	1.27E-03	1.36E-03	1.25E-03	9.14E-04	7.01E-04	6.58E-04	5.31E-04
	Emission in each Box of 2nd jet	g/s	9.86E-05	6.63E-05	4.62E-05	3.57E-05	3.09E-05	7.14E-05	1.58E-04	3.44E-04	5.23E-04	4.82E-04	4.34E-04	4.10E-04	5.06E-04	4.62E-04	5.03E-04	5.60E-04	6.08E-04	6.79E-04	7.25E-04	6.68E-04	4.88E-04	3.74E-04	3.51E-04	2.83E-04
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0043***	***0.0040***	***0.0035***	***0.0033***	***0.0045***	***0.0041***	***0.0045***	***0.0050***	***0.0054***	***0.0061***	***0.0066***	***0.0061***	***0.0044***	***0.0032***	***0.0030***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.45E-04	4.24E-04	2.89E-04	2.19E-04	1.88E-04	2.80E-04	5.96E-04	1.60E-03	2.87E-03	2.65E-03	2.36E-03	2.20E-03	3.02E-03	2.73E-03	3.01E-03	3.33E-03	3.63E-03	4.07E-03	4.39E-03	4.09E-03	2.92E-03	2.16E-03	2.02E-03	1.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.72E-04	2.12E-04	1.45E-04	1.10E-04	9.40E-05	1.40E-04	2.98E-04	8.01E-04	1.43E-03	1.32E-03	1.18E-03	1.10E-03	1.51E-03	1.37E-03	1.50E-03	1.66E-03	1.82E-03	2.04E-03	2.20E-03	2.04E-03	1.46E-03	1.08E-03	1.01E-03	8.24E-04
	Emission in each Box of 1st jet	g/s	3.40E-05	2.65E-05	1.81E-05	1.37E-05	1.17E-05	1.75E-05	3.72E-05	1.00E-04	1.79E-04	1.66E-04	1.48E-04	1.38E-04	1.89E-04	1.71E-04	1.88E-04	2.08E-04	2.27E-04	2.55E-04	2.74E-04	2.55E-04	1.83E-04	1.35E-04	1.26E-04	1.03E-04
	Emission in each Box of 2nd jet	g/s	1.82E-05	1.41E-05	9.65E-06	7.31E-06	6.27E-06	9.33E-06	1.99E-05	5.34E-05	9.56E-05	8.83E-05	7.87E-05	7.34E-05	1.01E-04	9.10E-05	1.00E-04	1.11E-04	1.21E-04	1.36E-04	1.46E-04	1.36E-04	9.75E-05	7.21E-05	6.72E-05	5.49E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1856	0.1535	0.1593	0.1655	0.1705	0.3267	0.3377	0.2978	0.2995	0.2905	0.2778	0.2740	0.2506	0.2462	0.2495	0.2674	0.2823	0.2901	0.2946	0.2843	0.2532	0.2390	0.2380	0.2190
	NO2	g/vehicle/km	0.0342	0.0327	0.0332	0.0339	0.0346	0.0427	0.0424	0.0463	0.0549	0.0533	0.0504	0.0490	0.0501	0.0485	0.0499	0.0531	0.0562	0.0581	0.0595	0.0580	0.0507	0.0461	0.0457	0.0425
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0043***	***0.0029***	***0.0021***	***0.0016***	***0.0014***	***0.0032***	***0.0070***	***0.0153***	***0.0230***	***0.0217***	***0.0189***	***0.0179***	***0.0219***	***0.0202***	***0.0216***	***0.0244***	***0.0269***	***0.0298***	***0.0320***	***0.0297***	***0.0217***	***0.0167***	***0.0156***	***0.0127***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.86E-03	1.93E-03	1.38E-03	1.07E-03	9.16E-04	2.12E-03	4.64E-03	1.02E-02	1.54E-02	1.44E-02	1.26E-02	1.19E-02	1.46E-02	1.34E-02	1.44E-02	1.63E-02	1.80E-02	1.99E-02	2.14E-02	1.98E-02	1.45E-02	1.11E-02	1.04E-02	8.44E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.43E-03	9.66E-04	6.89E-04	5.33E-04	4.58E-04	1.06E-03	2.32E-03	5.10E-03	7.68E-03	7.22E-03	6.31E-03	5.97E-03	7.30E-03	6.72E-03	7.21E-03	8.14E-03	8.98E-03	9.95E-03	1.07E-02	9.91E-03	7.23E-03	5.57E-03	5.20E-03	4.22E-03
	Emission in each Box of 1st jet	g/s	1.79E-04	1.21E-04	8.62E-05	6.66E-05	5.73E-05	1.32E-04	2.90E-04	6.37E-04	9.59E-04	9.02E-04	7.89E-04	7.46E-04	9.12E-04	8.40E-04	9.01E-04	1.02E-03	1.12E-03	1.24E-03	1.33E-03	1.24E-03	9.04E-04	6.97E-04	6.50E-04	5.28E-04
	Emission in each Box of 2nd jet	g/s	9.52E-05	6.44E-05	4.60E-05	3.55E-05	3.05E-05	7.06E-05	1.55E-04	3.40E-04	5.12E-04	4.81E-04	4.21E-04	3.98E-04	4.87E-04	4.48E-04	4.81E-04	5.42E-04	5.99E-04	6.63E-04	7.12E-04	6.61E-04	4.82E-04	3.72E-04	3.47E-04	2.81E-04
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0042***	***0.0040***	***0.0034***	***0.0032***	***0.0044***	***0.0040***	***0.0043***	***0.0048***	***0.0054***	***0.0060***	***0.0065***	***0.0061***	***0.0043***	***0.0032***	***0.0030***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.26E-04	4.12E-04	2.87E-04	2.18E-04	1.86E-04	2.77E-04	5.83E-04	1.58E-03	2.81E-03	2.65E-03	2.29E-03	2.14E-03	2.92E-03	2.65E-03	2.88E-03	3.23E-03	3.58E-03	3.98E-03	4.32E-03	4.04E-03	2.89E-03	2.15E-03	2.00E-03	1.64E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.63E-04	2.06E-04	1.44E-04	1.09E-04	9.30E-05	1.39E-04	2.91E-04	7.92E-04	1.41E-03	1.32E-03	1.15E-03	1.07E-03	1.46E-03	1.32E-03	1.44E-03	1.61E-03	1.79E-03	1.99E-03	2.16E-03	2.02E-03	1.45E-03	1.08E-03	9.98E-04	8.20E-04
	Emission in each Box of 1st jet	g/s	3.29E-05	2.57E-05	1.80E-05	1.36E-05	1.16E-05	1.73E-05	3.64E-05	9.90E-05	1.76E-04	1.65E-04	1.43E-04	1.33E-04	1.82E-04	1.66E-04	1.80E-04	2.02E-04	2.24E-04	2.49E-04	2.70E-04	2.53E-04	1.81E-04	1.35E-04	1.25E-04	1.02E-04
	Emission in each Box of 2nd jet	g/s	1.75E-05	1.37E-05	9.58E-06	7.27E-06	6.20E-06	9.23E-06	1.94E-05	5.28E-05	9.37E-05	8.82E-05	7.63E-05	7.12E-05	9.72E-05	8.83E-05	9.61E-05	1.08E-04	1.19E-04	1.33E-04	1.44E-04	1.35E-04	9.65E-05	7.17E-05	6.65E-05	5.46E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1867	0.1526	0.1544	0.1603	0.1661	0.3167	0.3377	0.2905	0.2923	0.2811	0.2789	0.2771	0.2460	0.2419	0.2524	0.2686	0.2773	0.2891	0.2913	0.2811	0.2488	0.2361	0.2350	0.2136
	NO2	g/vehicle/km	0.0344	0.0326	0.0323	0.0329	0.0338	0.0415	0.0424	0.0452	0.0536	0.0515	0.0506	0.0496	0.0492	0.0477	0.0504	0.0532	0.0552	0.0578	0.0589	0.0574	0.0498	0.0456	0.0451	0.0415
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0043***	***0.0029***	***0.0020***	***0.0015***	***0.0013***	***0.0031***	***0.0070***	***0.0149***	***0.0225***	***0.0209***	***0.0190***	***0.0181***	***0.0215***	***0.0198***	***0.0219***	***0.0245***	***0.0265***	***0.0297***	***0.0317***	***0.0294***	***0.0213***	***0.0165***	***0.0154***	***0.0124***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.87E-03	1.92E-03	1.34E-03	1.03E-03	8.93E-04	2.05E-03	4.64E-03	9.95E-03	1.50E-02	1.40E-02	1.27E-02	1.21E-02	1.43E-02	1.32E-02	1.46E-02	1.63E-02	1.76E-02	1.98E-02	2.11E-02	1.96E-02	1.42E-02	1.10E-02	1.03E-02	8.24E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.44E-03	9.60E-04	6.68E-04	5.16E-04	4.46E-04	1.03E-03	2.32E-03	4.97E-03	7.49E-03	6.98E-03	6.34E-03	6.03E-03	7.17E-03	6.60E-03	7.29E-03	8.17E-03	8.82E-03	9.91E-03	1.06E-02	9.80E-03	7.10E-03	5.51E-03	5.14E-03	4.12E-03
	Emission in each Box of 1st jet	g/s	1.80E-04	1.20E-04	8.36E-05	6.45E-05	5.58E-05	1.28E-04	2.90E-04	6.22E-04	9.37E-04	8.73E-04	7.92E-04	7.54E-04	8.96E-04	8.25E-04	9.11E-04	1.02E-03	1.10E-03	1.24E-03	1.32E-03	1.22E-03	8.88E-04	6.88E-04	6.42E-04	5.15E-04
	Emission in each Box of 2nd jet	g/s	9.58E-05	6.40E-05	4.46E-05	3.44E-05	2.98E-05	6.84E-05	1.55E-04	3.32E-04	4.99E-04	4.65E-04	4.23E-04	4.02E-04	4.78E-04	4.40E-04	4.86E-04	5.45E-04	5.88E-04	6.61E-04	7.04E-04	6.53E-04	4.73E-04	3.67E-04	3.42E-04	2.75E-04
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0023***	***0.0041***	***0.0038***	***0.0034***	***0.0032***	***0.0043***	***0.0039***	***0.0044***	***0.0049***	***0.0053***	***0.0060***	***0.0064***	***0.0060***	***0.0043***	***0.0032***	***0.0030***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.29E-04	4.10E-04	2.79E-04	2.12E-04	1.82E-04	2.69E-04	5.83E-04	1.55E-03	2.75E-03	2.56E-03	2.30E-03	2.16E-03	2.86E-03	2.60E-03	2.91E-03	3.24E-03	3.51E-03	3.97E-03	4.27E-03	4.00E-03	2.84E-03	2.13E-03	1.97E-03	1.60E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.65E-04	2.05E-04	1.40E-04	1.06E-04	9.09E-05	1.34E-04	2.91E-04	7.74E-04	1.37E-03	1.28E-03	1.15E-03	1.08E-03	1.43E-03	1.30E-03	1.46E-03	1.62E-03	1.76E-03	1.98E-03	2.14E-03	2.00E-03	1.42E-03	1.06E-03	9.86E-04	8.00E-04
	Emission in each Box of 1st jet	g/s	3.31E-05	2.56E-05	1.75E-05	1.33E-05	1.14E-05	1.68E-05	3.64E-05	9.67E-05	1.72E-04	1.60E-04	1.44E-04	1.35E-04	1.79E-04	1.63E-04	1.82E-04	2.02E-04	2.20E-04	2.48E-04	2.67E-04	2.50E-04	1.78E-04	1.33E-04	1.23E-04	1.00E-04
	Emission in each Box of 2nd jet	g/s	1.76E-05	1.37E-05	9.31E-06	7.07E-06	6.06E-06	8.97E-06	1.94E-05	5.16E-05	9.15E-05	8.53E-05	7.67E-05	7.20E-05	9.55E-05	8.68E-05	9.70E-05	1.08E-04	1.17E-04	1.32E-04	1.42E-04	1.33E-04	9.48E-05	7.09E-05	6.57E-05	5.34E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																								
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1891	0.1556	0.1575	0.1636	0.1695	0.3233	0.3444	0.2978	0.2958	0.2820	0.2833	0.2776	0.2506	0.2462	0.2512	0.2674	0.2840	0.2883	0.2997	0.2810	0.2489	0.2362	0.2352	0.2165
	NO2	g/vehicle/km	0.0348	0.0332	0.0329	0.0335	0.0345	0.0423	0.0432	0.0463	0.0542	0.0517	0.0514	0.0496	0.0501	0.0485	0.0502	0.0531	0.0566	0.0577	0.0605	0.0574	0.0499	0.0456	0.0452	0.0420
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0044***	***0.0029***	***0.0020***	***0.0016***	***0.0014***	***0.0031***	***0.0071***	***0.0153***	***0.0227***	***0.0210***	***0.0193***	***0.0181***	***0.0219***	***0.0202***	***0.0218***	***0.0244***	***0.0271***	***0.0297***	***0.0326***	***0.0294***	***0.0213***	***0.0165***	***0.0154***	***0.0125***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.91E-03	1.96E-03	1.36E-03	1.05E-03	9.11E-04	2.10E-03	4.73E-03	1.02E-02	1.52E-02	1.40E-02	1.29E-02	1.21E-02	1.46E-02	1.34E-02	1.45E-02	1.63E-02	1.81E-02	1.98E-02	2.17E-02	1.96E-02	1.42E-02	1.10E-02	1.03E-02	8.35E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.46E-03	9.79E-04	6.82E-04	5.27E-04	4.55E-04	1.05E-03	2.36E-03	5.10E-03	7.58E-03	7.01E-03	6.44E-03	6.04E-03	7.30E-03	6.72E-03	7.26E-03	8.14E-03	9.04E-03	9.88E-03	1.09E-02	9.80E-03	7.11E-03	5.51E-03	5.14E-03	4.17E-03
	Emission in each Box of 1st jet	g/s	1.82E-04	1.22E-04	8.52E-05	6.58E-05	5.69E-05	1.31E-04	2.96E-04	6.37E-04	9.48E-04	8.76E-04	8.05E-04	7.56E-04	9.12E-04	8.40E-04	9.07E-04	1.02E-03	1.13E-03	1.24E-03	1.36E-03	1.22E-03	8.88E-04	6.89E-04	6.43E-04	5.22E-04
	Emission in each Box of 2nd jet	g/s	9.70E-05	6.53E-05	4.54E-05	3.51E-05	3.04E-05	6.98E-05	1.58E-04	3.40E-04	5.05E-04	4.67E-04	4.29E-04	4.03E-04	4.87E-04	4.48E-04	4.84E-04	5.42E-04	6.02E-04	6.59E-04	7.24E-04	6.53E-04	4.74E-04	3.67E-04	3.43E-04	2.78E-04
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0042***	***0.0039***	***0.0035***	***0.0032***	***0.0044***	***0.0040***	***0.0043***	***0.0048***	***0.0054***	***0.0059***	***0.0066***	***0.0060***	***0.0043***	***0.0032***	***0.0030***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.36E-04	4.17E-04	2.85E-04	2.16E-04	1.85E-04	2.74E-04	5.94E-04	1.58E-03	2.78E-03	2.57E-03	2.34E-03	2.16E-03	2.92E-03	2.65E-03	2.90E-03	3.23E-03	3.60E-03	3.96E-03	4.39E-03	4.00E-03	2.85E-03	2.13E-03	1.97E-03	1.62E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.68E-04	2.09E-04	1.42E-04	1.08E-04	9.26E-05	1.37E-04	2.97E-04	7.92E-04	1.39E-03	1.28E-03	1.17E-03	1.08E-03	1.46E-03	1.32E-03	1.45E-03	1.61E-03	1.80E-03	1.98E-03	2.19E-03	2.00E-03	1.42E-03	1.06E-03	9.87E-04	8.10E-04
	Emission in each Box of 1st jet	g/s	3.35E-05	2.61E-05	1.78E-05	1.35E-05	1.16E-05	1.71E-05	3.71E-05	9.90E-05	1.74E-04	1.61E-04	1.46E-04	1.35E-04	1.82E-04	1.66E-04	1.81E-04	2.02E-04	2.25E-04	2.47E-04	2.74E-04	2.50E-04	1.78E-04	1.33E-04	1.23E-04	1.01E-04
	Emission in each Box of 2nd jet	g/s	1.79E-05	1.39E-05	9.49E-06	7.20E-06	6.17E-06	9.14E-06	1.98E-05	5.28E-05	9.26E-05	8.57E-05	7.78E-05	7.20E-05	9.72E-05	8.83E-05	9.67E-05	1.08E-04	1.20E-04	1.32E-04	1.46E-04	1.33E-04	9.49E-05	7.10E-05	6.58E-05	5.40E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1878	0.1544	0.1563	0.1613	0.1724	0.3285	0.3482	0.2941	0.2982	0.2850	0.2867	0.2771	0.2534	0.2525	0.2558	0.2741	0.2811	0.2872	0.2982	0.2777	0.2562	0.2417	0.2408	0.2216
	NO2	g/vehicle/km	0.0345	0.0329	0.0326	0.0331	0.0350	0.0430	0.0437	0.0457	0.0546	0.0523	0.0519	0.0496	0.0506	0.0497	0.0511	0.0543	0.0559	0.0575	0.0602	0.0567	0.0512	0.0466	0.0461	0.0430
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0043***	***0.0029***	***0.0020***	***0.0016***	***0.0014***	***0.0032***	***0.0072***	***0.0151***	***0.0229***	***0.0212***	***0.0195***	***0.0181***	***0.0221***	***0.0207***	***0.0222***	***0.0250***	***0.0268***	***0.0295***	***0.0324***	***0.0290***	***0.0219***	***0.0169***	***0.0158***	***0.0128***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.89E-03	1.94E-03	1.35E-03	1.04E-03	9.26E-04	2.13E-03	4.78E-03	1.01E-02	1.53E-02	1.42E-02	1.30E-02	1.21E-02	1.48E-02	1.38E-02	1.48E-02	1.67E-02	1.79E-02	1.97E-02	2.16E-02	1.94E-02	1.46E-02	1.13E-02	1.05E-02	8.54E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.45E-03	9.71E-04	6.77E-04	5.19E-04	4.63E-04	1.06E-03	2.39E-03	5.04E-03	7.64E-03	7.08E-03	6.52E-03	6.03E-03	7.38E-03	6.89E-03	7.39E-03	8.34E-03	8.94E-03	9.85E-03	1.08E-02	9.68E-03	7.31E-03	5.64E-03	5.26E-03	4.27E-03
	Emission in each Box of 1st jet	g/s	1.81E-04	1.21E-04	8.46E-05	6.49E-05	5.79E-05	1.33E-04	2.99E-04	6.29E-04	9.55E-04	8.85E-04	8.15E-04	7.54E-04	9.23E-04	8.61E-04	9.24E-04	1.04E-03	1.12E-03	1.23E-03	1.35E-03	1.21E-03	9.14E-04	7.05E-04	6.58E-04	5.34E-04
	Emission in each Box of 2nd jet	g/s	9.64E-05	6.48E-05	4.51E-05	3.46E-05	3.09E-05	7.10E-05	1.59E-04	3.36E-04	5.09E-04	4.72E-04	4.34E-04	4.02E-04	4.92E-04	4.59E-04	4.93E-04	5.56E-04	5.96E-04	6.56E-04	7.21E-04	6.45E-04	4.88E-04	3.76E-04	3.51E-04	2.85E-04
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0023***	***0.0042***	***0.0039***	***0.0035***	***0.0032***	***0.0044***	***0.0041***	***0.0044***	***0.0050***	***0.0053***	***0.0059***	***0.0065***	***0.0059***	***0.0044***	***0.0033***	***0.0030***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.32E-04	4.14E-04	2.82E-04	2.13E-04	1.88E-04	2.78E-04	6.00E-04	1.57E-03	2.80E-03	2.60E-03	2.36E-03	2.16E-03	2.95E-03	2.71E-03	2.95E-03	3.31E-03	3.56E-03	3.94E-03	4.37E-03	3.95E-03	2.92E-03	2.18E-03	2.02E-03	1.66E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.66E-04	2.07E-04	1.41E-04	1.07E-04	9.40E-05	1.39E-04	3.00E-04	7.83E-04	1.40E-03	1.30E-03	1.18E-03	1.08E-03	1.47E-03	1.36E-03	1.48E-03	1.65E-03	1.78E-03	1.97E-03	2.18E-03	1.98E-03	1.46E-03	1.09E-03	1.01E-03	8.29E-04
	Emission in each Box of 1st jet	g/s	3.32E-05	2.59E-05	1.77E-05	1.33E-05	1.17E-05	1.74E-05	3.75E-05	9.78E-05	1.75E-04	1.62E-04	1.48E-04	1.35E-04	1.84E-04	1.70E-04	1.84E-04	2.07E-04	2.22E-04	2.46E-04	2.73E-04	2.47E-04	1.83E-04	1.36E-04	1.26E-04	1.04E-04
	Emission in each Box of 2nd jet	g/s	1.77E-05	1.38E-05	9.42E-06	7.10E-06	6.27E-06	9.28E-06	2.00E-05	5.22E-05	9.34E-05	8.66E-05	7.87E-05	7.19E-05	9.82E-05	9.05E-05	9.84E-05	1.10E-04	1.19E-04	1.31E-04	1.46E-04	1.32E-04	9.75E-05	7.25E-05	6.72E-05	5.52E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2116	0.1755	0.1769	0.1842	0.1900	0.3629	0.3860	0.3371	0.3376	0.3226	0.3121	0.3088	0.2838	0.2770	0.2826	0.3012	0.3129	0.3190	0.3332	0.3148	0.2822	0.2679	0.2672	0.2448
	NO2	g/vehicle/km	0.0387	0.0371	0.0366	0.0374	0.0383	0.0472	0.0482	0.0521	0.0615	0.0589	0.0564	0.0550	0.0564	0.0543	0.0562	0.0595	0.0621	0.0636	0.0670	0.0639	0.0562	0.0514	0.0510	0.0473
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0049***	***0.0033***	***0.0023***	***0.0018***	***0.0015***	***0.0035***	***0.0080***	***0.0173***	***0.0260***	***0.0240***	***0.0213***	***0.0202***	***0.0248***	***0.0227***	***0.0245***	***0.0275***	***0.0299***	***0.0328***	***0.0362***	***0.0329***	***0.0242***	***0.0187***	***0.0175***	***0.0142***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.26E-03	2.21E-03	1.53E-03	1.19E-03	1.02E-03	2.35E-03	5.30E-03	1.15E-02	1.73E-02	1.60E-02	1.42E-02	1.34E-02	1.65E-02	1.51E-02	1.63E-02	1.83E-02	1.99E-02	2.19E-02	2.42E-02	2.20E-02	1.61E-02	1.25E-02	1.17E-02	9.44E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.63E-03	1.10E-03	7.66E-04	5.93E-04	5.10E-04	1.18E-03	2.65E-03	5.77E-03	8.65E-03	8.01E-03	7.09E-03	6.72E-03	8.27E-03	7.56E-03	8.17E-03	9.16E-03	9.95E-03	1.09E-02	1.21E-02	1.10E-02	8.06E-03	6.25E-03	5.84E-03	4.72E-03
	Emission in each Box of 1st jet	g/s	2.04E-04	1.38E-04	9.57E-05	7.41E-05	6.38E-05	1.47E-04	3.31E-04	7.21E-04	1.08E-03	1.00E-03	8.87E-04	8.40E-04	1.03E-03	9.45E-04	1.02E-03	1.15E-03	1.24E-03	1.37E-03	1.51E-03	1.37E-03	1.01E-03	7.81E-04	7.30E-04	5.90E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.36E-05	5.11E-05	3.95E-05	3.40E-05	7.84E-05	1.77E-04	3.85E-04	5.77E-04	5.34E-04	4.73E-04	4.48E-04	5.51E-04	5.04E-04	5.44E-04	6.11E-04	6.64E-04	7.29E-04	8.05E-04	7.32E-04	5.37E-04	4.17E-04	3.89E-04	3.15E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0027***	***0.0047***	***0.0044***	***0.0038***	***0.0036***	***0.0049***	***0.0044***	***0.0049***	***0.0054***	***0.0059***	***0.0065***	***0.0073***	***0.0067***	***0.0048***	***0.0036***	***0.0033***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.96E-04	4.66E-04	3.17E-04	2.41E-04	2.06E-04	3.06E-04	6.62E-04	1.78E-03	3.15E-03	2.92E-03	2.56E-03	2.40E-03	3.28E-03	2.96E-03	3.25E-03	3.62E-03	3.95E-03	4.36E-03	4.86E-03	4.46E-03	3.21E-03	2.40E-03	2.23E-03	1.82E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.98E-04	2.33E-04	1.58E-04	1.20E-04	1.03E-04	1.53E-04	3.31E-04	8.92E-04	1.58E-03	1.46E-03	1.28E-03	1.20E-03	1.64E-03	1.48E-03	1.62E-03	1.81E-03	1.97E-03	2.18E-03	2.43E-03	2.23E-03	1.60E-03	1.20E-03	1.11E-03	9.11E-04
	Emission in each Box of 1st jet	g/s	3.72E-05	2.91E-05	1.98E-05	1.50E-05	1.28E-05	1.91E-05	4.14E-05	1.11E-04	1.97E-04	1.83E-04	1.60E-04	1.50E-04	2.05E-04	1.85E-04	2.03E-04	2.26E-04	2.47E-04	2.73E-04	3.04E-04	2.79E-04	2.01E-04	1.50E-04	1.39E-04	1.14E-04
	Emission in each Box of 2nd jet	g/s	1.99E-05	1.55E-05	1.06E-05	8.02E-06	6.85E-06	1.02E-05	2.21E-05	5.94E-05	1.05E-04	9.75E-05	8.54E-05	7.99E-05	1.09E-04	9.88E-05	1.08E-04	1.21E-04	1.32E-04	1.45E-04	1.62E-04	1.49E-04	1.07E-04	8.00E-05	7.43E-05	6.07E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involvec	085P2
Road Located	087
Vehicle EF Adopte	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2319	0.1948	0.1968	0.2069	0.2143	0.4087	0.4339	0.3779	0.3798	0.3640	0.3522	0.3464	0.3139	0.3065	0.3126	0.3335	0.3446	0.3573	0.3660	0.3508	0.3128	0.2971	0.2965	0.2730
	NO2	g/vehicle/km	0.0422	0.0408	0.0404	0.0416	0.0427	0.0529	0.0539	0.0581	0.0688	0.0660	0.0633	0.0614	0.0621	0.0599	0.0619	0.0656	0.0681	0.0709	0.0733	0.0709	0.0620	0.0567	0.0563	0.0524
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0054***	***0.0037***	***0.0026***	***0.0020***	***0.0017***	***0.0040***	***0.0089***	***0.0194***	***0.0292***	***0.0271***	***0.0240***	***0.0226***	***0.0274***	***0.0251***	***0.0271***	***0.0304***	***0.0329***	***0.0367***	***0.0398***	***0.0367***	***0.0268***	***0.0208***	***0.0194***	***0.0158***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.57E-03	2.45E-03	1.70E-03	1.33E-03	1.15E-03	2.65E-03	5.96E-03	1.29E-02	1.95E-02	1.81E-02	1.60E-02	1.51E-02	1.83E-02	1.67E-02	1.81E-02	2.03E-02	2.19E-02	2.45E-02	2.65E-02	2.45E-02	1.79E-02	1.39E-02	1.30E-02	1.05E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.79E-03	1.23E-03	8.52E-04	6.66E-04	5.76E-04	1.32E-03	2.98E-03	6.47E-03	9.73E-03	9.04E-03	8.01E-03	7.54E-03	9.14E-03	8.36E-03	9.03E-03	1.01E-02	1.10E-02	1.22E-02	1.33E-02	1.22E-02	8.93E-03	6.93E-03	6.48E-03	5.26E-03
	Emission in each Box of 1st jet	g/s	2.23E-04	1.53E-04	1.06E-04	8.33E-05	7.20E-05	1.66E-04	3.72E-04	8.09E-04	1.22E-03	1.13E-03	1.00E-03	9.43E-04	1.14E-03	1.05E-03	1.13E-03	1.27E-03	1.37E-03	1.53E-03	1.66E-03	1.53E-03	1.12E-03	8.66E-04	8.10E-04	6.58E-04
	Emission in each Box of 2nd jet	g/s	1.19E-04	8.17E-05	5.68E-05	4.44E-05	3.84E-05	8.83E-05	1.99E-04	4.31E-04	6.49E-04	6.03E-04	5.34E-04	5.03E-04	6.10E-04	5.58E-04	6.02E-04	6.76E-04	7.31E-04	8.17E-04	8.84E-04	8.15E-04	5.95E-04	4.62E-04	4.32E-04	3.51E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0030***	***0.0053***	***0.0049***	***0.0043***	***0.0040***	***0.0054***	***0.0049***	***0.0054***	***0.0060***	***0.0065***	***0.0073***	***0.0080***	***0.0074***	***0.0053***	***0.0040***	***0.0037***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.49E-04	5.13E-04	3.50E-04	2.68E-04	2.30E-04	3.43E-04	7.40E-04	1.99E-03	3.53E-03	3.28E-03	2.88E-03	2.67E-03	3.62E-03	3.27E-03	3.58E-03	3.99E-03	4.33E-03	4.86E-03	5.31E-03	4.94E-03	3.54E-03	2.64E-03	2.46E-03	2.02E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.24E-04	2.57E-04	1.75E-04	1.34E-04	1.15E-04	1.71E-04	3.70E-04	9.94E-04	1.76E-03	1.64E-03	1.44E-03	1.34E-03	1.81E-03	1.63E-03	1.79E-03	2.00E-03	2.16E-03	2.43E-03	2.66E-03	2.47E-03	1.77E-03	1.32E-03	1.23E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	4.06E-05	3.21E-05	2.18E-05	1.67E-05	1.44E-05	2.14E-05	4.63E-05	1.24E-04	2.20E-04	2.05E-04	1.80E-04	1.67E-04	2.26E-04	2.04E-04	2.24E-04	2.50E-04	2.71E-04	3.04E-04	3.32E-04	3.09E-04	2.21E-04	1.65E-04	1.54E-04	1.26E-04
	Emission in each Box of 2nd jet	g/s	2.16E-05	1.71E-05	1.17E-05	8.93E-06	7.66E-06	1.14E-05	2.47E-05	6.63E-05	1.18E-04	1.09E-04	9.59E-05	8.91E-05	1.21E-04	1.09E-04	1.19E-04	1.33E-04	1.44E-04	1.62E-04	1.77E-04	1.65E-04	1.18E-04	8.82E-05	8.20E-05	6.73E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	295	203	151	126	152	322	803	1202	1165	1066	1021	1366	1280	1355	1427	1492	1608	1700	1635	1339	1094	1025	904
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2444	0.2039	0.2062	0.2155	0.2257	0.4278	0.4527	0.3940	0.3956	0.3787	0.3656	0.3602	0.3257	0.3180	0.3253	0.3463	0.3575	0.3697	0.3824	0.3621	0.3241	0.3070	0.3103	0.2857
	NO2	g/vehicle/km	0.0442	0.0424	0.0420	0.0430	0.0447	0.0551	0.0560	0.0603	0.0714	0.0685	0.0655	0.0637	0.0643	0.0620	0.0642	0.0680	0.0704	0.0732	0.0763	0.0730	0.0640	0.0584	0.0586	0.0546
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0056***	***0.0038***	***0.0027***	***0.0021***	***0.0018***	***0.0042***	***0.0093***	***0.0202***	***0.0304***	***0.0282***	***0.0249***	***0.0235***	***0.0285***	***0.0260***	***0.0282***	***0.0316***	***0.0341***	***0.0380***	***0.0416***	***0.0379***	***0.0278***	***0.0215***	***0.0203***	***0.0165***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.76E-03	2.57E-03	1.78E-03	1.39E-03	1.21E-03	2.77E-03	6.22E-03	1.35E-02	2.03E-02	1.88E-02	1.66E-02	1.57E-02	1.90E-02	1.74E-02	1.88E-02	2.11E-02	2.27E-02	2.54E-02	2.77E-02	2.52E-02	1.85E-02	1.43E-02	1.36E-02	1.10E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.88E-03	1.28E-03	8.92E-04	6.94E-04	6.06E-04	1.39E-03	3.11E-03	6.75E-03	1.01E-02	9.41E-03	8.31E-03	7.84E-03	9.49E-03	8.68E-03	9.40E-03	1.05E-02	1.14E-02	1.27E-02	1.39E-02	1.26E-02	9.25E-03	7.16E-03	6.78E-03	5.51E-03
	Emission in each Box of 1st jet	g/s	2.35E-04	1.60E-04	1.12E-04	8.67E-05	7.58E-05	1.73E-04	3.89E-04	8.43E-04	1.27E-03	1.18E-03	1.04E-03	9.80E-04	1.19E-03	1.08E-03	1.17E-03	1.32E-03	1.42E-03	1.58E-03	1.73E-03	1.58E-03	1.16E-03	8.95E-04	8.48E-04	6.88E-04
	Emission in each Box of 2nd jet	g/s	1.25E-04	8.55E-05	5.95E-05	4.63E-05	4.04E-05	9.24E-05	2.07E-04	4.50E-04	6.76E-04	6.27E-04	5.54E-04	5.23E-04	6.32E-04	5.79E-04	6.27E-04	7.02E-04	7.58E-04	8.45E-04	9.24E-04	8.42E-04	6.17E-04	4.77E-04	4.52E-04	3.67E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0012***	***0.0031***	***0.0055***	***0.0051***	***0.0045***	***0.0042***	***0.0056***	***0.0051***	***0.0056***	***0.0062***	***0.0067***	***0.0075***	***0.0083***	***0.0076***	***0.0055***	***0.0041***	***0.0038***	***0.0032***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.80E-04	5.33E-04	3.63E-04	2.77E-04	2.40E-04	3.57E-04	7.69E-04	2.06E-03	3.66E-03	3.40E-03	2.98E-03	2.77E-03	3.75E-03	3.38E-03	3.71E-03	4.14E-03	4.48E-03	5.02E-03	5.53E-03	5.09E-03	3.65E-03	2.73E-03	2.56E-03	2.10E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.40E-04	2.67E-04	1.82E-04	1.39E-04	1.20E-04	1.79E-04	3.85E-04	1.03E-03	1.83E-03	1.70E-03	1.49E-03	1.39E-03	1.87E-03	1.69E-03	1.86E-03	2.07E-03	2.24E-03	2.51E-03	2.77E-03	2.54E-03	1.83E-03	1.36E-03	1.28E-03	1.05E-03
	Emission in each Box of 1st jet	g/s	4.25E-05	3.33E-05	2.27E-05	1.73E-05	1.50E-05	2.23E-05	4.81E-05	1.29E-04	2.29E-04	2.13E-04	1.86E-04	1.73E-04	2.34E-04	2.11E-04	2.32E-04	2.59E-04	2.80E-04	3.14E-04	3.46E-04	3.18E-04	2.28E-04	1.70E-04	1.60E-04	1.32E-04
	Emission in each Box of 2nd jet	g/s	2.27E-05	1.78E-05	1.21E-05	9.23E-06	8.00E-06	1.19E-05	2.56E-05	6.88E-05	1.22E-04	1.13E-04	9.92E-05	9.24E-05	1.25E-04	1.13E-04	1.24E-04	1.38E-04	1.49E-04	1.67E-04	1.84E-04	1.70E-04	1.22E-04	9.09E-05	8.54E-05	7.01E-05
RSP Emission Rate		g/s	***3.27E-04***	***2.14E-04***	***1.49E-04***	***1.17E-04***	***1.02E-04***	***2.54E-04***	***5.73E-04***	***1.13E-03***	***1.51E-03***	***1.42E-03***	***1.29E-03***	***1.22E-03***	***1.49E-03***	***1.39E-03***	***1.47E-03***	***1.60E-03***	***1.71E-03***	***1.88E-03***	***2.02E-03***	***1.85E-03***	***1.46E-03***	***1.17E-03***	***1.10E-03***	***9.08E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.18E-04	1.42E-04	9.91E-05	7.81E-05	6.82E-05	1.69E-04	3.82E-04	7.52E-04	1.01E-03	9.46E-04	8.57E-04	8.16E-04	9.96E-04	9.24E-04	9.83E-04	1.07E-03	1.14E-03	1.25E-03	1.34E-03	1.23E-03	9.70E-04	7.83E-04	7.35E-04	6.05E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.09E-04	7.12E-05	4.96E-05	3.90E-05	3.41E-05	8.46E-05	1.91E-04	3.76E-04	5.05E-04	4.73E-04	4.29E-04	4.08E-04	4.98E-04	4.62E-04	4.91E-04	5.34E-04	5.68E-04	6.26E-04	6.72E-04	6.17E-04	4.85E-04	3.92E-04	3.67E-04	3.03E-04
	Emission in each Box of 1st jet	g/s	1.36E-05	8.91E-06	6.19E-06	4.88E-06	4.26E-06	1.06E-05	2.39E-05	4.70E-05	6.31E-05	5.91E-05	5.36E-05	5.10E-05	6.22E-05	5.77E-05	6.14E-05	6.67E-05	7.11E-05	7.83E-05	8.40E-05	7.71E-05	6.06E-05	4.90E-05	4.59E-05	3.78E-05
	Emission in each Box of 2nd jet	g/s	7.26E-06	4.75E-06	3.30E-06	2.60E-06	2.27E-06	5.64E-06	1.27E-05	2.51E-05	3.37E-05	3.15E-05	2.86E-05	2.72E-05	3.32E-05	3.08E-05	3.28E-05	3.56E-05	3.79E-05	4.18E-05	4.48E-05	4.11E-05	3.23E-05	2.61E-05	2.45E-05	2.02E-05
FSP Emission Rate		g/s	***3.01E-04***	***1.97E-04***	***1.37E-04***	***1.08E-04***	***9.40E-05***	***2.33E-04***	***5.27E-04***	***1.04E-03***	***1.39E-03***	***1.31E-03***	***1.18E-03***	***1.13E-03***	***1.37E-03***	***1.27E-03***	***1.36E-03***	***1.47E-03***	***1.57E-03***	***1.73E-03***	***1.85E-03***	***1.70E-03***	***1.34E-03***	***1.08E-03***	***1.02E-03***	***8.37E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.00E-04	1.31E-04	9.11E-05	7.18E-05	6.27E-05	1.56E-04	3.51E-04	6.93E-04	9.26E-04	8.70E-04	7.88E-04	7.51E-04	9.16E-04	8.49E-04	9.04E-04	9.82E-04	1.05E-03	1.15E-03	1.23E-03	1.14E-03	8.92E-04	7.21E-04	6.77E-04	5.58E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.00E-04	6.55E-05	4.56E-05	3.59E-05	3.13E-05	7.78E-05	1.76E-04	3.46E-04	4.63E-04	4.35E-04	3.94E-04	3.75E-04	4.58E-04	4.24E-04	4.52E-04	4.91E-04	5.23E-04	5.76E-04	6.17E-04	5.68E-04	4.46E-04	3.61E-04	3.38E-04	2.79E-04
	Emission in each Box of 1st jet	g/s	1.25E-05	8.19E-06	5.70E-06	4.49E-06	3.92E-06	9.73E-06	2.19E-05	4.33E-05	5.79E-05	5.44E-05	4.93E-05	4.69E-05	5.72E-05	5.30E-05	5.65E-05	6.13E-05	6.53E-05	7.20E-05	7.71E-05	7.09E-05	5.58E-05	4.51E-05	4.23E-05	3.49E-05
	Emission in each Box of 2nd jet	g/s	6.68E-06	4.37E-06	3.04E-06	2.39E-06	2.09E-06	5.19E-06	1.17E-05	2.31E-05	3.09E-05	2.90E-05	2.63E-05	2.50E-05	3.05E-05	2.83E-05	3.01E-05	3.27E-05	3.48E-05	3.84E-05	4.11E-05	3.78E-05	2.97E-05	2.40E-05	2.26E-05	1.86E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2571	0.2154	0.2184	0.2283	0.2366	0.4477	0.4770	0.4119	0.4156	0.3984	0.3884	0.3795	0.3468	0.3371	0.3412	0.3672	0.3794	0.3903	0.4012	0.3801	0.3406	0.3229	0.3260	0.2996
	NO2	g/vehicle/km	0.0462	0.0445	0.0441	0.0452	0.0465	0.0574	0.0587	0.0628	0.0747	0.0717	0.0692	0.0668	0.0681	0.0654	0.0672	0.0718	0.0744	0.0769	0.0797	0.0762	0.0669	0.0611	0.0612	0.0570
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0079***	***0.0053***	***0.0037***	***0.0029***	***0.0025***	***0.0065***	***0.0149***	***0.0292***	***0.0425***	***0.0395***	***0.0354***	***0.0332***	***0.0207***	***0.0188***	***0.0202***	***0.0228***	***0.0246***	***0.0272***	***0.0295***	***0.0268***	***0.0198***	***0.0156***	***0.0147***	***0.0117***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.24E-03	3.50E-03	2.48E-03	1.94E-03	1.70E-03	4.33E-03	9.95E-03	1.95E-02	2.84E-02	2.63E-02	2.36E-02	2.21E-02	1.38E-02	1.25E-02	1.34E-02	1.52E-02	1.64E-02	1.82E-02	1.97E-02	1.78E-02	1.32E-02	1.04E-02	9.79E-03	7.83E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.62E-03	1.75E-03	1.24E-03	9.69E-04	8.48E-04	2.17E-03	4.97E-03	9.73E-03	1.42E-02	1.32E-02	1.18E-02	1.11E-02	6.89E-03	6.27E-03	6.72E-03	7.59E-03	8.19E-03	9.08E-03	9.85E-03	8.92E-03	6.62E-03	5.20E-03	4.89E-03	3.92E-03
	Emission in each Box of 1st jet	g/s	7.49E-04	5.00E-04	3.54E-04	2.77E-04	2.42E-04	6.19E-04	1.42E-03	2.78E-03	4.05E-03	3.76E-03	3.37E-03	3.16E-03	1.97E-03	1.79E-03	1.92E-03	2.17E-03	2.34E-03	2.59E-03	2.81E-03	2.55E-03	1.89E-03	1.48E-03	1.40E-03	1.12E-03
	Emission in each Box of 2nd jet	g/s	4.37E-04	2.92E-04	2.06E-04	1.61E-04	1.41E-04	3.61E-04	8.29E-04	1.62E-03	2.36E-03	2.19E-03	1.97E-03	1.84E-03	1.15E-03	1.04E-03	1.12E-03	1.27E-03	1.36E-03	1.51E-03	1.64E-03	1.49E-03	1.10E-03	8.66E-04	8.16E-04	6.53E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0008***	***0.0018***	***0.0044***	***0.0076***	***0.0071***	***0.0063***	***0.0058***	***0.0041***	***0.0036***	***0.0040***	***0.0045***	***0.0048***	***0.0054***	***0.0059***	***0.0054***	***0.0039***	***0.0030***	***0.0028***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.42E-04	7.22E-04	5.00E-04	3.84E-04	3.33E-04	5.56E-04	1.22E-03	2.97E-03	5.10E-03	4.74E-03	4.20E-03	3.89E-03	2.71E-03	2.43E-03	2.65E-03	2.97E-03	3.21E-03	3.58E-03	3.91E-03	3.58E-03	2.60E-03	1.97E-03	1.84E-03	1.49E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.71E-04	3.61E-04	2.50E-04	1.92E-04	1.67E-04	2.78E-04	6.12E-04	1.48E-03	2.55E-03	2.37E-03	2.10E-03	1.95E-03	1.35E-03	1.22E-03	1.32E-03	1.48E-03	1.61E-03	1.79E-03	1.96E-03	1.79E-03	1.30E-03	9.84E-04	9.19E-04	7.45E-04
	Emission in each Box of 1st jet	g/s	1.35E-04	1.03E-04	7.14E-05	5.48E-05	4.76E-05	7.94E-05	1.75E-04	4.24E-04	7.28E-04	6.77E-04	6.01E-04	5.56E-04	3.87E-04	3.47E-04	3.78E-04	4.24E-04	4.59E-04	5.11E-04	5.59E-04	5.11E-04	3.71E-04	2.81E-04	2.63E-04	2.13E-04
	Emission in each Box of 2nd jet	g/s	7.85E-05	6.02E-05	4.17E-05	3.20E-05	2.78E-05	4.63E-05	1.02E-04	2.47E-04	4.25E-04	3.95E-04	3.50E-04	3.25E-04	2.26E-04	2.03E-04	2.21E-04	2.47E-04	2.68E-04	2.98E-04	3.26E-04	2.98E-04	2.17E-04	1.64E-04	1.53E-04	1.24E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2406	0.1997	0.2019	0.2134	0.2209	0.4190	0.4425	0.3859	0.3858	0.3654	0.3584	0.3502	0.3201	0.3135	0.3198	0.3413	0.3523	0.3643	0.3741	0.3569	0.3194	0.3034	0.3030	0.2783
	NO2	g/vehicle/km	0.0435	0.0416	0.0412	0.0426	0.0438	0.0540	0.0548	0.0591	0.0698	0.0662	0.0643	0.0620	0.0633	0.0612	0.0632	0.0671	0.0695	0.0722	0.0748	0.0720	0.0631	0.0578	0.0573	0.0532
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0074***	***0.0049***	***0.0034***	***0.0027***	***0.0024***	***0.0061***	***0.0138***	***0.0274***	***0.0395***	***0.0362***	***0.0326***	***0.0306***	***0.0191***	***0.0175***	***0.0189***	***0.0212***	***0.0228***	***0.0254***	***0.0275***	***0.0251***	***0.0186***	***0.0147***	***0.0136***	***0.0109***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.90E-03	3.24E-03	2.29E-03	1.81E-03	1.58E-03	4.06E-03	9.23E-03	1.82E-02	2.63E-02	2.42E-02	2.18E-02	2.04E-02	1.27E-02	1.17E-02	1.26E-02	1.41E-02	1.52E-02	1.70E-02	1.84E-02	1.68E-02	1.24E-02	9.77E-03	9.10E-03	7.27E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.45E-03	1.62E-03	1.14E-03	9.06E-04	7.91E-04	2.03E-03	4.61E-03	9.12E-03	1.32E-02	1.21E-02	1.09E-02	1.02E-02	6.36E-03	5.83E-03	6.30E-03	7.06E-03	7.60E-03	8.48E-03	9.18E-03	8.38E-03	6.20E-03	4.88E-03	4.55E-03	3.64E-03
	Emission in each Box of 1st jet	g/s	7.01E-04	4.63E-04	3.27E-04	2.59E-04	2.26E-04	5.79E-04	1.32E-03	2.60E-03	3.76E-03	3.45E-03	3.11E-03	2.92E-03	1.82E-03	1.67E-03	1.80E-03	2.02E-03	2.17E-03	2.42E-03	2.62E-03	2.39E-03	1.77E-03	1.40E-03	1.30E-03	1.04E-03
	Emission in each Box of 2nd jet	g/s	4.09E-04	2.70E-04	1.91E-04	1.51E-04	1.32E-04	3.38E-04	7.69E-04	1.52E-03	2.19E-03	2.01E-03	1.81E-03	1.70E-03	1.06E-03	9.71E-04	1.05E-03	1.18E-03	1.27E-03	1.41E-03	1.53E-03	1.40E-03	1.03E-03	8.14E-04	7.58E-04	6.06E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0017***	***0.0042***	***0.0071***	***0.0066***	***0.0059***	***0.0054***	***0.0038***	***0.0034***	***0.0037***	***0.0042***	***0.0045***	***0.0050***	***0.0055***	***0.0051***	***0.0037***	***0.0028***	***0.0026***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.87E-04	6.76E-04	4.67E-04	3.61E-04	3.13E-04	5.23E-04	1.14E-03	2.79E-03	4.76E-03	4.38E-03	3.90E-03	3.62E-03	2.51E-03	2.27E-03	2.49E-03	2.77E-03	3.00E-03	3.36E-03	3.67E-03	3.38E-03	2.45E-03	1.86E-03	1.72E-03	1.39E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.44E-04	3.38E-04	2.33E-04	1.81E-04	1.57E-04	2.61E-04	5.71E-04	1.40E-03	2.38E-03	2.19E-03	1.95E-03	1.81E-03	1.26E-03	1.14E-03	1.25E-03	1.39E-03	1.50E-03	1.68E-03	1.84E-03	1.69E-03	1.23E-03	9.30E-04	8.61E-04	6.96E-04
	Emission in each Box of 1st jet	g/s	1.27E-04	9.66E-05	6.67E-05	5.16E-05	4.48E-05	7.46E-05	1.63E-04	3.99E-04	6.80E-04	6.26E-04	5.58E-04	5.17E-04	3.59E-04	3.25E-04	3.56E-04	3.96E-04	4.28E-04	4.80E-04	5.25E-04	4.83E-04	3.50E-04	2.66E-04	2.46E-04	1.99E-04
	Emission in each Box of 2nd jet	g/s	7.39E-05	5.63E-05	3.89E-05	3.01E-05	2.61E-05	4.35E-05	9.52E-05	2.33E-04	3.97E-04	3.65E-04	3.25E-04	3.01E-04	2.10E-04	1.90E-04	2.08E-04	2.31E-04	2.50E-04	2.80E-04	3.06E-04	2.82E-04	2.04E-04	1.55E-04	1.43E-04	1.16E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2272	0.1887	0.1912	0.1992	0.2063	0.3929	0.4160	0.3635	0.3641	0.3480	0.3376	0.3343	0.3056	0.2947	0.3007	0.3247	0.3318	0.3448	0.3567	0.3373	0.3007	0.2855	0.2850	0.2624
	NO2	g/vehicle/km	0.0413	0.0396	0.0393	0.0401	0.0412	0.0509	0.0517	0.0559	0.0661	0.0633	0.0607	0.0593	0.0605	0.0577	0.0596	0.0639	0.0656	0.0685	0.0715	0.0683	0.0597	0.0546	0.0542	0.0504
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0069***	***0.0046***	***0.0033***	***0.0025***	***0.0022***	***0.0057***	***0.0130***	***0.0258***	***0.0373***	***0.0345***	***0.0307***	***0.0292***	***0.0182***	***0.0164***	***0.0178***	***0.0201***	***0.0215***	***0.0241***	***0.0263***	***0.0238***	***0.0175***	***0.0138***	***0.0128***	***0.0103***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.63E-03	3.07E-03	2.17E-03	1.69E-03	1.48E-03	3.80E-03	8.67E-03	1.72E-02	2.48E-02	2.30E-02	2.05E-02	1.95E-02	1.21E-02	1.10E-02	1.18E-02	1.34E-02	1.43E-02	1.60E-02	1.75E-02	1.58E-02	1.17E-02	9.19E-03	8.56E-03	6.86E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.32E-03	1.53E-03	1.08E-03	8.45E-04	7.39E-04	1.90E-03	4.34E-03	8.59E-03	1.24E-02	1.15E-02	1.02E-02	9.74E-03	6.07E-03	5.48E-03	5.92E-03	6.72E-03	7.16E-03	8.02E-03	8.75E-03	7.92E-03	5.84E-03	4.60E-03	4.28E-03	3.43E-03
	Emission in each Box of 1st jet	g/s	6.62E-04	4.38E-04	3.10E-04	2.42E-04	2.11E-04	5.43E-04	1.24E-03	2.45E-03	3.55E-03	3.29E-03	2.93E-03	2.78E-03	1.73E-03	1.57E-03	1.69E-03	1.92E-03	2.05E-03	2.29E-03	2.50E-03	2.26E-03	1.67E-03	1.31E-03	1.22E-03	9.80E-04
	Emission in each Box of 2nd jet	g/s	3.86E-04	2.55E-04	1.81E-04	1.41E-04	1.23E-04	3.17E-04	7.23E-04	1.43E-03	2.07E-03	1.92E-03	1.71E-03	1.62E-03	1.01E-03	9.13E-04	9.87E-04	1.12E-03	1.19E-03	1.34E-03	1.46E-03	1.32E-03	9.73E-04	7.66E-04	7.13E-04	5.72E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0007***	***0.0016***	***0.0040***	***0.0068***	***0.0063***	***0.0055***	***0.0052***	***0.0036***	***0.0032***	***0.0035***	***0.0040***	***0.0042***	***0.0048***	***0.0053***	***0.0048***	***0.0035***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.43E-04	6.43E-04	4.45E-04	3.41E-04	2.95E-04	4.93E-04	1.08E-03	2.64E-03	4.51E-03	4.18E-03	3.69E-03	3.46E-03	2.41E-03	2.14E-03	2.35E-03	2.64E-03	2.83E-03	3.19E-03	3.51E-03	3.21E-03	2.32E-03	1.76E-03	1.63E-03	1.32E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.21E-04	3.22E-04	2.23E-04	1.70E-04	1.48E-04	2.46E-04	5.39E-04	1.32E-03	2.26E-03	2.09E-03	1.84E-03	1.73E-03	1.20E-03	1.07E-03	1.17E-03	1.32E-03	1.42E-03	1.59E-03	1.75E-03	1.60E-03	1.16E-03	8.79E-04	8.13E-04	6.59E-04
	Emission in each Box of 1st jet	g/s	1.20E-04	9.19E-05	6.36E-05	4.87E-05	4.22E-05	7.04E-05	1.54E-04	3.77E-04	6.44E-04	5.98E-04	5.26E-04	4.94E-04	3.44E-04	3.06E-04	3.36E-04	3.78E-04	4.04E-04	4.56E-04	5.01E-04	4.58E-04	3.31E-04	2.51E-04	2.32E-04	1.88E-04
	Emission in each Box of 2nd jet	g/s	7.02E-05	5.36E-05	3.71E-05	2.84E-05	2.46E-05	4.10E-05	8.99E-05	2.20E-04	3.76E-04	3.49E-04	3.07E-04	2.88E-04	2.00E-04	1.79E-04	1.96E-04	2.20E-04	2.36E-04	2.66E-04	2.92E-04	2.67E-04	1.93E-04	1.47E-04	1.36E-04	1.10E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																								
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2136	0.1771	0.1787	0.1907	0.1975	0.3780	0.4004	0.3465	0.3472	0.3319	0.3215	0.3179	0.2906	0.2849	0.2907	0.3086	0.3218	0.3284	0.3398	0.3198	0.2856	0.2755	0.2739	0.2511
	NO2	g/vehicle/km	0.0391	0.0374	0.0370	0.0386	0.0397	0.0491	0.0499	0.0534	0.0632	0.0605	0.0580	0.0566	0.0577	0.0558	0.0578	0.0609	0.0637	0.0654	0.0683	0.0649	0.0569	0.0528	0.0522	0.0484
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0065***	***0.0043***	***0.0030***	***0.0024***	***0.0021***	***0.0055***	***0.0125***	***0.0246***	***0.0355***	***0.0329***	***0.0293***	***0.0278***	***0.0173***	***0.0159***	***0.0172***	***0.0191***	***0.0208***	***0.0229***	***0.0250***	***0.0225***	***0.0166***	***0.0133***	***0.0123***	***0.0098***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.35E-03	2.88E-03	2.03E-03	1.62E-03	1.41E-03	3.66E-03	8.35E-03	1.64E-02	2.37E-02	2.19E-02	1.95E-02	1.85E-02	1.15E-02	1.06E-02	1.15E-02	1.28E-02	1.39E-02	1.53E-02	1.67E-02	1.50E-02	1.11E-02	8.87E-03	8.22E-03	6.57E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.18E-03	1.44E-03	1.01E-03	8.09E-04	7.07E-04	1.83E-03	4.17E-03	8.19E-03	1.18E-02	1.10E-02	9.76E-03	9.27E-03	5.77E-03	5.30E-03	5.73E-03	6.38E-03	6.94E-03	7.64E-03	8.34E-03	7.51E-03	5.55E-03	4.44E-03	4.11E-03	3.28E-03
	Emission in each Box of 1st jet	g/s	6.22E-04	4.11E-04	2.90E-04	2.31E-04	2.02E-04	5.23E-04	1.19E-03	2.34E-03	3.38E-03	3.13E-03	2.79E-03	2.65E-03	1.65E-03	1.51E-03	1.64E-03	1.82E-03	1.98E-03	2.18E-03	2.38E-03	2.15E-03	1.58E-03	1.27E-03	1.17E-03	9.38E-04
	Emission in each Box of 2nd jet	g/s	3.63E-04	2.40E-04	1.69E-04	1.35E-04	1.18E-04	3.05E-04	6.96E-04	1.36E-03	1.97E-03	1.83E-03	1.63E-03	1.54E-03	9.62E-04	8.83E-04	9.54E-04	1.06E-03	1.16E-03	1.27E-03	1.39E-03	1.25E-03	9.25E-04	7.39E-04	6.85E-04	5.47E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0016***	***0.0038***	***0.0065***	***0.0060***	***0.0053***	***0.0049***	***0.0034***	***0.0031***	***0.0034***	***0.0038***	***0.0041***	***0.0046***	***0.0050***	***0.0046***	***0.0033***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.96E-04	6.08E-04	4.19E-04	3.28E-04	2.84E-04	4.75E-04	1.04E-03	2.52E-03	4.31E-03	4.00E-03	3.52E-03	3.30E-03	2.29E-03	2.08E-03	2.28E-03	2.52E-03	2.75E-03	3.04E-03	3.35E-03	3.05E-03	2.21E-03	1.70E-03	1.57E-03	1.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.98E-04	3.04E-04	2.10E-04	1.64E-04	1.42E-04	2.38E-04	5.20E-04	1.26E-03	2.16E-03	2.00E-03	1.76E-03	1.65E-03	1.15E-03	1.04E-03	1.14E-03	1.26E-03	1.37E-03	1.52E-03	1.68E-03	1.52E-03	1.11E-03	8.50E-04	7.83E-04	6.33E-04
	Emission in each Box of 1st jet	g/s	1.14E-04	8.69E-05	5.99E-05	4.68E-05	4.06E-05	6.79E-05	1.49E-04	3.60E-04	6.16E-04	5.71E-04	5.03E-04	4.71E-04	3.28E-04	2.97E-04	3.25E-04	3.60E-04	3.93E-04	4.35E-04	4.79E-04	4.36E-04	3.16E-04	2.43E-04	2.24E-04	1.81E-04
	Emission in each Box of 2nd jet	g/s	6.64E-05	5.07E-05	3.49E-05	2.73E-05	2.37E-05	3.96E-05	8.67E-05	2.10E-04	3.59E-04	3.33E-04	2.93E-04	2.75E-04	1.91E-04	1.73E-04	1.90E-04	2.10E-04	2.29E-04	2.54E-04	2.79E-04	2.54E-04	1.84E-04	1.42E-04	1.31E-04	1.05E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1922	0.1582	0.1601	0.1664	0.1724	0.3303	0.3457	0.3014	0.3060	0.2910	0.2867	0.2828	0.2604	0.2541	0.2611	0.2759	0.2869	0.2971	0.2999	0.2875	0.2562	0.2403	0.2408	0.2203
	NO2	g/vehicle/km	0.0354	0.0337	0.0334	0.0341	0.0350	0.0432	0.0434	0.0468	0.0560	0.0533	0.0519	0.0506	0.0519	0.0500	0.0521	0.0547	0.0571	0.0594	0.0606	0.0586	0.0512	0.0464	0.0461	0.0427
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0059***	***0.0039***	***0.0027***	***0.0021***	***0.0019***	***0.0048***	***0.0108***	***0.0214***	***0.0313***	***0.0289***	***0.0261***	***0.0247***	***0.0155***	***0.0142***	***0.0154***	***0.0171***	***0.0186***	***0.0207***	***0.0221***	***0.0202***	***0.0149***	***0.0116***	***0.0108***	***0.0086***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.92E-03	2.57E-03	1.82E-03	1.41E-03	1.24E-03	3.20E-03	7.21E-03	1.42E-02	2.09E-02	1.92E-02	1.74E-02	1.65E-02	1.03E-02	9.45E-03	1.03E-02	1.14E-02	1.24E-02	1.38E-02	1.47E-02	1.35E-02	9.95E-03	7.74E-03	7.23E-03	5.76E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.96E-03	1.28E-03	9.08E-04	7.06E-04	6.18E-04	1.60E-03	3.60E-03	7.12E-03	1.04E-02	9.62E-03	8.71E-03	8.24E-03	5.17E-03	4.73E-03	5.14E-03	5.71E-03	6.19E-03	6.91E-03	7.36E-03	6.75E-03	4.98E-03	3.87E-03	3.61E-03	2.88E-03
	Emission in each Box of 1st jet	g/s	5.60E-04	3.67E-04	2.59E-04	2.02E-04	1.76E-04	4.57E-04	1.03E-03	2.03E-03	2.98E-03	2.75E-03	2.49E-03	2.36E-03	1.48E-03	1.35E-03	1.47E-03	1.63E-03	1.77E-03	1.97E-03	2.10E-03	1.93E-03	1.42E-03	1.11E-03	1.03E-03	8.23E-04
	Emission in each Box of 2nd jet	g/s	3.26E-04	2.14E-04	1.51E-04	1.18E-04	1.03E-04	2.66E-04	6.01E-04	1.19E-03	1.74E-03	1.60E-03	1.45E-03	1.37E-03	8.62E-04	7.88E-04	8.57E-04	9.51E-04	1.03E-03	1.15E-03	1.23E-03	1.12E-03	8.29E-04	6.45E-04	6.02E-04	4.80E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0033***	***0.0057***	***0.0053***	***0.0047***	***0.0044***	***0.0031***	***0.0028***	***0.0031***	***0.0034***	***0.0037***	***0.0041***	***0.0045***	***0.0041***	***0.0030***	***0.0022***	***0.0021***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.21E-04	5.48E-04	3.79E-04	2.89E-04	2.51E-04	4.18E-04	9.04E-04	2.21E-03	3.82E-03	3.52E-03	3.15E-03	2.95E-03	2.06E-03	1.86E-03	2.05E-03	2.26E-03	2.46E-03	2.76E-03	2.97E-03	2.75E-03	1.99E-03	1.49E-03	1.39E-03	1.12E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.61E-04	2.74E-04	1.90E-04	1.44E-04	1.25E-04	2.09E-04	4.52E-04	1.10E-03	1.91E-03	1.76E-03	1.58E-03	1.47E-03	1.03E-03	9.30E-04	1.03E-03	1.13E-03	1.23E-03	1.38E-03	1.49E-03	1.38E-03	9.95E-04	7.47E-04	6.93E-04	5.59E-04
	Emission in each Box of 1st jet	g/s	1.03E-04	7.82E-05	5.42E-05	4.13E-05	3.58E-05	5.97E-05	1.29E-04	3.16E-04	5.45E-04	5.03E-04	4.50E-04	4.21E-04	2.95E-04	2.66E-04	2.93E-04	3.23E-04	3.52E-04	3.95E-04	4.25E-04	3.93E-04	2.84E-04	2.13E-04	1.98E-04	1.60E-04
	Emission in each Box of 2nd jet	g/s	6.01E-05	4.56E-05	3.16E-05	2.41E-05	2.09E-05	3.48E-05	7.54E-05	1.84E-04	3.18E-04	2.94E-04	2.63E-04	2.46E-04	1.72E-04	1.55E-04	1.71E-04	1.88E-04	2.05E-04	2.30E-04	2.48E-04	2.29E-04	1.66E-04	1.24E-04	1.15E-04	9.31E-05
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1856	0.1535	0.1593	0.1655	0.1705	0.3267	0.3377	0.2978	0.2995	0.2905	0.2778	0.2740	0.2506	0.2462	0.2495	0.2674	0.2823	0.2901	0.2946	0.2843	0.2532	0.2390	0.2380	0.2190
	NO2	g/vehicle/km	0.0342	0.0327	0.0332	0.0339	0.0346	0.0427	0.0424	0.0463	0.0549	0.0533	0.0504	0.0490	0.0501	0.0485	0.0499	0.0531	0.0562	0.0581	0.0595	0.0580	0.0507	0.0461	0.0457	0.0425
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0057***	***0.0037***	***0.0027***	***0.0021***	***0.0018***	***0.0047***	***0.0106***	***0.0211***	***0.0307***	***0.0288***	***0.0253***	***0.0240***	***0.0149***	***0.0137***	***0.0147***	***0.0166***	***0.0183***	***0.0202***	***0.0217***	***0.0200***	***0.0148***	***0.0115***	***0.0107***	***0.0086***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.78E-03	2.49E-03	1.81E-03	1.40E-03	1.22E-03	3.16E-03	7.04E-03	1.41E-02	2.04E-02	1.92E-02	1.69E-02	1.60E-02	9.96E-03	9.15E-03	9.83E-03	1.11E-02	1.22E-02	1.35E-02	1.45E-02	1.33E-02	9.84E-03	7.69E-03	7.15E-03	5.73E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.89E-03	1.25E-03	9.03E-04	7.02E-04	6.11E-04	1.58E-03	3.52E-03	7.04E-03	1.02E-02	9.60E-03	8.43E-03	7.99E-03	4.98E-03	4.58E-03	4.92E-03	5.53E-03	6.09E-03	6.75E-03	7.23E-03	6.67E-03	4.92E-03	3.85E-03	3.57E-03	2.86E-03
	Emission in each Box of 1st jet	g/s	5.40E-04	3.56E-04	2.58E-04	2.01E-04	1.74E-04	4.52E-04	1.01E-03	2.01E-03	2.92E-03	2.74E-03	2.41E-03	2.28E-03	1.42E-03	1.31E-03	1.40E-03	1.58E-03	1.74E-03	1.93E-03	2.07E-03	1.91E-03	1.41E-03	1.10E-03	1.02E-03	8.18E-04
	Emission in each Box of 2nd jet	g/s	3.15E-04	2.08E-04	1.51E-04	1.17E-04	1.02E-04	2.64E-04	5.87E-04	1.17E-03	1.70E-03	1.60E-03	1.41E-03	1.33E-03	8.30E-04	7.63E-04	8.19E-04	9.22E-04	1.02E-03	1.12E-03	1.20E-03	1.11E-03	8.20E-04	6.41E-04	5.95E-04	4.77E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0013***	***0.0033***	***0.0056***	***0.0053***	***0.0046***	***0.0043***	***0.0030***	***0.0027***	***0.0029***	***0.0033***	***0.0036***	***0.0041***	***0.0044***	***0.0041***	***0.0030***	***0.0022***	***0.0021***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.97E-04	5.32E-04	3.77E-04	2.88E-04	2.48E-04	4.14E-04	8.85E-04	2.19E-03	3.74E-03	3.52E-03	3.06E-03	2.86E-03	1.99E-03	1.80E-03	1.97E-03	2.19E-03	2.43E-03	2.70E-03	2.92E-03	2.72E-03	1.97E-03	1.49E-03	1.37E-03	1.11E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.48E-04	2.66E-04	1.88E-04	1.44E-04	1.24E-04	2.07E-04	4.43E-04	1.09E-03	1.87E-03	1.76E-03	1.53E-03	1.43E-03	9.95E-04	9.02E-04	9.83E-04	1.10E-03	1.21E-03	1.35E-03	1.46E-03	1.36E-03	9.84E-04	7.43E-04	6.85E-04	5.56E-04
	Emission in each Box of 1st jet	g/s	9.95E-05	7.60E-05	5.38E-05	4.11E-05	3.54E-05	5.91E-05	1.26E-04	3.12E-04	5.35E-04	5.03E-04	4.37E-04	4.08E-04	2.84E-04	2.58E-04	2.81E-04	3.14E-04	3.47E-04	3.86E-04	4.17E-04	3.89E-04	2.81E-04	2.12E-04	1.96E-04	1.59E-04
	Emission in each Box of 2nd jet	g/s	5.81E-05	4.43E-05	3.14E-05	2.40E-05	2.07E-05	3.45E-05	7.38E-05	1.82E-04	3.12E-04	2.93E-04	2.55E-04	2.38E-04	1.66E-04	1.50E-04	1.64E-04	1.83E-04	2.02E-04	2.25E-04	2.44E-04	2.27E-04	1.64E-04	1.24E-04	1.14E-04	9.26E-05
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1867	0.1526	0.1544	0.1603	0.1661	0.3167	0.3377	0.2905	0.2923	0.2811	0.2789	0.2771	0.2460	0.2419	0.2524	0.2686	0.2773	0.2891	0.2913	0.2811	0.2488	0.2361	0.2350	0.2136
	NO2	g/vehicle/km	0.0344	0.0326	0.0323	0.0329	0.0338	0.0415	0.0424	0.0452	0.0536	0.0515	0.0506	0.0496	0.0492	0.0477	0.0504	0.0532	0.0552	0.0578	0.0589	0.0574	0.0498	0.0456	0.0451	0.0415
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0057***	***0.0037***	***0.0026***	***0.0020***	***0.0018***	***0.0046***	***0.0106***	***0.0206***	***0.0299***	***0.0279***	***0.0254***	***0.0242***	***0.0147***	***0.0135***	***0.0149***	***0.0167***	***0.0179***	***0.0202***	***0.0214***	***0.0198***	***0.0145***	***0.0114***	***0.0106***	***0.0084***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.81E-03	2.48E-03	1.75E-03	1.36E-03	1.19E-03	3.07E-03	7.04E-03	1.37E-02	1.99E-02	1.86E-02	1.69E-02	1.62E-02	9.78E-03	9.00E-03	9.94E-03	1.11E-02	1.20E-02	1.34E-02	1.43E-02	1.32E-02	9.66E-03	7.60E-03	7.05E-03	5.58E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.90E-03	1.24E-03	8.76E-04	6.80E-04	5.95E-04	1.53E-03	3.52E-03	6.86E-03	9.97E-03	9.29E-03	8.47E-03	8.08E-03	4.89E-03	4.50E-03	4.97E-03	5.55E-03	5.98E-03	6.72E-03	7.15E-03	6.60E-03	4.83E-03	3.80E-03	3.53E-03	2.79E-03
	Emission in each Box of 1st jet	g/s	5.44E-04	3.54E-04	2.50E-04	1.94E-04	1.70E-04	4.38E-04	1.01E-03	1.96E-03	2.85E-03	2.65E-03	2.42E-03	2.31E-03	1.40E-03	1.29E-03	1.42E-03	1.59E-03	1.71E-03	1.92E-03	2.04E-03	1.89E-03	1.38E-03	1.09E-03	1.01E-03	7.98E-04
	Emission in each Box of 2nd jet	g/s	3.17E-04	2.07E-04	1.46E-04	1.13E-04	9.92E-05	2.55E-04	5.87E-04	1.14E-03	1.66E-03	1.55E-03	1.41E-03	1.35E-03	8.15E-04	7.50E-04	8.29E-04	9.26E-04	9.97E-04	1.12E-03	1.19E-03	1.10E-03	8.05E-04	6.33E-04	5.88E-04	4.65E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0013***	***0.0032***	***0.0055***	***0.0051***	***0.0046***	***0.0043***	***0.0029***	***0.0027***	***0.0030***	***0.0033***	***0.0036***	***0.0040***	***0.0043***	***0.0040***	***0.0029***	***0.0022***	***0.0020***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.01E-04	5.29E-04	3.66E-04	2.79E-04	2.42E-04	4.02E-04	8.85E-04	2.13E-03	3.66E-03	3.41E-03	3.07E-03	2.89E-03	1.95E-03	1.77E-03	1.99E-03	2.20E-03	2.38E-03	2.69E-03	2.89E-03	2.69E-03	1.94E-03	1.47E-03	1.35E-03	1.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.50E-04	2.64E-04	1.83E-04	1.40E-04	1.21E-04	2.01E-04	4.43E-04	1.07E-03	1.83E-03	1.70E-03	1.54E-03	1.45E-03	9.77E-04	8.87E-04	9.93E-04	1.10E-03	1.19E-03	1.35E-03	1.45E-03	1.35E-03	9.68E-04	7.34E-04	6.77E-04	5.43E-04
	Emission in each Box of 1st jet	g/s	1.00E-04	7.56E-05	5.23E-05	3.99E-05	3.46E-05	5.74E-05	1.26E-04	3.05E-04	5.22E-04	4.87E-04	4.39E-04	4.13E-04	2.79E-04	2.53E-04	2.84E-04	3.15E-04	3.40E-04	3.84E-04	4.13E-04	3.85E-04	2.77E-04	2.10E-04	1.94E-04	1.55E-04
	Emission in each Box of 2nd jet	g/s	5.84E-05	4.41E-05	3.05E-05	2.33E-05	2.02E-05	3.35E-05	7.38E-05	1.78E-04	3.05E-04	2.84E-04	2.56E-04	2.41E-04	1.63E-04	1.48E-04	1.65E-04	1.84E-04	1.99E-04	2.24E-04	2.41E-04	2.24E-04	1.61E-04	1.22E-04	1.13E-04	9.05E-05
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1891	0.1556	0.1575	0.1636	0.1695	0.3233	0.3444	0.2978	0.2958	0.2820	0.2833	0.2776	0.2506	0.2462	0.2512	0.2674	0.2840	0.2883	0.2997	0.2810	0.2489	0.2362	0.2352	0.2165
	NO2	g/vehicle/km	0.0348	0.0332	0.0329	0.0335	0.0345	0.0423	0.0432	0.0463	0.0542	0.0517	0.0514	0.0496	0.0501	0.0485	0.0502	0.0531	0.0566	0.0577	0.0605	0.0574	0.0499	0.0456	0.0452	0.0420
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0058***	***0.0038***	***0.0027***	***0.0021***	***0.0018***	***0.0047***	***0.0108***	***0.0211***	***0.0303***	***0.0280***	***0.0258***	***0.0243***	***0.0149***	***0.0137***	***0.0148***	***0.0166***	***0.0184***	***0.0201***	***0.0221***	***0.0198***	***0.0145***	***0.0114***	***0.0106***	***0.0085***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.85E-03	2.53E-03	1.79E-03	1.39E-03	1.21E-03	3.13E-03	7.18E-03	1.41E-02	2.02E-02	1.86E-02	1.72E-02	1.62E-02	9.96E-03	9.15E-03	9.90E-03	1.11E-02	1.23E-02	1.34E-02	1.47E-02	1.32E-02	9.67E-03	7.61E-03	7.06E-03	5.66E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.93E-03	1.26E-03	8.93E-04	6.94E-04	6.07E-04	1.56E-03	3.59E-03	7.04E-03	1.01E-02	9.32E-03	8.60E-03	8.09E-03	4.98E-03	4.58E-03	4.95E-03	5.53E-03	6.13E-03	6.71E-03	7.35E-03	6.60E-03	4.83E-03	3.80E-03	3.53E-03	2.83E-03
	Emission in each Box of 1st jet	g/s	5.51E-04	3.61E-04	2.55E-04	1.98E-04	1.73E-04	4.47E-04	1.03E-03	2.01E-03	2.88E-03	2.66E-03	2.46E-03	2.31E-03	1.42E-03	1.31E-03	1.41E-03	1.58E-03	1.75E-03	1.92E-03	2.10E-03	1.88E-03	1.38E-03	1.09E-03	1.01E-03	8.09E-04
	Emission in each Box of 2nd jet	g/s	3.21E-04	2.11E-04	1.49E-04	1.16E-04	1.01E-04	2.61E-04	5.99E-04	1.17E-03	1.68E-03	1.55E-03	1.43E-03	1.35E-03	8.30E-04	7.63E-04	8.25E-04	9.22E-04	1.02E-03	1.12E-03	1.23E-03	1.10E-03	8.06E-04	6.34E-04	5.88E-04	4.72E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0033***	***0.0055***	***0.0051***	***0.0047***	***0.0043***	***0.0030***	***0.0027***	***0.0030***	***0.0033***	***0.0037***	***0.0040***	***0.0045***	***0.0040***	***0.0029***	***0.0022***	***0.0020***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.09E-04	5.39E-04	3.73E-04	2.85E-04	2.47E-04	4.09E-04	9.02E-04	2.19E-03	3.70E-03	3.42E-03	3.12E-03	2.89E-03	1.99E-03	1.80E-03	1.98E-03	2.19E-03	2.44E-03	2.69E-03	2.97E-03	2.69E-03	1.94E-03	1.47E-03	1.36E-03	1.10E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.55E-04	2.69E-04	1.86E-04	1.42E-04	1.23E-04	2.05E-04	4.51E-04	1.09E-03	1.85E-03	1.71E-03	1.56E-03	1.45E-03	9.95E-04	9.02E-04	9.89E-04	1.10E-03	1.22E-03	1.34E-03	1.49E-03	1.35E-03	9.69E-04	7.35E-04	6.78E-04	5.50E-04
	Emission in each Box of 1st jet	g/s	1.01E-04	7.70E-05	5.33E-05	4.07E-05	3.53E-05	5.85E-05	1.29E-04	3.12E-04	5.28E-04	4.88E-04	4.46E-04	4.13E-04	2.84E-04	2.58E-04	2.82E-04	3.14E-04	3.49E-04	3.84E-04	4.25E-04	3.85E-04	2.77E-04	2.10E-04	1.94E-04	1.57E-04
	Emission in each Box of 2nd jet	g/s	5.91E-05	4.49E-05	3.11E-05	2.37E-05	2.06E-05	3.41E-05	7.52E-05	1.82E-04	3.08E-04	2.85E-04	2.60E-04	2.41E-04	1.66E-04	1.50E-04	1.65E-04	1.83E-04	2.03E-04	2.24E-04	2.48E-04	2.24E-04	1.61E-04	1.22E-04	1.13E-04	9.16E-05
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1878	0.1544	0.1563	0.1613	0.1724	0.3285	0.3482	0.2941	0.2982	0.2850	0.2867	0.2771	0.2534	0.2525	0.2558	0.2741	0.2811	0.2872	0.2982	0.2777	0.2562	0.2417	0.2408	0.2216
	NO2	g/vehicle/km	0.0345	0.0329	0.0326	0.0331	0.0350	0.0430	0.0437	0.0457	0.0546	0.0523	0.0519	0.0496	0.0506	0.0497	0.0511	0.0543	0.0559	0.0575	0.0602	0.0567	0.0512	0.0466	0.0461	0.0430
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0057***	***0.0038***	***0.0027***	***0.0021***	***0.0019***	***0.0048***	***0.0109***	***0.0208***	***0.0305***	***0.0283***	***0.0261***	***0.0242***	***0.0151***	***0.0141***	***0.0151***	***0.0170***	***0.0182***	***0.0200***	***0.0220***	***0.0196***	***0.0149***	***0.0117***	***0.0108***	***0.0087***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.83E-03	2.51E-03	1.77E-03	1.37E-03	1.24E-03	3.18E-03	7.26E-03	1.39E-02	2.03E-02	1.88E-02	1.74E-02	1.62E-02	1.01E-02	9.39E-03	1.01E-02	1.13E-02	1.21E-02	1.34E-02	1.46E-02	1.30E-02	9.95E-03	7.78E-03	7.23E-03	5.79E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.91E-03	1.25E-03	8.86E-04	6.85E-04	6.18E-04	1.59E-03	3.63E-03	6.95E-03	1.02E-02	9.42E-03	8.71E-03	8.08E-03	5.04E-03	4.69E-03	5.04E-03	5.67E-03	6.07E-03	6.68E-03	7.32E-03	6.52E-03	4.98E-03	3.89E-03	3.61E-03	2.90E-03
	Emission in each Box of 1st jet	g/s	5.47E-04	3.58E-04	2.53E-04	1.96E-04	1.76E-04	4.54E-04	1.04E-03	1.99E-03	2.91E-03	2.69E-03	2.49E-03	2.31E-03	1.44E-03	1.34E-03	1.44E-03	1.62E-03	1.73E-03	1.91E-03	2.09E-03	1.86E-03	1.42E-03	1.11E-03	1.03E-03	8.28E-04
	Emission in each Box of 2nd jet	g/s	3.19E-04	2.09E-04	1.48E-04	1.14E-04	1.03E-04	2.65E-04	6.05E-04	1.16E-03	1.70E-03	1.57E-03	1.45E-03	1.35E-03	8.39E-04	7.82E-04	8.40E-04	9.45E-04	1.01E-03	1.11E-03	1.22E-03	1.09E-03	8.29E-04	6.49E-04	6.02E-04	4.83E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0032***	***0.0056***	***0.0052***	***0.0047***	***0.0043***	***0.0030***	***0.0028***	***0.0030***	***0.0034***	***0.0036***	***0.0040***	***0.0044***	***0.0040***	***0.0030***	***0.0023***	***0.0021***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.04E-04	5.35E-04	3.70E-04	2.81E-04	2.51E-04	4.16E-04	9.11E-04	2.16E-03	3.73E-03	3.46E-03	3.15E-03	2.89E-03	2.01E-03	1.85E-03	2.01E-03	2.25E-03	2.41E-03	2.68E-03	2.96E-03	2.66E-03	1.99E-03	1.50E-03	1.39E-03	1.12E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.52E-04	2.67E-04	1.85E-04	1.40E-04	1.25E-04	2.08E-04	4.55E-04	1.08E-03	1.86E-03	1.73E-03	1.58E-03	1.44E-03	1.01E-03	9.25E-04	1.01E-03	1.12E-03	1.21E-03	1.34E-03	1.48E-03	1.33E-03	9.95E-04	7.51E-04	6.93E-04	5.62E-04
	Emission in each Box of 1st jet	g/s	1.01E-04	7.64E-05	5.29E-05	4.01E-05	3.58E-05	5.94E-05	1.30E-04	3.09E-04	5.33E-04	4.94E-04	4.50E-04	4.13E-04	2.87E-04	2.64E-04	2.88E-04	3.21E-04	3.45E-04	3.82E-04	4.22E-04	3.80E-04	2.84E-04	2.14E-04	1.98E-04	1.61E-04
	Emission in each Box of 2nd jet	g/s	5.87E-05	4.46E-05	3.08E-05	2.34E-05	2.09E-05	3.47E-05	7.59E-05	1.80E-04	3.11E-04	2.88E-04	2.63E-04	2.41E-04	1.68E-04	1.54E-04	1.68E-04	1.87E-04	2.01E-04	2.23E-04	2.46E-04	2.22E-04	1.66E-04	1.25E-04	1.15E-04	9.36E-05
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2116	0.1755	0.1769	0.1842	0.1900	0.3629	0.3860	0.3371	0.3376	0.3226	0.3121	0.3088	0.2838	0.2770	0.2826	0.3012	0.3129	0.3190	0.3332	0.3148	0.2822	0.2679	0.2672	0.2448
	NO2	g/vehicle/km	0.0387	0.0371	0.0366	0.0374	0.0383	0.0472	0.0482	0.0521	0.0615	0.0589	0.0564	0.0550	0.0564	0.0543	0.0562	0.0595	0.0621	0.0636	0.0670	0.0639	0.0562	0.0514	0.0510	0.0473
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0065***	***0.0043***	***0.0030***	***0.0023***	***0.0020***	***0.0053***	***0.0121***	***0.0239***	***0.0346***	***0.0320***	***0.0284***	***0.0270***	***0.0169***	***0.0155***	***0.0167***	***0.0187***	***0.0203***	***0.0223***	***0.0245***	***0.0222***	***0.0164***	***0.0129***	***0.0120***	***0.0096***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.31E-03	2.85E-03	2.01E-03	1.56E-03	1.36E-03	3.51E-03	8.05E-03	1.59E-02	2.30E-02	2.13E-02	1.90E-02	1.80E-02	1.13E-02	1.03E-02	1.11E-02	1.25E-02	1.35E-02	1.48E-02	1.64E-02	1.48E-02	1.10E-02	8.63E-03	8.02E-03	6.40E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.16E-03	1.43E-03	1.00E-03	7.82E-04	6.80E-04	1.76E-03	4.02E-03	7.96E-03	1.15E-02	1.07E-02	9.48E-03	9.00E-03	5.64E-03	5.15E-03	5.57E-03	6.23E-03	6.75E-03	7.42E-03	8.18E-03	7.39E-03	5.48E-03	4.31E-03	4.01E-03	3.20E-03
	Emission in each Box of 1st jet	g/s	6.16E-04	4.07E-04	2.87E-04	2.23E-04	1.94E-04	5.02E-04	1.15E-03	2.28E-03	3.29E-03	3.05E-03	2.71E-03	2.57E-03	1.61E-03	1.47E-03	1.59E-03	1.78E-03	1.93E-03	2.12E-03	2.34E-03	2.11E-03	1.57E-03	1.23E-03	1.15E-03	9.14E-04
	Emission in each Box of 2nd jet	g/s	3.60E-04	2.38E-04	1.67E-04	1.30E-04	1.13E-04	2.93E-04	6.71E-04	1.33E-03	1.92E-03	1.78E-03	1.58E-03	1.50E-03	9.40E-04	8.58E-04	9.28E-04	1.04E-03	1.13E-03	1.24E-03	1.36E-03	1.23E-03	9.14E-04	7.19E-04	6.68E-04	5.33E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0037***	***0.0063***	***0.0058***	***0.0051***	***0.0048***	***0.0034***	***0.0030***	***0.0033***	***0.0037***	***0.0040***	***0.0044***	***0.0049***	***0.0045***	***0.0033***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.89E-04	6.02E-04	4.15E-04	3.17E-04	2.74E-04	4.57E-04	1.00E-03	2.46E-03	4.20E-03	3.89E-03	3.42E-03	3.21E-03	2.24E-03	2.02E-03	2.21E-03	2.46E-03	2.68E-03	2.96E-03	3.29E-03	3.00E-03	2.18E-03	1.66E-03	1.53E-03	1.24E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.94E-04	3.01E-04	2.08E-04	1.59E-04	1.37E-04	2.29E-04	5.02E-04	1.23E-03	2.10E-03	1.95E-03	1.71E-03	1.60E-03	1.12E-03	1.01E-03	1.11E-03	1.23E-03	1.34E-03	1.48E-03	1.64E-03	1.50E-03	1.09E-03	8.28E-04	7.65E-04	6.18E-04
	Emission in each Box of 1st jet	g/s	1.13E-04	8.60E-05	5.93E-05	4.53E-05	3.92E-05	6.53E-05	1.44E-04	3.51E-04	6.00E-04	5.56E-04	4.89E-04	4.58E-04	3.20E-04	2.89E-04	3.16E-04	3.52E-04	3.83E-04	4.23E-04	4.70E-04	4.29E-04	3.12E-04	2.37E-04	2.19E-04	1.77E-04
	Emission in each Box of 2nd jet	g/s	6.57E-05	5.02E-05	3.46E-05	2.64E-05	2.28E-05	3.81E-05	8.37E-05	2.05E-04	3.50E-04	3.24E-04	2.85E-04	2.67E-04	1.87E-04	1.68E-04	1.84E-04	2.05E-04	2.23E-04	2.47E-04	2.74E-04	2.50E-04	1.82E-04	1.38E-04	1.28E-04	1.03E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2319	0.1948	0.1968	0.2069	0.2143	0.4087	0.4339	0.3779	0.3798	0.3640	0.3522	0.3464	0.3139	0.3065	0.3126	0.3335	0.3446	0.3573	0.3660	0.3508	0.3128	0.2971	0.2965	0.2730
	NO2	g/vehicle/km	0.0422	0.0408	0.0404	0.0416	0.0427	0.0529	0.0539	0.0581	0.0688	0.0660	0.0633	0.0614	0.0621	0.0599	0.0619	0.0656	0.0681	0.0709	0.0733	0.0709	0.0620	0.0567	0.0563	0.0524
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0071***	***0.0047***	***0.0033***	***0.0026***	***0.0023***	***0.0059***	***0.0136***	***0.0268***	***0.0389***	***0.0361***	***0.0321***	***0.0303***	***0.0187***	***0.0171***	***0.0185***	***0.0207***	***0.0223***	***0.0249***	***0.0269***	***0.0247***	***0.0182***	***0.0143***	***0.0134***	***0.0107***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.73E-03	3.16E-03	2.23E-03	1.76E-03	1.54E-03	3.96E-03	9.05E-03	1.79E-02	2.59E-02	2.41E-02	2.14E-02	2.02E-02	1.25E-02	1.14E-02	1.23E-02	1.38E-02	1.49E-02	1.66E-02	1.80E-02	1.65E-02	1.22E-02	9.56E-03	8.90E-03	7.14E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.36E-03	1.58E-03	1.12E-03	8.78E-04	7.68E-04	1.98E-03	4.52E-03	8.93E-03	1.30E-02	1.20E-02	1.07E-02	1.01E-02	6.24E-03	5.70E-03	6.16E-03	6.90E-03	7.44E-03	8.31E-03	8.98E-03	8.24E-03	6.08E-03	4.78E-03	4.45E-03	3.57E-03
	Emission in each Box of 1st jet	g/s	6.75E-04	4.52E-04	3.19E-04	2.51E-04	2.19E-04	5.65E-04	1.29E-03	2.55E-03	3.70E-03	3.44E-03	3.06E-03	2.89E-03	1.78E-03	1.63E-03	1.76E-03	1.97E-03	2.12E-03	2.37E-03	2.57E-03	2.35E-03	1.74E-03	1.37E-03	1.27E-03	1.02E-03
	Emission in each Box of 2nd jet	g/s	3.94E-04	2.64E-04	1.86E-04	1.46E-04	1.28E-04	3.30E-04	7.54E-04	1.49E-03	2.16E-03	2.00E-03	1.78E-03	1.68E-03	1.04E-03	9.50E-04	1.03E-03	1.15E-03	1.24E-03	1.39E-03	1.50E-03	1.37E-03	1.01E-03	7.97E-04	7.42E-04	5.95E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0017***	***0.0041***	***0.0070***	***0.0065***	***0.0058***	***0.0054***	***0.0037***	***0.0033***	***0.0037***	***0.0041***	***0.0044***	***0.0049***	***0.0054***	***0.0050***	***0.0036***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.59E-04	6.63E-04	4.58E-04	3.53E-04	3.06E-04	5.12E-04	1.12E-03	2.74E-03	4.69E-03	4.37E-03	3.84E-03	3.58E-03	2.47E-03	2.23E-03	2.44E-03	2.71E-03	2.94E-03	3.30E-03	3.60E-03	3.33E-03	2.41E-03	1.83E-03	1.69E-03	1.37E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.30E-04	3.32E-04	2.29E-04	1.77E-04	1.53E-04	2.56E-04	5.62E-04	1.37E-03	2.35E-03	2.18E-03	1.92E-03	1.79E-03	1.23E-03	1.11E-03	1.22E-03	1.36E-03	1.47E-03	1.65E-03	1.80E-03	1.66E-03	1.20E-03	9.13E-04	8.45E-04	6.85E-04
	Emission in each Box of 1st jet	g/s	1.23E-04	9.47E-05	6.54E-05	5.04E-05	4.37E-05	7.31E-05	1.61E-04	3.92E-04	6.71E-04	6.24E-04	5.49E-04	5.11E-04	3.53E-04	3.18E-04	3.49E-04	3.88E-04	4.20E-04	4.71E-04	5.14E-04	4.75E-04	3.44E-04	2.61E-04	2.41E-04	1.96E-04
	Emission in each Box of 2nd jet	g/s	7.16E-05	5.53E-05	3.82E-05	2.94E-05	2.55E-05	4.26E-05	9.37E-05	2.29E-04	3.91E-04	3.64E-04	3.20E-04	2.98E-04	2.06E-04	1.86E-04	2.03E-04	2.26E-04	2.45E-04	2.75E-04	3.00E-04	2.77E-04	2.01E-04	1.52E-04	1.41E-04	1.14E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1424	1367	932	872	924	970	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2444	0.2039	0.2062	0.2155	0.2257	0.4278	0.4527	0.3940	0.3956	0.3787	0.3656	0.3602	0.3257	0.3180	0.3253	0.3463	0.3575	0.3697	0.3824	0.3621	0.3241	0.3070	0.3103	0.2857
	NO2	g/vehicle/km	0.0442	0.0424	0.0420	0.0430	0.0447	0.0551	0.0560	0.0603	0.0714	0.0685	0.0655	0.0637	0.0643	0.0620	0.0642	0.0680	0.0704	0.0732	0.0763	0.0730	0.0640	0.0584	0.0586	0.0546
	RSP	g/vehicle/km	0.0142	0.0113	0.0114	0.0121	0.0127	0.0261	0.0278	0.0220	0.0197	0.0190	0.0189	0.0188	0.0171	0.0169	0.0170	0.0175	0.0179	0.0183	0.0185	0.0177	0.0170	0.0168	0.0168	0.0157
	FSP	g/vehicle/km	0.0130	0.0104	0.0105	0.0112	0.0117	0.0240	0.0256	0.0202	0.0181	0.0175	0.0173	0.0172	0.0157	0.0155	0.0156	0.0161	0.0164	0.0168	0.0170	0.0163	0.0156	0.0155	0.0155	0.0145
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0075***	***0.0050***	***0.0035***	***0.0027***	***0.0024***	***0.0062***	***0.0142***	***0.0279***	***0.0405***	***0.0375***	***0.0333***	***0.0315***	***0.0194***	***0.0177***	***0.0192***	***0.0215***	***0.0231***	***0.0258***	***0.0282***	***0.0255***	***0.0189***	***0.0148***	***0.0140***	***0.0112***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.98E-03	3.31E-03	2.34E-03	1.83E-03	1.62E-03	4.14E-03	9.44E-03	1.86E-02	2.70E-02	2.50E-02	2.22E-02	2.10E-02	1.29E-02	1.18E-02	1.28E-02	1.43E-02	1.54E-02	1.72E-02	1.88E-02	1.70E-02	1.26E-02	9.89E-03	9.32E-03	7.47E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.49E-03	1.66E-03	1.17E-03	9.14E-04	8.09E-04	2.07E-03	4.72E-03	9.31E-03	1.35E-02	1.25E-02	1.11E-02	1.05E-02	6.47E-03	5.91E-03	6.41E-03	7.16E-03	7.71E-03	8.60E-03	9.39E-03	8.50E-03	6.30E-03	4.94E-03	4.66E-03	3.73E-03
	Emission in each Box of 1st jet	g/s	7.12E-04	4.73E-04	3.34E-04	2.61E-04	2.31E-04	5.92E-04	1.35E-03	2.66E-03	3.86E-03	3.58E-03	3.17E-03	3.00E-03	1.85E-03	1.69E-03	1.83E-03	2.05E-03	2.20E-03	2.46E-03	2.68E-03	2.43E-03	1.80E-03	1.41E-03	1.33E-03	1.07E-03
	Emission in each Box of 2nd jet	g/s	4.15E-04	2.76E-04	1.95E-04	1.52E-04	1.35E-04	3.45E-04	7.87E-04	1.55E-03	2.25E-03	2.09E-03	1.85E-03	1.75E-03	1.08E-03	9.85E-04	1.07E-03	1.19E-03	1.29E-03	1.43E-03	1.56E-03	1.42E-03	1.05E-03	8.24E-04	7.76E-04	6.22E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0043***	***0.0073***	***0.0068***	***0.0060***	***0.0056***	***0.0038***	***0.0035***	***0.0038***	***0.0042***	***0.0046***	***0.0051***	***0.0056***	***0.0051***	***0.0037***	***0.0028***	***0.0026***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.01E-04	6.89E-04	4.76E-04	3.65E-04	3.20E-04	5.33E-04	1.17E-03	2.85E-03	4.87E-03	4.53E-03	3.97E-03	3.71E-03	2.56E-03	2.30E-03	2.53E-03	2.81E-03	3.04E-03	3.41E-03	3.75E-03	3.43E-03	2.49E-03	1.88E-03	1.76E-03	1.43E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.50E-04	3.44E-04	2.38E-04	1.83E-04	1.60E-04	2.67E-04	5.84E-04	1.42E-03	2.43E-03	2.26E-03	1.99E-03	1.86E-03	1.28E-03	1.15E-03	1.27E-03	1.41E-03	1.52E-03	1.70E-03	1.87E-03	1.71E-03	1.24E-03	9.41E-04	8.80E-04	7.13E-04
	Emission in each Box of 1st jet	g/s	1.29E-04	9.84E-05	6.80E-05	5.22E-05	4.57E-05	7.62E-05	1.67E-04	4.07E-04	6.96E-04	6.47E-04	5.68E-04	5.30E-04	3.65E-04	3.29E-04	3.62E-04	4.02E-04	4.34E-04	4.86E-04	5.35E-04	4.89E-04	3.55E-04	2.69E-04	2.51E-04	2.04E-04
	Emission in each Box of 2nd jet	g/s	7.51E-05	5.74E-05	3.97E-05	3.04E-05	2.67E-05	4.44E-05	9.73E-05	2.37E-04	4.06E-04	3.77E-04	3.31E-04	3.09E-04	2.13E-04	1.92E-04	2.11E-04	2.34E-04	2.53E-04	2.84E-04	3.12E-04	2.85E-04	2.07E-04	1.57E-04	1.47E-04	1.19E-04
RSP Emission Rate		g/s	***4.33E-04***	***2.76E-04***	***1.95E-04***	***1.54E-04***	***1.36E-04***	***3.79E-04***	***8.70E-04***	***1.56E-03***	***2.02E-03***	***1.89E-03***	***1.72E-03***	***1.64E-03***	***1.02E-03***	***9.44E-04***	***1.01E-03***	***1.09E-03***	***1.16E-03***	***1.27E-03***	***1.37E-03***	***1.25E-03***	***9.90E-04***	***8.11E-04***	***7.57E-04***	***6.16E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.89E-04	1.84E-04	1.30E-04	1.03E-04	9.09E-05	2.53E-04	5.80E-04	1.04E-03	1.34E-03	1.26E-03	1.15E-03	1.09E-03	6.79E-04	6.29E-04	6.70E-04	7.25E-04	7.71E-04	8.50E-04	9.10E-04	8.31E-04	6.60E-04	5.41E-04	5.05E-04	4.10E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	9.20E-05	6.49E-05	5.15E-05	4.54E-05	1.26E-04	2.90E-04	5.19E-04	6.72E-04	6.29E-04	5.73E-04	5.47E-04	3.40E-04	3.15E-04	3.35E-04	3.63E-04	3.86E-04	4.25E-04	4.55E-04	4.15E-04	3.30E-04	2.70E-04	2.52E-04	2.05E-04
	Emission in each Box of 1st jet	g/s	4.12E-05	2.63E-05	1.86E-05	1.47E-05	1.30E-05	3.61E-05	8.28E-05	1.48E-04	1.92E-04	1.80E-04	1.64E-04	1.56E-04	9.70E-05	8.99E-05	9.57E-05	1.04E-04	1.10E-04	1.21E-04	1.30E-04	1.19E-04	9.43E-05	7.72E-05	7.21E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	2.40E-05	1.53E-05	1.08E-05	8.58E-06	7.57E-06	2.11E-05	4.83E-05	8.65E-05	1.12E-04	1.05E-04	9.54E-05	9.11E-05	5.66E-05	5.24E-05	5.59E-05	6.04E-05	6.43E-05	7.08E-05	7.59E-05	6.92E-05	5.50E-05	4.50E-05	4.21E-05	3.42E-05
FSP Emission Rate		g/s	***3.98E-04***	***2.54E-04***	***1.79E-04***	***1.42E-04***	***1.25E-04***	***3.49E-04***	***8.00E-04***	***1.43E-03***	***1.85E-03***	***1.74E-03***	***1.58E-03***	***1.51E-03***	***9.37E-04***	***8.67E-04***	***9.25E-04***	***1.00E-03***	***1.06E-03***	***1.17E-03***	***1.25E-03***	***1.15E-03***	***9.11E-04***	***7.47E-04***	***6.97E-04***	***5.68E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.65E-04	1.69E-04	1.19E-04	9.46E-05	8.36E-05	2.32E-04	5.33E-04	9.56E-04	1.23E-03	1.16E-03	1.05E-03	1.01E-03	6.25E-04	5.78E-04	6.16E-04	6.67E-04	7.09E-04	7.82E-04	8.35E-04	7.64E-04	6.07E-04	4.98E-04	4.65E-04	3.78E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.33E-04	8.46E-05	5.97E-05	4.73E-05	4.18E-05	1.16E-04	2.67E-04	4.78E-04	6.17E-04	5.79E-04	5.27E-04	5.03E-04	3.12E-04	2.89E-04	3.08E-04	3.34E-04	3.54E-04	3.91E-04	4.18E-04	3.82E-04	3.04E-04	2.49E-04	2.32E-04	1.89E-04
	Emission in each Box of 1st jet	g/s	3.79E-05	2.42E-05	1.71E-05	1.35E-05	1.19E-05	3.32E-05	7.62E-05	1.37E-04	1.76E-04	1.65E-04	1.50E-04	1.44E-04	8.92E-05	8.26E-05	8.81E-05	9.53E-05	1.01E-04	1.12E-04	1.19E-04	1.09E-04	8.67E-05	7.11E-05	6.64E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	2.21E-05	1.41E-05	9.95E-06	7.89E-06	6.96E-06	1.94E-05	4.44E-05	7.97E-05	1.03E-04	9.65E-05	8.78E-05	8.38E-05	5.21E-05	4.82E-05	5.14E-05	5.56E-05	5.91E-05	6.52E-05	6.96E-05	6.37E-05	5.06E-05	4.15E-05	3.87E-05	3.15E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section 086A01-086A09
Enclosure Involvec 086P1
Road Located 086
Vehicle EF Adopte 086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2558	0.2239	0.2224	0.2364	0.2444	0.4065	0.4268	0.3656	0.3850	0.3693	0.3485	0.3402	0.3468	0.3411	0.3330	0.3451	0.3552	0.3736	0.3808	0.3582	0.3301	0.3345	0.3283	0.3076
	NO2	g/vehicle/km	0.0495	0.0481	0.0474	0.0486	0.0498	0.0581	0.0588	0.0614	0.0738	0.0711	0.0670	0.0648	0.0584	0.0566	0.0558	0.0579	0.0600	0.0630	0.0651	0.0621	0.0556	0.0533	0.0519	0.0494
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0055***	***0.0040***	***0.0027***	***0.0021***	***0.0018***	***0.0037***	***0.0082***	***0.0175***	***0.0277***	***0.0258***	***0.0223***	***0.0208***	***0.0201***	***0.0186***	***0.0192***	***0.0209***	***0.0225***	***0.0254***	***0.0274***	***0.0247***	***0.0188***	***0.0157***	***0.0144***	***0.0118***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.70E-03	2.64E-03	1.80E-03	1.42E-03	1.23E-03	2.46E-03	5.49E-03	1.17E-02	1.85E-02	1.72E-02	1.48E-02	1.39E-02	1.34E-02	1.24E-02	1.28E-02	1.39E-02	1.50E-02	1.70E-02	1.82E-02	1.65E-02	1.25E-02	1.04E-02	9.57E-03	7.84E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.85E-03	1.32E-03	8.99E-04	7.08E-04	6.15E-04	1.23E-03	2.74E-03	5.85E-03	9.23E-03	8.59E-03	7.42E-03	6.93E-03	6.71E-03	6.19E-03	6.40E-03	6.96E-03	7.49E-03	8.48E-03	9.12E-03	8.23E-03	6.25E-03	5.22E-03	4.79E-03	3.92E-03
	Emission in each Box of 1st jet	g/s	5.29E-04	3.77E-04	2.57E-04	2.02E-04	1.76E-04	3.51E-04	7.84E-04	1.67E-03	2.64E-03	2.45E-03	2.12E-03	1.98E-03	1.92E-03	1.77E-03	1.83E-03	1.99E-03	2.14E-03	2.42E-03	2.61E-03	2.35E-03	1.79E-03	1.49E-03	1.37E-03	1.12E-03
	Emission in each Box of 2nd jet	g/s	9.25E-04	6.59E-04	4.49E-04	3.54E-04	3.07E-04	6.15E-04	1.37E-03	2.92E-03	4.62E-03	4.29E-03	3.71E-03	3.47E-03	3.36E-03	3.09E-03	3.20E-03	3.48E-03	3.75E-03	4.24E-03	4.56E-03	4.12E-03	3.13E-03	2.61E-03	2.39E-03	1.96E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0029***	***0.0053***	***0.0050***	***0.0043***	***0.0040***	***0.0034***	***0.0031***	***0.0032***	***0.0035***	***0.0038***	***0.0043***	***0.0047***	***0.0043***	***0.0032***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.16E-04	5.67E-04	3.83E-04	2.91E-04	2.51E-04	3.51E-04	7.56E-04	1.96E-03	3.54E-03	3.31E-03	2.85E-03	2.64E-03	2.26E-03	2.05E-03	2.14E-03	2.33E-03	2.53E-03	2.86E-03	3.12E-03	2.86E-03	2.11E-03	1.67E-03	1.51E-03	1.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.58E-04	2.84E-04	1.92E-04	1.45E-04	1.25E-04	1.76E-04	3.78E-04	9.82E-04	1.77E-03	1.65E-03	1.43E-03	1.32E-03	1.13E-03	1.03E-03	1.07E-03	1.17E-03	1.27E-03	1.43E-03	1.56E-03	1.43E-03	1.05E-03	8.33E-04	7.57E-04	6.30E-04
	Emission in each Box of 1st jet	g/s	1.02E-04	8.10E-05	5.47E-05	4.15E-05	3.58E-05	5.02E-05	1.08E-04	2.80E-04	5.06E-04	4.72E-04	4.08E-04	3.77E-04	3.23E-04	2.93E-04	3.06E-04	3.33E-04	3.61E-04	4.09E-04	4.46E-04	4.08E-04	3.01E-04	2.38E-04	2.16E-04	1.80E-04
	Emission in each Box of 2nd jet	g/s	1.79E-04	1.42E-04	9.58E-05	7.27E-05	6.26E-05	8.78E-05	1.89E-04	4.91E-04	8.85E-04	8.27E-04	7.14E-04	6.60E-04	5.66E-04	5.13E-04	5.36E-04	5.83E-04	6.33E-04	7.15E-04	7.80E-04	7.14E-04	5.27E-04	4.16E-04	3.79E-04	3.15E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2395	0.2078	0.2058	0.2213	0.2284	0.3805	0.3959	0.3425	0.3574	0.3387	0.3216	0.3139	0.3197	0.3169	0.3118	0.3203	0.3294	0.3484	0.3548	0.3360	0.3093	0.3140	0.3049	0.2855
	NO2	g/vehicle/km	0.0466	0.0451	0.0443	0.0458	0.0469	0.0546	0.0548	0.0578	0.0690	0.0657	0.0623	0.0602	0.0543	0.0529	0.0525	0.0541	0.0560	0.0591	0.0610	0.0586	0.0524	0.0504	0.0485	0.0461
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0052***	***0.0037***	***0.0025***	***0.0020***	***0.0017***	***0.0035***	***0.0076***	***0.0164***	***0.0257***	***0.0236***	***0.0205***	***0.0192***	***0.0186***	***0.0172***	***0.0180***	***0.0194***	***0.0208***	***0.0237***	***0.0255***	***0.0232***	***0.0176***	***0.0147***	***0.0133***	***0.0109***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.46E-03	2.45E-03	1.66E-03	1.33E-03	1.15E-03	2.30E-03	5.09E-03	1.10E-02	1.71E-02	1.58E-02	1.37E-02	1.28E-02	1.24E-02	1.15E-02	1.20E-02	1.29E-02	1.39E-02	1.58E-02	1.70E-02	1.54E-02	1.17E-02	9.81E-03	8.89E-03	7.28E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.73E-03	1.22E-03	8.32E-04	6.63E-04	5.74E-04	1.15E-03	2.55E-03	5.48E-03	8.57E-03	7.88E-03	6.85E-03	6.40E-03	6.19E-03	5.75E-03	5.99E-03	6.46E-03	6.95E-03	7.91E-03	8.50E-03	7.72E-03	5.86E-03	4.90E-03	4.45E-03	3.64E-03
	Emission in each Box of 1st jet	g/s	4.95E-04	3.50E-04	2.38E-04	1.89E-04	1.64E-04	3.29E-04	7.27E-04	1.57E-03	2.45E-03	2.25E-03	1.96E-03	1.83E-03	1.77E-03	1.64E-03	1.71E-03	1.84E-03	1.99E-03	2.26E-03	2.43E-03	2.21E-03	1.67E-03	1.40E-03	1.27E-03	1.04E-03
	Emission in each Box of 2nd jet	g/s	8.66E-04	6.12E-04	4.16E-04	3.31E-04	2.87E-04	5.75E-04	1.27E-03	2.74E-03	4.28E-03	3.94E-03	3.42E-03	3.20E-03	3.09E-03	2.87E-03	3.00E-03	3.23E-03	3.47E-03	3.96E-03	4.25E-03	3.86E-03	2.93E-03	2.45E-03	2.22E-03	1.82E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0028***	***0.0050***	***0.0046***	***0.0040***	***0.0037***	***0.0032***	***0.0029***	***0.0030***	***0.0033***	***0.0035***	***0.0040***	***0.0044***	***0.0040***	***0.0030***	***0.0024***	***0.0021***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.74E-04	5.31E-04	3.58E-04	2.74E-04	2.36E-04	3.30E-04	7.05E-04	1.85E-03	3.31E-03	3.05E-03	2.65E-03	2.45E-03	2.10E-03	1.92E-03	2.02E-03	2.18E-03	2.36E-03	2.68E-03	2.92E-03	2.69E-03	1.99E-03	1.57E-03	1.42E-03	1.18E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.37E-04	2.65E-04	1.79E-04	1.37E-04	1.18E-04	1.65E-04	3.52E-04	9.24E-04	1.66E-03	1.53E-03	1.33E-03	1.23E-03	1.05E-03	9.60E-04	1.01E-03	1.09E-03	1.18E-03	1.34E-03	1.46E-03	1.35E-03	9.93E-04	7.87E-04	7.08E-04	5.88E-04
	Emission in each Box of 1st jet	g/s	9.63E-05	7.58E-05	5.11E-05	3.92E-05	3.37E-05	4.72E-05	1.01E-04	2.64E-04	4.73E-04	4.36E-04	3.79E-04	3.50E-04	3.00E-04	2.74E-04	2.88E-04	3.11E-04	3.38E-04	3.83E-04	4.18E-04	3.85E-04	2.84E-04	2.25E-04	2.02E-04	1.68E-04
	Emission in each Box of 2nd jet	g/s	1.69E-04	1.33E-04	8.95E-05	6.85E-05	5.90E-05	8.26E-05	1.76E-04	4.62E-04	8.28E-04	7.64E-04	6.63E-04	6.13E-04	5.25E-04	4.80E-04	5.04E-04	5.45E-04	5.91E-04	6.71E-04	7.31E-04	6.73E-04	4.97E-04	3.93E-04	3.54E-04	2.94E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2263	0.1965	0.1951	0.2068	0.2134	0.3568	0.3722	0.3226	0.3374	0.3227	0.3030	0.2997	0.3050	0.2977	0.2929	0.3046	0.3099	0.3296	0.3379	0.3173	0.2909	0.2954	0.2866	0.2690
	NO2	g/vehicle/km	0.0443	0.0429	0.0422	0.0431	0.0442	0.0515	0.0518	0.0547	0.0654	0.0627	0.0588	0.0575	0.0519	0.0499	0.0495	0.0515	0.0528	0.0561	0.0583	0.0556	0.0495	0.0476	0.0458	0.0437
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0049***	***0.0035***	***0.0024***	***0.0019***	***0.0016***	***0.0032***	***0.0072***	***0.0155***	***0.0243***	***0.0225***	***0.0194***	***0.0183***	***0.0177***	***0.0162***	***0.0169***	***0.0184***	***0.0196***	***0.0224***	***0.0243***	***0.0219***	***0.0165***	***0.0138***	***0.0125***	***0.0103***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.27E-03	2.32E-03	1.58E-03	1.24E-03	1.07E-03	2.16E-03	4.79E-03	1.03E-02	1.62E-02	1.50E-02	1.29E-02	1.22E-02	1.18E-02	1.08E-02	1.13E-02	1.23E-02	1.31E-02	1.50E-02	1.62E-02	1.46E-02	1.10E-02	9.23E-03	8.36E-03	6.86E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.64E-03	1.16E-03	7.88E-04	6.19E-04	5.37E-04	1.08E-03	2.39E-03	5.16E-03	8.09E-03	7.50E-03	6.45E-03	6.11E-03	5.90E-03	5.40E-03	5.63E-03	6.14E-03	6.54E-03	7.48E-03	8.10E-03	7.29E-03	5.51E-03	4.61E-03	4.18E-03	3.43E-03
	Emission in each Box of 1st jet	g/s	4.68E-04	3.31E-04	2.25E-04	1.77E-04	1.53E-04	3.08E-04	6.84E-04	1.47E-03	2.31E-03	2.14E-03	1.84E-03	1.75E-03	1.69E-03	1.54E-03	1.61E-03	1.75E-03	1.87E-03	2.14E-03	2.31E-03	2.08E-03	1.57E-03	1.32E-03	1.19E-03	9.80E-04
	Emission in each Box of 2nd jet	g/s	8.18E-04	5.79E-04	3.94E-04	3.10E-04	2.68E-04	5.39E-04	1.20E-03	2.58E-03	4.04E-03	3.75E-03	3.23E-03	3.05E-03	2.95E-03	2.70E-03	2.81E-03	3.07E-03	3.27E-03	3.74E-03	4.05E-03	3.65E-03	2.76E-03	2.31E-03	2.09E-03	1.72E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0026***	***0.0047***	***0.0044***	***0.0038***	***0.0035***	***0.0030***	***0.0027***	***0.0029***	***0.0031***	***0.0033***	***0.0038***	***0.0042***	***0.0038***	***0.0028***	***0.0022***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.40E-04	5.05E-04	3.41E-04	2.58E-04	2.22E-04	3.11E-04	6.66E-04	1.75E-03	3.14E-03	2.92E-03	2.50E-03	2.35E-03	2.01E-03	1.81E-03	1.90E-03	2.08E-03	2.23E-03	2.55E-03	2.80E-03	2.55E-03	1.88E-03	1.49E-03	1.34E-03	1.11E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.20E-04	2.53E-04	1.71E-04	1.29E-04	1.11E-04	1.56E-04	3.33E-04	8.75E-04	1.57E-03	1.46E-03	1.25E-03	1.17E-03	1.00E-03	9.04E-04	9.51E-04	1.04E-03	1.11E-03	1.27E-03	1.40E-03	1.28E-03	9.39E-04	7.43E-04	6.68E-04	5.57E-04
	Emission in each Box of 1st jet	g/s	9.15E-05	7.22E-05	4.88E-05	3.69E-05	3.18E-05	4.45E-05	9.51E-05	2.50E-04	4.48E-04	4.17E-04	3.58E-04	3.35E-04	2.87E-04	2.58E-04	2.72E-04	2.97E-04	3.18E-04	3.64E-04	3.99E-04	3.65E-04	2.68E-04	2.12E-04	1.91E-04	1.59E-04
	Emission in each Box of 2nd jet	g/s	1.60E-04	1.26E-04	8.54E-05	6.46E-05	5.56E-05	7.78E-05	1.66E-04	4.38E-04	7.85E-04	7.29E-04	6.26E-04	5.86E-04	5.02E-04	4.52E-04	4.75E-04	5.19E-04	5.57E-04	6.36E-04	6.99E-04	6.39E-04	4.69E-04	3.72E-04	3.34E-04	2.78E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2128	0.1846	0.1825	0.1981	0.2044	0.3434	0.3583	0.3075	0.3217	0.3077	0.2886	0.2850	0.2899	0.2878	0.2831	0.2892	0.3004	0.3136	0.3217	0.3005	0.2761	0.2849	0.2753	0.2574
	NO2	g/vehicle/km	0.0419	0.0405	0.0398	0.0415	0.0425	0.0497	0.0500	0.0523	0.0625	0.0600	0.0562	0.0549	0.0495	0.0483	0.0479	0.0491	0.0513	0.0535	0.0557	0.0529	0.0472	0.0460	0.0442	0.0419
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0046***	***0.0033***	***0.0022***	***0.0018***	***0.0015***	***0.0031***	***0.0069***	***0.0148***	***0.0231***	***0.0215***	***0.0184***	***0.0174***	***0.0168***	***0.0157***	***0.0163***	***0.0175***	***0.0190***	***0.0214***	***0.0231***	***0.0207***	***0.0157***	***0.0133***	***0.0120***	***0.0098***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.08E-03	2.18E-03	1.47E-03	1.19E-03	1.03E-03	2.08E-03	4.61E-03	9.84E-03	1.54E-02	1.43E-02	1.23E-02	1.16E-02	1.12E-02	1.04E-02	1.09E-02	1.17E-02	1.27E-02	1.42E-02	1.54E-02	1.38E-02	1.05E-02	8.90E-03	8.03E-03	6.56E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.54E-03	1.09E-03	7.37E-04	5.93E-04	5.14E-04	1.04E-03	2.30E-03	4.92E-03	7.71E-03	7.16E-03	6.15E-03	5.81E-03	5.61E-03	5.22E-03	5.44E-03	5.83E-03	6.34E-03	7.12E-03	7.71E-03	6.91E-03	5.23E-03	4.45E-03	4.01E-03	3.28E-03
	Emission in each Box of 1st jet	g/s	4.40E-04	3.11E-04	2.11E-04	1.69E-04	1.47E-04	2.97E-04	6.58E-04	1.41E-03	2.20E-03	2.04E-03	1.76E-03	1.66E-03	1.60E-03	1.49E-03	1.55E-03	1.67E-03	1.81E-03	2.03E-03	2.20E-03	1.97E-03	1.49E-03	1.27E-03	1.15E-03	9.38E-04
	Emission in each Box of 2nd jet	g/s	7.69E-04	5.44E-04	3.69E-04	2.97E-04	2.57E-04	5.19E-04	1.15E-03	2.46E-03	3.86E-03	3.58E-03	3.07E-03	2.90E-03	2.81E-03	2.61E-03	2.72E-03	2.92E-03	3.17E-03	3.56E-03	3.86E-03	3.45E-03	2.62E-03	2.22E-03	2.01E-03	1.64E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0025***	***0.0045***	***0.0042***	***0.0036***	***0.0034***	***0.0029***	***0.0026***	***0.0028***	***0.0030***	***0.0032***	***0.0036***	***0.0040***	***0.0036***	***0.0027***	***0.0022***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.05E-04	4.78E-04	3.22E-04	2.49E-04	2.14E-04	3.00E-04	6.42E-04	1.67E-03	3.00E-03	2.79E-03	2.39E-03	2.24E-03	1.92E-03	1.75E-03	1.84E-03	1.98E-03	2.17E-03	2.43E-03	2.67E-03	2.43E-03	1.79E-03	1.44E-03	1.29E-03	1.07E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.03E-04	2.39E-04	1.61E-04	1.24E-04	1.07E-04	1.50E-04	3.21E-04	8.36E-04	1.50E-03	1.39E-03	1.20E-03	1.12E-03	9.58E-04	8.76E-04	9.21E-04	9.90E-04	1.08E-03	1.22E-03	1.33E-03	1.21E-03	8.94E-04	7.18E-04	6.44E-04	5.35E-04
	Emission in each Box of 1st jet	g/s	8.65E-05	6.82E-05	4.59E-05	3.55E-05	3.05E-05	4.29E-05	9.18E-05	2.39E-04	4.28E-04	3.98E-04	3.42E-04	3.20E-04	2.74E-04	2.50E-04	2.63E-04	2.83E-04	3.09E-04	3.47E-04	3.81E-04	3.47E-04	2.55E-04	2.05E-04	1.84E-04	1.53E-04
	Emission in each Box of 2nd jet	g/s	1.51E-04	1.19E-04	8.04E-05	6.21E-05	5.35E-05	7.51E-05	1.61E-04	4.18E-04	7.49E-04	6.97E-04	5.98E-04	5.59E-04	4.79E-04	4.38E-04	4.60E-04	4.95E-04	5.42E-04	6.08E-04	6.67E-04	6.07E-04	4.47E-04	3.59E-04	3.22E-04	2.67E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1916	0.1651	0.1637	0.1731	0.1787	0.3001	0.3094	0.2676	0.2837	0.2699	0.2574	0.2536	0.2595	0.2564	0.2540	0.2583	0.2675	0.2835	0.2836	0.2698	0.2473	0.2482	0.2417	0.2256
	NO2	g/vehicle/km	0.0379	0.0365	0.0360	0.0366	0.0375	0.0437	0.0434	0.0458	0.0554	0.0529	0.0503	0.0491	0.0445	0.0432	0.0432	0.0441	0.0459	0.0486	0.0494	0.0477	0.0425	0.0404	0.0391	0.0370
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0042***	***0.0029***	***0.0020***	***0.0016***	***0.0013***	***0.0027***	***0.0060***	***0.0128***	***0.0204***	***0.0188***	***0.0164***	***0.0155***	***0.0151***	***0.0139***	***0.0146***	***0.0156***	***0.0169***	***0.0193***	***0.0204***	***0.0186***	***0.0141***	***0.0116***	***0.0106***	***0.0086***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.77E-03	1.95E-03	1.32E-03	1.04E-03	8.99E-04	1.81E-03	3.98E-03	8.56E-03	1.36E-02	1.26E-02	1.10E-02	1.03E-02	1.00E-02	9.30E-03	9.76E-03	1.04E-02	1.13E-02	1.29E-02	1.36E-02	1.24E-02	9.37E-03	7.75E-03	7.05E-03	5.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.39E-03	9.73E-04	6.62E-04	5.18E-04	4.50E-04	9.07E-04	1.99E-03	4.28E-03	6.80E-03	6.28E-03	5.48E-03	5.17E-03	5.02E-03	4.65E-03	4.88E-03	5.21E-03	5.64E-03	6.44E-03	6.80E-03	6.20E-03	4.68E-03	3.88E-03	3.52E-03	2.88E-03
	Emission in each Box of 1st jet	g/s	3.96E-04	2.78E-04	1.89E-04	1.48E-04	1.28E-04	2.59E-04	5.68E-04	1.22E-03	1.94E-03	1.79E-03	1.57E-03	1.48E-03	1.44E-03	1.33E-03	1.39E-03	1.49E-03	1.61E-03	1.84E-03	1.94E-03	1.77E-03	1.34E-03	1.11E-03	1.01E-03	8.22E-04
	Emission in each Box of 2nd jet	g/s	6.93E-04	4.86E-04	3.31E-04	2.59E-04	2.25E-04	4.54E-04	9.95E-04	2.14E-03	3.40E-03	3.14E-03	2.74E-03	2.59E-03	2.51E-03	2.32E-03	2.44E-03	2.60E-03	2.82E-03	3.22E-03	3.40E-03	3.10E-03	2.34E-03	1.94E-03	1.76E-03	1.44E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0008***	***0.0022***	***0.0040***	***0.0037***	***0.0032***	***0.0030***	***0.0026***	***0.0024***	***0.0025***	***0.0027***	***0.0029***	***0.0033***	***0.0036***	***0.0033***	***0.0024***	***0.0019***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.48E-04	4.30E-04	2.91E-04	2.19E-04	1.89E-04	2.64E-04	5.58E-04	1.47E-03	2.66E-03	2.46E-03	2.14E-03	2.00E-03	1.72E-03	1.57E-03	1.66E-03	1.78E-03	1.94E-03	2.21E-03	2.37E-03	2.19E-03	1.61E-03	1.26E-03	1.14E-03	9.44E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.74E-04	2.15E-04	1.45E-04	1.10E-04	9.43E-05	1.32E-04	2.79E-04	7.33E-04	1.33E-03	1.23E-03	1.07E-03	1.00E-03	8.61E-04	7.84E-04	8.30E-04	8.88E-04	9.69E-04	1.10E-03	1.18E-03	1.10E-03	8.05E-04	6.31E-04	5.70E-04	4.72E-04
	Emission in each Box of 1st jet	g/s	7.83E-05	6.15E-05	4.15E-05	3.13E-05	2.70E-05	3.78E-05	7.98E-05	2.09E-04	3.80E-04	3.51E-04	3.06E-04	2.86E-04	2.46E-04	2.24E-04	2.37E-04	2.54E-04	2.77E-04	3.15E-04	3.38E-04	3.13E-04	2.30E-04	1.80E-04	1.63E-04	1.35E-04
	Emission in each Box of 2nd jet	g/s	1.37E-04	1.08E-04	7.27E-05	5.48E-05	4.72E-05	6.61E-05	1.40E-04	3.66E-04	6.64E-04	6.15E-04	5.36E-04	5.00E-04	4.31E-04	3.92E-04	4.15E-04	4.44E-04	4.85E-04	5.52E-04	5.92E-04	5.48E-04	4.03E-04	3.15E-04	2.85E-04	2.36E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1851	0.1603	0.1628	0.1722	0.1768	0.2969	0.3022	0.2644	0.2777	0.2696	0.2494	0.2457	0.2496	0.2483	0.2426	0.2501	0.2632	0.2768	0.2785	0.2668	0.2444	0.2467	0.2388	0.2242
	NO2	g/vehicle/km	0.0366	0.0355	0.0358	0.0364	0.0371	0.0433	0.0425	0.0453	0.0543	0.0528	0.0488	0.0476	0.0429	0.0419	0.0414	0.0428	0.0452	0.0475	0.0485	0.0471	0.0421	0.0402	0.0386	0.0368
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0040***	***0.0028***	***0.0020***	***0.0015***	***0.0013***	***0.0027***	***0.0058***	***0.0127***	***0.0200***	***0.0188***	***0.0159***	***0.0150***	***0.0145***	***0.0135***	***0.0140***	***0.0151***	***0.0167***	***0.0188***	***0.0200***	***0.0184***	***0.0139***	***0.0116***	***0.0104***	***0.0086***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.68E-03	1.89E-03	1.32E-03	1.03E-03	8.89E-04	1.80E-03	3.89E-03	8.46E-03	1.33E-02	1.25E-02	1.06E-02	1.00E-02	9.66E-03	9.00E-03	9.32E-03	1.01E-02	1.11E-02	1.26E-02	1.33E-02	1.23E-02	9.26E-03	7.71E-03	6.96E-03	5.72E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.34E-03	9.44E-04	6.58E-04	5.16E-04	4.45E-04	8.98E-04	1.94E-03	4.23E-03	6.66E-03	6.27E-03	5.31E-03	5.01E-03	4.83E-03	4.50E-03	4.66E-03	5.04E-03	5.55E-03	6.28E-03	6.67E-03	6.13E-03	4.63E-03	3.85E-03	3.48E-03	2.86E-03
	Emission in each Box of 1st jet	g/s	3.82E-04	2.70E-04	1.88E-04	1.47E-04	1.27E-04	2.57E-04	5.55E-04	1.21E-03	1.90E-03	1.79E-03	1.52E-03	1.43E-03	1.38E-03	1.29E-03	1.33E-03	1.44E-03	1.59E-03	1.80E-03	1.91E-03	1.75E-03	1.32E-03	1.10E-03	9.95E-04	8.17E-04
	Emission in each Box of 2nd jet	g/s	6.69E-04	4.72E-04	3.29E-04	2.58E-04	2.22E-04	4.49E-04	9.72E-04	2.12E-03	3.33E-03	3.13E-03	2.66E-03	2.50E-03	2.42E-03	2.25E-03	2.33E-03	2.52E-03	2.78E-03	3.14E-03	3.34E-03	3.07E-03	2.32E-03	1.93E-03	1.74E-03	1.43E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0008***	***0.0022***	***0.0039***	***0.0037***	***0.0031***	***0.0029***	***0.0025***	***0.0023***	***0.0024***	***0.0026***	***0.0029***	***0.0032***	***0.0035***	***0.0033***	***0.0024***	***0.0019***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.30E-04	4.18E-04	2.89E-04	2.18E-04	1.87E-04	2.62E-04	5.46E-04	1.45E-03	2.60E-03	2.45E-03	2.08E-03	1.94E-03	1.66E-03	1.52E-03	1.59E-03	1.72E-03	1.91E-03	2.15E-03	2.32E-03	2.17E-03	1.59E-03	1.25E-03	1.13E-03	9.39E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.65E-04	2.09E-04	1.44E-04	1.09E-04	9.34E-05	1.31E-04	2.73E-04	7.24E-04	1.30E-03	1.23E-03	1.04E-03	9.70E-04	8.30E-04	7.61E-04	7.95E-04	8.62E-04	9.54E-04	1.08E-03	1.16E-03	1.08E-03	7.97E-04	6.27E-04	5.63E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	7.57E-05	5.97E-05	4.13E-05	3.12E-05	2.67E-05	3.74E-05	7.81E-05	2.07E-04	3.72E-04	3.51E-04	2.97E-04	2.77E-04	2.37E-04	2.17E-04	2.27E-04	2.46E-04	2.73E-04	3.08E-04	3.32E-04	3.10E-04	2.28E-04	1.79E-04	1.61E-04	1.34E-04
	Emission in each Box of 2nd jet	g/s	1.32E-04	1.04E-04	7.22E-05	5.45E-05	4.67E-05	6.54E-05	1.37E-04	3.62E-04	6.51E-04	6.14E-04	5.20E-04	4.85E-04	4.15E-04	3.80E-04	3.97E-04	4.31E-04	4.77E-04	5.39E-04	5.81E-04	5.42E-04	3.98E-04	3.14E-04	2.82E-04	2.35E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1861	0.1593	0.1580	0.1669	0.1723	0.2878	0.3022	0.2579	0.2710	0.2607	0.2504	0.2485	0.2451	0.2439	0.2454	0.2513	0.2585	0.2758	0.2754	0.2637	0.2400	0.2437	0.2358	0.2187
	NO2	g/vehicle/km	0.0368	0.0353	0.0347	0.0354	0.0363	0.0420	0.0425	0.0442	0.0530	0.0511	0.0490	0.0481	0.0421	0.0412	0.0418	0.0429	0.0444	0.0473	0.0480	0.0466	0.0413	0.0397	0.0382	0.0359
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0040***	***0.0028***	***0.0019***	***0.0015***	***0.0013***	***0.0026***	***0.0058***	***0.0124***	***0.0195***	***0.0182***	***0.0160***	***0.0152***	***0.0142***	***0.0133***	***0.0141***	***0.0152***	***0.0164***	***0.0188***	***0.0198***	***0.0182***	***0.0136***	***0.0114***	***0.0103***	***0.0084***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.69E-03	1.88E-03	1.28E-03	9.99E-04	8.67E-04	1.74E-03	3.89E-03	8.25E-03	1.30E-02	1.21E-02	1.07E-02	1.01E-02	9.49E-03	8.85E-03	9.43E-03	1.01E-02	1.09E-02	1.25E-02	1.32E-02	1.21E-02	9.10E-03	7.61E-03	6.88E-03	5.58E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.35E-03	9.39E-04	6.38E-04	5.00E-04	4.33E-04	8.70E-04	1.94E-03	4.13E-03	6.50E-03	6.06E-03	5.33E-03	5.07E-03	4.74E-03	4.42E-03	4.71E-03	5.07E-03	5.45E-03	6.26E-03	6.60E-03	6.06E-03	4.55E-03	3.81E-03	3.44E-03	2.79E-03
	Emission in each Box of 1st jet	g/s	3.85E-04	2.68E-04	1.82E-04	1.43E-04	1.24E-04	2.49E-04	5.55E-04	1.18E-03	1.86E-03	1.73E-03	1.52E-03	1.45E-03	1.36E-03	1.26E-03	1.35E-03	1.45E-03	1.56E-03	1.79E-03	1.89E-03	1.73E-03	1.30E-03	1.09E-03	9.82E-04	7.97E-04
	Emission in each Box of 2nd jet	g/s	6.73E-04	4.69E-04	3.19E-04	2.50E-04	2.17E-04	4.35E-04	9.72E-04	2.06E-03	3.25E-03	3.03E-03	2.67E-03	2.53E-03	2.37E-03	2.21E-03	2.36E-03	2.53E-03	2.73E-03	3.13E-03	3.30E-03	3.03E-03	2.27E-03	1.90E-03	1.72E-03	1.39E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0008***	***0.0021***	***0.0038***	***0.0036***	***0.0031***	***0.0029***	***0.0024***	***0.0022***	***0.0024***	***0.0026***	***0.0028***	***0.0032***	***0.0034***	***0.0032***	***0.0023***	***0.0019***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.33E-04	4.16E-04	2.81E-04	2.12E-04	1.82E-04	2.54E-04	5.46E-04	1.41E-03	2.54E-03	2.38E-03	2.09E-03	1.96E-03	1.63E-03	1.50E-03	1.61E-03	1.73E-03	1.87E-03	2.15E-03	2.30E-03	2.14E-03	1.57E-03	1.24E-03	1.11E-03	9.15E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.66E-04	2.08E-04	1.40E-04	1.06E-04	9.12E-05	1.27E-04	2.73E-04	7.07E-04	1.27E-03	1.19E-03	1.04E-03	9.80E-04	8.15E-04	7.48E-04	8.03E-04	8.65E-04	9.37E-04	1.07E-03	1.15E-03	1.07E-03	7.83E-04	6.20E-04	5.57E-04	4.57E-04
	Emission in each Box of 1st jet	g/s	7.61E-05	5.94E-05	4.01E-05	3.03E-05	2.61E-05	3.63E-05	7.81E-05	2.02E-04	3.63E-04	3.40E-04	2.98E-04	2.80E-04	2.33E-04	2.14E-04	2.29E-04	2.47E-04	2.68E-04	3.07E-04	3.29E-04	3.06E-04	2.24E-04	1.77E-04	1.59E-04	1.31E-04
	Emission in each Box of 2nd jet	g/s	1.33E-04	1.04E-04	7.02E-05	5.30E-05	4.56E-05	6.35E-05	1.37E-04	3.54E-04	6.36E-04	5.94E-04	5.22E-04	4.90E-04	4.07E-04	3.74E-04	4.01E-04	4.32E-04	4.69E-04	5.37E-04	5.75E-04	5.36E-04	3.92E-04	3.10E-04	2.78E-04	2.29E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1886	0.1625	0.1611	0.1703	0.1758	0.2937	0.3082	0.2644	0.2743	0.2617	0.2544	0.2489	0.2496	0.2483	0.2442	0.2501	0.2648	0.2750	0.2834	0.2637	0.2401	0.2439	0.2361	0.2216
	NO2	g/vehicle/km	0.0373	0.0359	0.0354	0.0361	0.0369	0.0428	0.0433	0.0453	0.0537	0.0513	0.0497	0.0482	0.0429	0.0419	0.0416	0.0428	0.0455	0.0472	0.0494	0.0466	0.0414	0.0397	0.0382	0.0364
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0041***	***0.0029***	***0.0020***	***0.0015***	***0.0013***	***0.0027***	***0.0059***	***0.0127***	***0.0197***	***0.0183***	***0.0163***	***0.0152***	***0.0145***	***0.0135***	***0.0141***	***0.0151***	***0.0168***	***0.0187***	***0.0204***	***0.0182***	***0.0136***	***0.0114***	***0.0103***	***0.0085***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.73E-03	1.91E-03	1.30E-03	1.02E-03	8.84E-04	1.78E-03	3.96E-03	8.46E-03	1.32E-02	1.22E-02	1.08E-02	1.01E-02	9.66E-03	9.00E-03	9.38E-03	1.01E-02	1.12E-02	1.25E-02	1.36E-02	1.21E-02	9.10E-03	7.62E-03	6.88E-03	5.65E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.36E-03	9.57E-04	6.51E-04	5.10E-04	4.42E-04	8.88E-04	1.98E-03	4.23E-03	6.58E-03	6.08E-03	5.42E-03	5.07E-03	4.83E-03	4.50E-03	4.69E-03	5.04E-03	5.59E-03	6.24E-03	6.79E-03	6.06E-03	4.55E-03	3.81E-03	3.44E-03	2.83E-03
	Emission in each Box of 1st jet	g/s	3.90E-04	2.73E-04	1.86E-04	1.46E-04	1.26E-04	2.54E-04	5.66E-04	1.21E-03	1.88E-03	1.74E-03	1.55E-03	1.45E-03	1.38E-03	1.29E-03	1.34E-03	1.44E-03	1.60E-03	1.78E-03	1.94E-03	1.73E-03	1.30E-03	1.09E-03	9.83E-04	8.07E-04
	Emission in each Box of 2nd jet	g/s	6.82E-04	4.79E-04	3.25E-04	2.55E-04	2.21E-04	4.44E-04	9.91E-04	2.12E-03	3.29E-03	3.04E-03	2.71E-03	2.54E-03	2.42E-03	2.25E-03	2.35E-03	2.52E-03	2.79E-03	3.12E-03	3.40E-03	3.03E-03	2.27E-03	1.90E-03	1.72E-03	1.41E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0008***	***0.0022***	***0.0039***	***0.0036***	***0.0032***	***0.0029***	***0.0025***	***0.0023***	***0.0024***	***0.0026***	***0.0029***	***0.0032***	***0.0035***	***0.0032***	***0.0024***	***0.0019***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.39E-04	4.23E-04	2.86E-04	2.16E-04	1.86E-04	2.59E-04	5.57E-04	1.45E-03	2.57E-03	2.39E-03	2.12E-03	1.96E-03	1.66E-03	1.52E-03	1.60E-03	1.72E-03	1.92E-03	2.14E-03	2.37E-03	2.14E-03	1.57E-03	1.24E-03	1.11E-03	9.29E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.70E-04	2.12E-04	1.43E-04	1.08E-04	9.29E-05	1.29E-04	2.78E-04	7.24E-04	1.29E-03	1.19E-03	1.06E-03	9.82E-04	8.30E-04	7.61E-04	8.00E-04	8.62E-04	9.60E-04	1.07E-03	1.18E-03	1.07E-03	7.84E-04	6.21E-04	5.57E-04	4.64E-04
	Emission in each Box of 1st jet	g/s	7.71E-05	6.05E-05	4.09E-05	3.09E-05	2.65E-05	3.70E-05	7.95E-05	2.07E-04	3.68E-04	3.41E-04	3.03E-04	2.81E-04	2.37E-04	2.17E-04	2.28E-04	2.46E-04	2.74E-04	3.06E-04	3.38E-04	3.06E-04	2.24E-04	1.77E-04	1.59E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.35E-04	1.06E-04	7.15E-05	5.40E-05	4.65E-05	6.47E-05	1.39E-04	3.62E-04	6.43E-04	5.97E-04	5.30E-04	4.91E-04	4.15E-04	3.80E-04	4.00E-04	4.31E-04	4.80E-04	5.36E-04	5.91E-04	5.36E-04	3.92E-04	3.10E-04	2.79E-04	2.32E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1873	0.1612	0.1598	0.1679	0.1787	0.2985	0.3116	0.2611	0.2765	0.2644	0.2574	0.2486	0.2525	0.2547	0.2489	0.2565	0.2621	0.2739	0.2819	0.2605	0.2473	0.2496	0.2417	0.2269
	NO2	g/vehicle/km	0.0370	0.0357	0.0351	0.0356	0.0375	0.0435	0.0437	0.0447	0.0540	0.0518	0.0503	0.0480	0.0433	0.0429	0.0423	0.0438	0.0451	0.0470	0.0491	0.0461	0.0425	0.0406	0.0391	0.0372
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0041***	***0.0028***	***0.0019***	***0.0015***	***0.0013***	***0.0027***	***0.0060***	***0.0125***	***0.0199***	***0.0184***	***0.0164***	***0.0152***	***0.0147***	***0.0139***	***0.0143***	***0.0155***	***0.0166***	***0.0187***	***0.0203***	***0.0180***	***0.0141***	***0.0117***	***0.0106***	***0.0087***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.71E-03	1.90E-03	1.29E-03	1.01E-03	8.99E-04	1.81E-03	4.01E-03	8.36E-03	1.33E-02	1.23E-02	1.10E-02	1.01E-02	9.78E-03	9.24E-03	9.56E-03	1.03E-02	1.11E-02	1.24E-02	1.35E-02	1.20E-02	9.37E-03	7.80E-03	7.05E-03	5.79E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.35E-03	9.50E-04	6.46E-04	5.03E-04	4.50E-04	9.03E-04	2.00E-03	4.18E-03	6.63E-03	6.15E-03	5.48E-03	5.07E-03	4.89E-03	4.62E-03	4.78E-03	5.17E-03	5.53E-03	6.22E-03	6.76E-03	5.99E-03	4.68E-03	3.90E-03	3.52E-03	2.89E-03
	Emission in each Box of 1st jet	g/s	3.87E-04	2.71E-04	1.85E-04	1.44E-04	1.28E-04	2.58E-04	5.72E-04	1.19E-03	1.89E-03	1.76E-03	1.57E-03	1.45E-03	1.40E-03	1.32E-03	1.37E-03	1.48E-03	1.58E-03	1.78E-03	1.93E-03	1.71E-03	1.34E-03	1.11E-03	1.01E-03	8.27E-04
	Emission in each Box of 2nd jet	g/s	6.77E-04	4.75E-04	3.23E-04	2.51E-04	2.25E-04	4.51E-04	1.00E-03	2.09E-03	3.32E-03	3.07E-03	2.74E-03	2.53E-03	2.44E-03	2.31E-03	2.39E-03	2.59E-03	2.76E-03	3.11E-03	3.38E-03	2.99E-03	2.34E-03	1.95E-03	1.76E-03	1.45E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0008***	***0.0021***	***0.0039***	***0.0036***	***0.0032***	***0.0029***	***0.0025***	***0.0023***	***0.0024***	***0.0026***	***0.0029***	***0.0032***	***0.0035***	***0.0032***	***0.0024***	***0.0019***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.36E-04	4.20E-04	2.84E-04	2.13E-04	1.89E-04	2.63E-04	5.62E-04	1.43E-03	2.59E-03	2.41E-03	2.14E-03	1.96E-03	1.68E-03	1.56E-03	1.63E-03	1.77E-03	1.90E-03	2.13E-03	2.35E-03	2.12E-03	1.61E-03	1.27E-03	1.14E-03	9.49E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.68E-04	2.10E-04	1.42E-04	1.07E-04	9.43E-05	1.31E-04	2.81E-04	7.16E-04	1.30E-03	1.20E-03	1.07E-03	9.79E-04	8.38E-04	7.78E-04	8.13E-04	8.83E-04	9.51E-04	1.07E-03	1.18E-03	1.06E-03	8.05E-04	6.34E-04	5.70E-04	4.74E-04
	Emission in each Box of 1st jet	g/s	7.65E-05	6.00E-05	4.06E-05	3.05E-05	2.70E-05	3.76E-05	8.03E-05	2.04E-04	3.70E-04	3.44E-04	3.06E-04	2.80E-04	2.39E-04	2.22E-04	2.32E-04	2.52E-04	2.72E-04	3.05E-04	3.36E-04	3.03E-04	2.30E-04	1.81E-04	1.63E-04	1.36E-04
	Emission in each Box of 2nd jet	g/s	1.34E-04	1.05E-04	7.10E-05	5.33E-05	4.72E-05	6.57E-05	1.41E-04	3.58E-04	6.48E-04	6.02E-04	5.36E-04	4.90E-04	4.19E-04	3.89E-04	4.07E-04	4.41E-04	4.75E-04	5.33E-04	5.88E-04	5.30E-04	4.03E-04	3.17E-04	2.85E-04	2.37E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2109	0.1829	0.1807	0.1914	0.1968	0.3297	0.3454	0.2992	0.3129	0.2992	0.2802	0.2769	0.2830	0.2797	0.2752	0.2823	0.2921	0.3046	0.3154	0.2958	0.2727	0.2769	0.2684	0.2509
	NO2	g/vehicle/km	0.0415	0.0402	0.0394	0.0402	0.0410	0.0478	0.0482	0.0509	0.0609	0.0584	0.0546	0.0533	0.0483	0.0470	0.0466	0.0479	0.0499	0.0520	0.0547	0.0521	0.0466	0.0448	0.0432	0.0409
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0046***	***0.0032***	***0.0022***	***0.0017***	***0.0015***	***0.0030***	***0.0067***	***0.0144***	***0.0225***	***0.0209***	***0.0179***	***0.0169***	***0.0164***	***0.0152***	***0.0159***	***0.0171***	***0.0185***	***0.0207***	***0.0227***	***0.0204***	***0.0155***	***0.0130***	***0.0117***	***0.0096***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.05E-03	2.16E-03	1.46E-03	1.15E-03	9.90E-04	1.99E-03	4.44E-03	9.58E-03	1.50E-02	1.39E-02	1.19E-02	1.13E-02	1.10E-02	1.01E-02	1.06E-02	1.14E-02	1.23E-02	1.38E-02	1.51E-02	1.36E-02	1.03E-02	8.65E-03	7.83E-03	6.40E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.53E-03	1.08E-03	7.30E-04	5.73E-04	4.95E-04	9.97E-04	2.22E-03	4.79E-03	7.50E-03	6.96E-03	5.97E-03	5.65E-03	5.48E-03	5.07E-03	5.29E-03	5.69E-03	6.16E-03	6.92E-03	7.56E-03	6.80E-03	5.17E-03	4.32E-03	3.91E-03	3.20E-03
	Emission in each Box of 1st jet	g/s	4.36E-04	3.08E-04	2.09E-04	1.64E-04	1.41E-04	2.85E-04	6.34E-04	1.37E-03	2.14E-03	1.99E-03	1.70E-03	1.61E-03	1.57E-03	1.45E-03	1.51E-03	1.63E-03	1.76E-03	1.98E-03	2.16E-03	1.94E-03	1.48E-03	1.24E-03	1.12E-03	9.14E-04
	Emission in each Box of 2nd jet	g/s	7.63E-04	5.39E-04	3.65E-04	2.87E-04	2.47E-04	4.98E-04	1.11E-03	2.39E-03	3.75E-03	3.48E-03	2.98E-03	2.82E-03	2.74E-03	2.54E-03	2.64E-03	2.85E-03	3.08E-03	3.46E-03	3.78E-03	3.40E-03	2.58E-03	2.16E-03	1.96E-03	1.60E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0044***	***0.0041***	***0.0035***	***0.0033***	***0.0028***	***0.0026***	***0.0027***	***0.0029***	***0.0032***	***0.0035***	***0.0039***	***0.0036***	***0.0027***	***0.0021***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.00E-04	4.73E-04	3.18E-04	2.41E-04	2.06E-04	2.89E-04	6.20E-04	1.63E-03	2.92E-03	2.72E-03	2.32E-03	2.17E-03	1.87E-03	1.70E-03	1.79E-03	1.93E-03	2.11E-03	2.36E-03	2.62E-03	2.39E-03	1.77E-03	1.40E-03	1.26E-03	1.04E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.00E-04	2.37E-04	1.59E-04	1.20E-04	1.03E-04	1.44E-04	3.10E-04	8.15E-04	1.46E-03	1.36E-03	1.16E-03	1.09E-03	9.35E-04	8.51E-04	8.95E-04	9.66E-04	1.05E-03	1.18E-03	1.31E-03	1.20E-03	8.84E-04	7.00E-04	6.29E-04	5.22E-04
	Emission in each Box of 1st jet	g/s	8.57E-05	6.76E-05	4.55E-05	3.44E-05	2.95E-05	4.13E-05	8.86E-05	2.33E-04	4.17E-04	3.88E-04	3.32E-04	3.11E-04	2.67E-04	2.43E-04	2.56E-04	2.76E-04	3.01E-04	3.37E-04	3.74E-04	3.42E-04	2.52E-04	2.00E-04	1.80E-04	1.49E-04
	Emission in each Box of 2nd jet	g/s	1.50E-04	1.18E-04	7.96E-05	6.02E-05	5.16E-05	7.22E-05	1.55E-04	4.08E-04	7.30E-04	6.79E-04	5.81E-04	5.44E-04	4.67E-04	4.26E-04	4.48E-04	4.83E-04	5.27E-04	5.91E-04	6.55E-04	5.98E-04	4.42E-04	3.50E-04	3.15E-04	2.61E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2310	0.2028	0.2007	0.2147	0.2216	0.3712	0.3882	0.3355	0.3519	0.3375	0.3161	0.3105	0.3135	0.3098	0.3048	0.3129	0.3220	0.3416	0.3468	0.3301	0.3028	0.3074	0.2983	0.2799
	NO2	g/vehicle/km	0.0452	0.0442	0.0434	0.0447	0.0458	0.0535	0.0539	0.0568	0.0681	0.0655	0.0613	0.0596	0.0533	0.0518	0.0514	0.0529	0.0548	0.0580	0.0598	0.0577	0.0514	0.0494	0.0477	0.0454
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0050***	***0.0036***	***0.0024***	***0.0019***	***0.0017***	***0.0034***	***0.0075***	***0.0161***	***0.0253***	***0.0235***	***0.0202***	***0.0190***	***0.0182***	***0.0169***	***0.0176***	***0.0189***	***0.0204***	***0.0233***	***0.0249***	***0.0228***	***0.0172***	***0.0144***	***0.0130***	***0.0107***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.34E-03	2.39E-03	1.62E-03	1.29E-03	1.11E-03	2.24E-03	4.99E-03	1.07E-02	1.69E-02	1.57E-02	1.35E-02	1.27E-02	1.21E-02	1.12E-02	1.17E-02	1.26E-02	1.36E-02	1.55E-02	1.66E-02	1.52E-02	1.15E-02	9.60E-03	8.70E-03	7.14E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.67E-03	1.19E-03	8.11E-04	6.43E-04	5.57E-04	1.12E-03	2.50E-03	5.37E-03	8.44E-03	7.85E-03	6.73E-03	6.33E-03	6.07E-03	5.62E-03	5.85E-03	6.31E-03	6.79E-03	7.75E-03	8.31E-03	7.59E-03	5.74E-03	4.80E-03	4.35E-03	3.57E-03
	Emission in each Box of 1st jet	g/s	4.77E-04	3.41E-04	2.32E-04	1.84E-04	1.59E-04	3.21E-04	7.13E-04	1.53E-03	2.41E-03	2.24E-03	1.92E-03	1.81E-03	1.73E-03	1.60E-03	1.67E-03	1.80E-03	1.94E-03	2.22E-03	2.37E-03	2.17E-03	1.64E-03	1.37E-03	1.24E-03	1.02E-03
	Emission in each Box of 2nd jet	g/s	8.35E-04	5.97E-04	4.06E-04	3.22E-04	2.79E-04	5.61E-04	1.25E-03	2.68E-03	4.22E-03	3.92E-03	3.37E-03	3.16E-03	3.03E-03	2.81E-03	2.93E-03	3.15E-03	3.40E-03	3.88E-03	4.16E-03	3.79E-03	2.87E-03	2.40E-03	2.17E-03	1.78E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0027***	***0.0049***	***0.0046***	***0.0039***	***0.0036***	***0.0031***	***0.0028***	***0.0030***	***0.0032***	***0.0035***	***0.0040***	***0.0043***	***0.0040***	***0.0029***	***0.0023***	***0.0021***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.53E-04	5.21E-04	3.51E-04	2.68E-04	2.30E-04	3.23E-04	6.94E-04	1.82E-03	3.26E-03	3.05E-03	2.61E-03	2.43E-03	2.06E-03	1.88E-03	1.97E-03	2.13E-03	2.31E-03	2.64E-03	2.87E-03	2.65E-03	1.95E-03	1.54E-03	1.39E-03	1.16E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.27E-04	2.60E-04	1.76E-04	1.34E-04	1.15E-04	1.62E-04	3.47E-04	9.08E-04	1.63E-03	1.52E-03	1.30E-03	1.21E-03	1.03E-03	9.38E-04	9.87E-04	1.07E-03	1.16E-03	1.32E-03	1.43E-03	1.33E-03	9.74E-04	7.72E-04	6.95E-04	5.78E-04
	Emission in each Box of 1st jet	g/s	9.33E-05	7.44E-05	5.02E-05	3.83E-05	3.29E-05	4.62E-05	9.91E-05	2.60E-04	4.66E-04	4.35E-04	3.73E-04	3.47E-04	2.95E-04	2.68E-04	2.82E-04	3.04E-04	3.31E-04	3.77E-04	4.09E-04	3.79E-04	2.78E-04	2.21E-04	1.99E-04	1.65E-04
	Emission in each Box of 2nd jet	g/s	1.63E-04	1.30E-04	8.78E-05	6.70E-05	5.76E-05	8.09E-05	1.73E-04	4.54E-04	8.16E-04	7.61E-04	6.52E-04	6.07E-04	5.16E-04	4.69E-04	4.93E-04	5.33E-04	5.78E-04	6.59E-04	7.17E-04	6.63E-04	4.87E-04	3.86E-04	3.47E-04	2.89E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2433	0.2121	0.2102	0.2234	0.2332	0.3885	0.4051	0.3497	0.3665	0.3510	0.3281	0.3229	0.3254	0.3215	0.3173	0.3251	0.3343	0.3537	0.3627	0.3410	0.3139	0.3179	0.3124	0.2932
	NO2	g/vehicle/km	0.0473	0.0459	0.0451	0.0462	0.0479	0.0557	0.0560	0.0589	0.0706	0.0679	0.0634	0.0617	0.0551	0.0536	0.0534	0.0548	0.0567	0.0599	0.0623	0.0594	0.0531	0.0509	0.0497	0.0473
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0053***	***0.0037***	***0.0025***	***0.0020***	***0.0018***	***0.0035***	***0.0078***	***0.0168***	***0.0264***	***0.0245***	***0.0210***	***0.0197***	***0.0189***	***0.0175***	***0.0183***	***0.0197***	***0.0212***	***0.0241***	***0.0261***	***0.0235***	***0.0178***	***0.0149***	***0.0137***	***0.0112***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.52E-03	2.50E-03	1.70E-03	1.34E-03	1.17E-03	2.35E-03	5.21E-03	1.12E-02	1.76E-02	1.63E-02	1.40E-02	1.32E-02	1.26E-02	1.17E-02	1.22E-02	1.31E-02	1.41E-02	1.61E-02	1.74E-02	1.57E-02	1.19E-02	9.93E-03	9.11E-03	7.48E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.76E-03	1.25E-03	8.49E-04	6.69E-04	5.87E-04	1.17E-03	2.60E-03	5.59E-03	8.79E-03	8.16E-03	6.99E-03	6.58E-03	6.30E-03	5.83E-03	6.10E-03	6.55E-03	7.05E-03	8.03E-03	8.69E-03	7.84E-03	5.95E-03	4.97E-03	4.55E-03	3.74E-03
	Emission in each Box of 1st jet	g/s	5.03E-04	3.57E-04	2.43E-04	1.91E-04	1.68E-04	3.36E-04	7.44E-04	1.60E-03	2.51E-03	2.33E-03	2.00E-03	1.88E-03	1.80E-03	1.67E-03	1.74E-03	1.87E-03	2.01E-03	2.29E-03	2.48E-03	2.24E-03	1.70E-03	1.42E-03	1.30E-03	1.07E-03
	Emission in each Box of 2nd jet	g/s	8.80E-04	6.25E-04	4.25E-04	3.35E-04	2.93E-04	5.87E-04	1.30E-03	2.80E-03	4.39E-03	4.08E-03	3.49E-03	3.29E-03	3.15E-03	2.92E-03	3.05E-03	3.28E-03	3.53E-03	4.01E-03	4.35E-03	3.92E-03	2.97E-03	2.48E-03	2.28E-03	1.87E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0028***	***0.0051***	***0.0047***	***0.0041***	***0.0038***	***0.0032***	***0.0029***	***0.0031***	***0.0033***	***0.0036***	***0.0041***	***0.0045***	***0.0041***	***0.0030***	***0.0024***	***0.0022***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.84E-04	5.41E-04	3.65E-04	2.77E-04	2.41E-04	3.37E-04	7.21E-04	1.89E-03	3.39E-03	3.16E-03	2.70E-03	2.52E-03	2.13E-03	1.94E-03	2.05E-03	2.21E-03	2.39E-03	2.72E-03	2.99E-03	2.73E-03	2.01E-03	1.59E-03	1.45E-03	1.21E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.42E-04	2.70E-04	1.82E-04	1.38E-04	1.20E-04	1.69E-04	3.60E-04	9.43E-04	1.69E-03	1.58E-03	1.35E-03	1.26E-03	1.07E-03	9.72E-04	1.02E-03	1.10E-03	1.20E-03	1.36E-03	1.49E-03	1.36E-03	1.01E-03	7.96E-04	7.24E-04	6.03E-04
	Emission in each Box of 1st jet	g/s	9.78E-05	7.73E-05	5.21E-05	3.96E-05	3.44E-05	4.81E-05	1.03E-04	2.69E-04	4.84E-04	4.51E-04	3.86E-04	3.60E-04	3.05E-04	2.78E-04	2.93E-04	3.16E-04	3.42E-04	3.89E-04	4.27E-04	3.90E-04	2.88E-04	2.27E-04	2.07E-04	1.72E-04
	Emission in each Box of 2nd jet	g/s	1.71E-04	1.35E-04	9.12E-05	6.92E-05	6.02E-05	8.43E-05	1.80E-04	4.71E-04	8.47E-04	7.89E-04	6.75E-04	6.29E-04	5.34E-04	4.86E-04	5.12E-04	5.52E-04	5.99E-04	6.80E-04	7.46E-04	6.82E-04	5.03E-04	3.98E-04	3.62E-04	3.02E-04
RSP Emission Rate		g/s	***3.00E-04***	***2.05E-04***	***1.39E-04***	***1.11E-04***	***9.73E-05***	***2.11E-04***	***4.71E-04***	***9.30E-04***	***1.30E-03***	***1.22E-03***	***1.10E-03***	***1.05E-03***	***1.05E-03***	***9.86E-04***	***1.02E-03***	***1.10E-03***	***1.17E-03***	***1.29E-03***	***1.37E-03***	***1.25E-03***	***1.00E-03***	***8.62E-04***	***7.89E-04***	***6.51E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.00E-04	1.37E-04	9.27E-05	7.43E-05	6.48E-05	1.41E-04	3.14E-04	6.20E-04	8.65E-04	8.13E-04	7.34E-04	6.98E-04	7.03E-04	6.57E-04	6.83E-04	7.33E-04	7.80E-04	8.60E-04	9.12E-04	8.30E-04	6.68E-04	5.75E-04	5.26E-04	4.34E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	9.99E-05	6.84E-05	4.64E-05	3.72E-05	3.24E-05	7.04E-05	1.57E-04	3.10E-04	4.32E-04	4.06E-04	3.67E-04	3.49E-04	3.51E-04	3.29E-04	3.41E-04	3.67E-04	3.90E-04	4.30E-04	4.56E-04	4.15E-04	3.34E-04	2.87E-04	2.63E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.85E-05	1.96E-05	1.32E-05	1.06E-05	9.26E-06	2.01E-05	4.48E-05	8.86E-05	1.24E-04	1.16E-04	1.05E-04	9.97E-05	1.00E-04	9.39E-05	9.76E-05	1.05E-04	1.11E-04	1.23E-04	1.30E-04	1.19E-04	9.54E-05	8.21E-05	7.52E-05	6.20E-05
	Emission in each Box of 2nd jet	g/s	4.99E-05	3.42E-05	2.32E-05	1.86E-05	1.62E-05	3.52E-05	7.84E-05	1.55E-04	2.16E-04	2.03E-04	1.84E-04	1.74E-04	1.76E-04	1.64E-04	1.71E-04	1.83E-04	1.95E-04	2.15E-04	2.28E-04	2.08E-04	1.67E-04	1.44E-04	1.32E-04	1.08E-04
FSP Emission Rate		g/s	***2.75E-04***	***1.89E-04***	***1.28E-04***	***1.02E-04***	***8.94E-05***	***1.94E-04***	***4.33E-04***	***8.57E-04***	***1.19E-03***	***1.12E-03***	***1.01E-03***	***9.62E-04***	***9.68E-04***	***9.09E-04***	***9.44E-04***	***1.01E-03***	***1.08E-03***	***1.19E-03***	***1.26E-03***	***1.15E-03***	***9.23E-04***	***7.94E-04***	***7.28E-04***	***5.99E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.84E-04	1.26E-04	8.53E-05	6.83E-05	5.96E-05	1.29E-04	2.88E-04	5.71E-04	7.95E-04	7.47E-04	6.75E-04	6.41E-04	6.46E-04	6.06E-04	6.29E-04	6.74E-04	7.17E-04	7.91E-04	8.39E-04	7.64E-04	6.15E-04	5.29E-04	4.85E-04	4.00E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.18E-05	6.29E-05	4.26E-05	3.42E-05	2.98E-05	6.47E-05	1.44E-04	2.86E-04	3.98E-04	3.74E-04	3.38E-04	3.21E-04	3.23E-04	3.03E-04	3.15E-04	3.37E-04	3.59E-04	3.96E-04	4.19E-04	3.82E-04	3.08E-04	2.65E-04	2.43E-04	2.00E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	1.80E-05	1.22E-05	9.76E-06	8.52E-06	1.85E-05	4.12E-05	8.16E-05	1.14E-04	1.07E-04	9.65E-05	9.16E-05	9.22E-05	8.65E-05	8.99E-05	9.63E-05	1.02E-04	1.13E-04	1.20E-04	1.09E-04	8.79E-05	7.56E-05	6.93E-05	5.71E-05
	Emission in each Box of 2nd jet	g/s	4.59E-05	3.15E-05	2.13E-05	1.71E-05	1.49E-05	3.23E-05	7.21E-05	1.43E-04	1.99E-04	1.87E-04	1.69E-04	1.60E-04	1.61E-04	1.51E-04	1.57E-04	1.69E-04	1.79E-04	1.98E-04	2.10E-04	1.91E-04	1.54E-04	1.32E-04	1.21E-04	9.99E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2558	0.2239	0.2224	0.2364	0.2444	0.4065	0.4268	0.3656	0.3850	0.3693	0.3485	0.3402	0.3468	0.3411	0.3330	0.3451	0.3552	0.3736	0.3808	0.3582	0.3301	0.3345	0.3283	0.3076
	NO2	g/vehicle/km	0.0495	0.0481	0.0474	0.0486	0.0498	0.0581	0.0588	0.0614	0.0738	0.0711	0.0670	0.0648	0.0584	0.0566	0.0558	0.0579	0.0600	0.0630	0.0651	0.0621	0.0556	0.0533	0.0519	0.0494
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0120***	***0.0086***	***0.0058***	***0.0046***	***0.0040***	***0.0080***	***0.0178***	***0.0380***	***0.0599***	***0.0558***	***0.0482***	***0.0450***	***0.0436***	***0.0402***	***0.0415***	***0.0452***	***0.0487***	***0.0551***	***0.0593***	***0.0535***	***0.0406***	***0.0339***	***0.0311***	***0.0255***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.01E-03	5.71E-03	3.89E-03	3.07E-03	2.66E-03	5.32E-03	1.19E-02	2.53E-02	4.00E-02	3.72E-02	3.21E-02	3.00E-02	2.91E-02	2.68E-02	2.77E-02	3.01E-02	3.25E-02	3.67E-02	3.95E-02	3.57E-02	2.71E-02	2.26E-02	2.07E-02	1.70E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.00E-03	2.86E-03	1.95E-03	1.53E-03	1.33E-03	2.66E-03	5.94E-03	1.27E-02	2.00E-02	1.86E-02	1.61E-02	1.50E-02	1.45E-02	1.34E-02	1.38E-02	1.51E-02	1.62E-02	1.84E-02	1.98E-02	1.78E-02	1.35E-02	1.13E-02	1.04E-02	8.49E-03
	Emission in each Box of 1st jet	g/s	1.00E-03	7.14E-04	4.87E-04	3.83E-04	3.33E-04	6.65E-04	1.49E-03	3.17E-03	5.00E-03	4.65E-03	4.02E-03	3.75E-03	3.63E-03	3.35E-03	3.46E-03	3.77E-03	4.06E-03	4.59E-03	4.94E-03	4.46E-03	3.38E-03	2.83E-03	2.59E-03	2.12E-03
	Emission in each Box of 2nd jet	g/s	5.72E-04	4.08E-04	2.78E-04	2.19E-04	1.90E-04	3.80E-04	8.49E-04	1.81E-03	2.85E-03	2.66E-03	2.30E-03	2.14E-03	2.08E-03	1.91E-03	1.98E-03	2.15E-03	2.32E-03	2.62E-03	2.82E-03	2.55E-03	1.93E-03	1.62E-03	1.48E-03	1.21E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0025***	***0.0064***	***0.0115***	***0.0107***	***0.0093***	***0.0086***	***0.0073***	***0.0067***	***0.0070***	***0.0076***	***0.0082***	***0.0093***	***0.0101***	***0.0093***	***0.0068***	***0.0054***	***0.0049***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.55E-03	1.23E-03	8.30E-04	6.30E-04	5.42E-04	7.60E-04	1.64E-03	4.25E-03	7.67E-03	7.16E-03	6.18E-03	5.72E-03	4.90E-03	4.44E-03	4.64E-03	5.05E-03	5.48E-03	6.19E-03	6.75E-03	6.19E-03	4.56E-03	3.61E-03	3.28E-03	2.73E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.75E-04	6.14E-04	4.15E-04	3.15E-04	2.71E-04	3.80E-04	8.18E-04	2.13E-03	3.83E-03	3.58E-03	3.09E-03	2.86E-03	2.45E-03	2.22E-03	2.32E-03	2.53E-03	2.74E-03	3.10E-03	3.38E-03	3.09E-03	2.28E-03	1.80E-03	1.64E-03	1.36E-03
	Emission in each Box of 1st jet	g/s	1.94E-04	1.53E-04	1.04E-04	7.87E-05	6.78E-05	9.51E-05	2.04E-04	5.31E-04	9.58E-04	8.95E-04	7.72E-04	7.15E-04	6.12E-04	5.55E-04	5.80E-04	6.32E-04	6.85E-04	7.74E-04	8.44E-04	7.73E-04	5.70E-04	4.51E-04	4.10E-04	3.41E-04
	Emission in each Box of 2nd jet	g/s	1.11E-04	8.77E-05	5.93E-05	4.50E-05	3.87E-05	5.43E-05	1.17E-04	3.04E-04	5.48E-04	5.11E-04	4.41E-04	4.09E-04	3.50E-04	3.17E-04	3.32E-04	3.61E-04	3.91E-04	4.42E-04	4.82E-04	4.42E-04	3.26E-04	2.58E-04	2.34E-04	1.95E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2395	0.2078	0.2058	0.2213	0.2284	0.3805	0.3959	0.3425	0.3574	0.3387	0.3216	0.3139	0.3197	0.3169	0.3118	0.3203	0.3294	0.3484	0.3548	0.3360	0.3093	0.3140	0.3049	0.2855
	NO2	g/vehicle/km	0.0466	0.0451	0.0443	0.0458	0.0469	0.0546	0.0548	0.0578	0.0690	0.0657	0.0623	0.0602	0.0543	0.0529	0.0525	0.0541	0.0560	0.0591	0.0610	0.0586	0.0524	0.0504	0.0485	0.0461
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0112***	***0.0080***	***0.0054***	***0.0043***	***0.0037***	***0.0075***	***0.0165***	***0.0356***	***0.0556***	***0.0512***	***0.0445***	***0.0416***	***0.0402***	***0.0373***	***0.0389***	***0.0419***	***0.0451***	***0.0514***	***0.0552***	***0.0502***	***0.0381***	***0.0319***	***0.0289***	***0.0236***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.50E-03	5.30E-03	3.60E-03	2.87E-03	2.49E-03	4.98E-03	1.10E-02	2.37E-02	3.71E-02	3.41E-02	2.97E-02	2.77E-02	2.68E-02	2.49E-02	2.59E-02	2.80E-02	3.01E-02	3.43E-02	3.68E-02	3.34E-02	2.54E-02	2.12E-02	1.93E-02	1.58E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.75E-03	2.65E-03	1.80E-03	1.43E-03	1.24E-03	2.49E-03	5.51E-03	1.19E-02	1.85E-02	1.71E-02	1.48E-02	1.39E-02	1.34E-02	1.24E-02	1.30E-02	1.40E-02	1.50E-02	1.71E-02	1.84E-02	1.67E-02	1.27E-02	1.06E-02	9.63E-03	7.88E-03
	Emission in each Box of 1st jet	g/s	9.37E-04	6.63E-04	4.50E-04	3.59E-04	3.11E-04	6.23E-04	1.38E-03	2.97E-03	4.64E-03	4.26E-03	3.71E-03	3.46E-03	3.35E-03	3.11E-03	3.24E-03	3.50E-03	3.76E-03	4.28E-03	4.60E-03	4.18E-03	3.17E-03	2.65E-03	2.41E-03	1.97E-03
	Emission in each Box of 2nd jet	g/s	5.36E-04	3.79E-04	2.57E-04	2.05E-04	1.78E-04	3.56E-04	7.87E-04	1.69E-03	2.65E-03	2.44E-03	2.12E-03	1.98E-03	1.91E-03	1.78E-03	1.85E-03	2.00E-03	2.15E-03	2.45E-03	2.63E-03	2.39E-03	1.81E-03	1.52E-03	1.38E-03	1.13E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0023***	***0.0060***	***0.0107***	***0.0099***	***0.0086***	***0.0080***	***0.0068***	***0.0062***	***0.0066***	***0.0071***	***0.0077***	***0.0087***	***0.0095***	***0.0087***	***0.0065***	***0.0051***	***0.0046***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.46E-03	1.15E-03	7.75E-04	5.93E-04	5.11E-04	7.15E-04	1.53E-03	4.00E-03	7.17E-03	6.61E-03	5.74E-03	5.31E-03	4.55E-03	4.15E-03	4.37E-03	4.72E-03	5.11E-03	5.81E-03	6.33E-03	5.83E-03	4.30E-03	3.41E-03	3.06E-03	2.55E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.30E-04	5.75E-04	3.88E-04	2.97E-04	2.55E-04	3.57E-04	7.63E-04	2.00E-03	3.58E-03	3.31E-03	2.87E-03	2.66E-03	2.27E-03	2.08E-03	2.18E-03	2.36E-03	2.56E-03	2.90E-03	3.16E-03	2.92E-03	2.15E-03	1.70E-03	1.53E-03	1.27E-03
	Emission in each Box of 1st jet	g/s	1.82E-04	1.44E-04	9.69E-05	7.42E-05	6.38E-05	8.94E-05	1.91E-04	5.00E-04	8.96E-04	8.27E-04	7.18E-04	6.64E-04	5.68E-04	5.19E-04	5.46E-04	5.90E-04	6.39E-04	7.26E-04	7.91E-04	7.29E-04	5.38E-04	4.26E-04	3.83E-04	3.18E-04
	Emission in each Box of 2nd jet	g/s	1.04E-04	8.21E-05	5.54E-05	4.24E-05	3.65E-05	5.11E-05	1.09E-04	2.86E-04	5.12E-04	4.72E-04	4.10E-04	3.79E-04	3.25E-04	2.97E-04	3.12E-04	3.37E-04	3.65E-04	4.15E-04	4.52E-04	4.16E-04	3.07E-04	2.43E-04	2.19E-04	1.82E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2263	0.1965	0.1951	0.2068	0.2134	0.3568	0.3722	0.3226	0.3374	0.3227	0.3030	0.2997	0.3050	0.2977	0.2929	0.3046	0.3099	0.3296	0.3379	0.3173	0.2909	0.2954	0.2866	0.2690
	NO2	g/vehicle/km	0.0443	0.0429	0.0422	0.0431	0.0442	0.0515	0.0518	0.0547	0.0654	0.0627	0.0588	0.0575	0.0519	0.0499	0.0495	0.0515	0.0528	0.0561	0.0583	0.0556	0.0495	0.0476	0.0458	0.0437
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0106***	***0.0075***	***0.0051***	***0.0040***	***0.0035***	***0.0070***	***0.0155***	***0.0335***	***0.0525***	***0.0487***	***0.0419***	***0.0397***	***0.0383***	***0.0351***	***0.0365***	***0.0399***	***0.0425***	***0.0486***	***0.0526***	***0.0474***	***0.0358***	***0.0300***	***0.0271***	***0.0223***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.09E-03	5.01E-03	3.41E-03	2.68E-03	2.32E-03	4.67E-03	1.04E-02	2.23E-02	3.50E-02	3.25E-02	2.79E-02	2.64E-02	2.56E-02	2.34E-02	2.44E-02	2.66E-02	2.83E-02	3.24E-02	3.51E-02	3.16E-02	2.39E-02	2.00E-02	1.81E-02	1.49E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.54E-03	2.51E-03	1.71E-03	1.34E-03	1.16E-03	2.34E-03	5.18E-03	1.12E-02	1.75E-02	1.62E-02	1.40E-02	1.32E-02	1.28E-02	1.17E-02	1.22E-02	1.33E-02	1.42E-02	1.62E-02	1.75E-02	1.58E-02	1.19E-02	9.99E-03	9.05E-03	7.43E-03
	Emission in each Box of 1st jet	g/s	8.86E-04	6.27E-04	4.27E-04	3.35E-04	2.91E-04	5.84E-04	1.30E-03	2.79E-03	4.38E-03	4.06E-03	3.49E-03	3.31E-03	3.20E-03	2.92E-03	3.05E-03	3.32E-03	3.54E-03	4.05E-03	4.38E-03	3.95E-03	2.98E-03	2.50E-03	2.26E-03	1.86E-03
	Emission in each Box of 2nd jet	g/s	5.06E-04	3.58E-04	2.44E-04	1.92E-04	1.66E-04	3.34E-04	7.40E-04	1.60E-03	2.50E-03	2.32E-03	2.00E-03	1.89E-03	1.83E-03	1.67E-03	1.74E-03	1.90E-03	2.02E-03	2.31E-03	2.50E-03	2.26E-03	1.70E-03	1.43E-03	1.29E-03	1.06E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0022***	***0.0057***	***0.0102***	***0.0095***	***0.0081***	***0.0076***	***0.0065***	***0.0059***	***0.0062***	***0.0067***	***0.0072***	***0.0083***	***0.0091***	***0.0083***	***0.0061***	***0.0048***	***0.0043***	***0.0036***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.39E-03	1.09E-03	7.39E-04	5.59E-04	4.81E-04	6.74E-04	1.44E-03	3.79E-03	6.79E-03	6.31E-03	5.42E-03	5.08E-03	4.35E-03	3.92E-03	4.12E-03	4.50E-03	4.83E-03	5.51E-03	6.05E-03	5.53E-03	4.06E-03	3.22E-03	2.89E-03	2.41E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.93E-04	5.47E-04	3.70E-04	2.80E-04	2.41E-04	3.37E-04	7.21E-04	1.89E-03	3.40E-03	3.16E-03	2.71E-03	2.54E-03	2.17E-03	1.96E-03	2.06E-03	2.25E-03	2.41E-03	2.76E-03	3.03E-03	2.77E-03	2.03E-03	1.61E-03	1.45E-03	1.21E-03
	Emission in each Box of 1st jet	g/s	1.73E-04	1.37E-04	9.24E-05	6.99E-05	6.02E-05	8.43E-05	1.80E-04	4.74E-04	8.49E-04	7.89E-04	6.78E-04	6.35E-04	5.43E-04	4.90E-04	5.15E-04	5.62E-04	6.03E-04	6.89E-04	7.57E-04	6.91E-04	5.08E-04	4.02E-04	3.62E-04	3.01E-04
	Emission in each Box of 2nd jet	g/s	9.90E-05	7.81E-05	5.28E-05	4.00E-05	3.44E-05	4.81E-05	1.03E-04	2.71E-04	4.85E-04	4.51E-04	3.87E-04	3.63E-04	3.10E-04	2.80E-04	2.94E-04	3.21E-04	3.45E-04	3.94E-04	4.32E-04	3.95E-04	2.90E-04	2.30E-04	2.07E-04	1.72E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2128	0.1846	0.1825	0.1981	0.2044	0.3434	0.3583	0.3075	0.3217	0.3077	0.2886	0.2850	0.2899	0.2878	0.2831	0.2892	0.3004	0.3136	0.3217	0.3005	0.2761	0.2849	0.2753	0.2574
	NO2	g/vehicle/km	0.0419	0.0405	0.0398	0.0415	0.0425	0.0497	0.0500	0.0523	0.0625	0.0600	0.0562	0.0549	0.0495	0.0483	0.0479	0.0491	0.0513	0.0535	0.0557	0.0529	0.0472	0.0460	0.0442	0.0419
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0100***	***0.0071***	***0.0048***	***0.0039***	***0.0033***	***0.0067***	***0.0150***	***0.0320***	***0.0501***	***0.0465***	***0.0399***	***0.0377***	***0.0364***	***0.0339***	***0.0353***	***0.0379***	***0.0412***	***0.0462***	***0.0501***	***0.0449***	***0.0340***	***0.0289***	***0.0261***	***0.0213***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.66E-03	4.71E-03	3.19E-03	2.57E-03	2.23E-03	4.50E-03	9.97E-03	2.13E-02	3.34E-02	3.10E-02	2.66E-02	2.52E-02	2.43E-02	2.26E-02	2.35E-02	2.52E-02	2.74E-02	3.08E-02	3.34E-02	2.99E-02	2.26E-02	1.93E-02	1.74E-02	1.42E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.33E-03	2.35E-03	1.60E-03	1.28E-03	1.11E-03	2.25E-03	4.99E-03	1.07E-02	1.67E-02	1.55E-02	1.33E-02	1.26E-02	1.21E-02	1.13E-02	1.18E-02	1.26E-02	1.37E-02	1.54E-02	1.67E-02	1.50E-02	1.13E-02	9.63E-03	8.69E-03	7.11E-03
	Emission in each Box of 1st jet	g/s	8.33E-04	5.89E-04	3.99E-04	3.21E-04	2.78E-04	5.62E-04	1.25E-03	2.66E-03	4.18E-03	3.87E-03	3.33E-03	3.14E-03	3.04E-03	2.82E-03	2.94E-03	3.16E-03	3.43E-03	3.85E-03	4.17E-03	3.74E-03	2.83E-03	2.41E-03	2.17E-03	1.78E-03
	Emission in each Box of 2nd jet	g/s	4.76E-04	3.36E-04	2.28E-04	1.83E-04	1.59E-04	3.21E-04	7.12E-04	1.52E-03	2.39E-03	2.21E-03	1.90E-03	1.80E-03	1.74E-03	1.61E-03	1.68E-03	1.80E-03	1.96E-03	2.20E-03	2.38E-03	2.14E-03	1.62E-03	1.38E-03	1.24E-03	1.02E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0010***	***0.0008***	***0.0007***	***0.0010***	***0.0021***	***0.0054***	***0.0097***	***0.0091***	***0.0078***	***0.0073***	***0.0062***	***0.0057***	***0.0060***	***0.0064***	***0.0070***	***0.0079***	***0.0087***	***0.0079***	***0.0058***	***0.0047***	***0.0042***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.31E-03	1.03E-03	6.96E-04	5.38E-04	4.63E-04	6.50E-04	1.39E-03	3.62E-03	6.49E-03	6.04E-03	5.18E-03	4.84E-03	4.15E-03	3.79E-03	3.99E-03	4.29E-03	4.69E-03	5.26E-03	5.78E-03	5.26E-03	3.87E-03	3.11E-03	2.79E-03	2.31E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.55E-04	5.17E-04	3.48E-04	2.69E-04	2.31E-04	3.25E-04	6.95E-04	1.81E-03	3.24E-03	3.02E-03	2.59E-03	2.42E-03	2.07E-03	1.90E-03	1.99E-03	2.14E-03	2.34E-03	2.63E-03	2.89E-03	2.63E-03	1.93E-03	1.56E-03	1.39E-03	1.16E-03
	Emission in each Box of 1st jet	g/s	1.64E-04	1.29E-04	8.70E-05	6.73E-05	5.79E-05	8.13E-05	1.74E-04	4.53E-04	8.11E-04	7.55E-04	6.47E-04	6.05E-04	5.18E-04	4.74E-04	4.98E-04	5.36E-04	5.86E-04	6.58E-04	7.22E-04	6.58E-04	4.84E-04	3.89E-04	3.49E-04	2.89E-04
	Emission in each Box of 2nd jet	g/s	9.36E-05	7.39E-05	4.97E-05	3.84E-05	3.31E-05	4.65E-05	9.94E-05	2.59E-04	4.64E-04	4.31E-04	3.70E-04	3.46E-04	2.96E-04	2.71E-04	2.85E-04	3.06E-04	3.35E-04	3.76E-04	4.13E-04	3.76E-04	2.76E-04	2.22E-04	1.99E-04	1.65E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1916	0.1651	0.1637	0.1731	0.1787	0.3001	0.3094	0.2676	0.2837	0.2699	0.2574	0.2536	0.2595	0.2564	0.2540	0.2583	0.2675	0.2835	0.2836	0.2698	0.2473	0.2482	0.2417	0.2256
	NO2	g/vehicle/km	0.0379	0.0365	0.0360	0.0366	0.0375	0.0437	0.0434	0.0458	0.0554	0.0529	0.0503	0.0491	0.0445	0.0432	0.0432	0.0441	0.0459	0.0486	0.0494	0.0477	0.0425	0.0404	0.0391	0.0370
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0090***	***0.0063***	***0.0043***	***0.0034***	***0.0029***	***0.0059***	***0.0129***	***0.0278***	***0.0442***	***0.0408***	***0.0356***	***0.0336***	***0.0326***	***0.0302***	***0.0317***	***0.0338***	***0.0367***	***0.0418***	***0.0441***	***0.0403***	***0.0304***	***0.0252***	***0.0229***	***0.0187***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.00E-03	4.21E-03	2.86E-03	2.24E-03	1.95E-03	3.93E-03	8.61E-03	1.85E-02	2.95E-02	2.72E-02	2.37E-02	2.24E-02	2.17E-02	2.01E-02	2.11E-02	2.25E-02	2.44E-02	2.79E-02	2.94E-02	2.69E-02	2.03E-02	1.68E-02	1.53E-02	1.25E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.00E-03	2.11E-03	1.43E-03	1.12E-03	9.73E-04	1.96E-03	4.31E-03	9.27E-03	1.47E-02	1.36E-02	1.19E-02	1.12E-02	1.09E-02	1.01E-02	1.06E-02	1.13E-02	1.22E-02	1.39E-02	1.47E-02	1.34E-02	1.01E-02	8.39E-03	7.63E-03	6.23E-03
	Emission in each Box of 1st jet	g/s	7.50E-04	5.26E-04	3.58E-04	2.81E-04	2.43E-04	4.91E-04	1.08E-03	2.32E-03	3.68E-03	3.40E-03	2.97E-03	2.80E-03	2.72E-03	2.52E-03	2.64E-03	2.82E-03	3.05E-03	3.48E-03	3.68E-03	3.36E-03	2.54E-03	2.10E-03	1.91E-03	1.56E-03
	Emission in each Box of 2nd jet	g/s	4.29E-04	3.01E-04	2.05E-04	1.60E-04	1.39E-04	2.81E-04	6.15E-04	1.32E-03	2.10E-03	1.94E-03	1.70E-03	1.60E-03	1.55E-03	1.44E-03	1.51E-03	1.61E-03	1.75E-03	1.99E-03	2.10E-03	1.92E-03	1.45E-03	1.20E-03	1.09E-03	8.89E-04
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0009***	***0.0018***	***0.0048***	***0.0086***	***0.0080***	***0.0070***	***0.0065***	***0.0056***	***0.0051***	***0.0054***	***0.0058***	***0.0063***	***0.0072***	***0.0077***	***0.0071***	***0.0052***	***0.0041***	***0.0037***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.19E-03	9.32E-04	6.30E-04	4.75E-04	4.08E-04	5.72E-04	1.21E-03	3.17E-03	5.75E-03	5.32E-03	4.64E-03	4.33E-03	3.73E-03	3.40E-03	3.59E-03	3.85E-03	4.20E-03	4.78E-03	5.13E-03	4.75E-03	3.49E-03	2.73E-03	2.47E-03	2.04E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.93E-04	4.66E-04	3.15E-04	2.37E-04	2.04E-04	2.86E-04	6.04E-04	1.59E-03	2.88E-03	2.66E-03	2.32E-03	2.16E-03	1.86E-03	1.70E-03	1.80E-03	1.92E-03	2.10E-03	2.39E-03	2.56E-03	2.37E-03	1.74E-03	1.37E-03	1.23E-03	1.02E-03
	Emission in each Box of 1st jet	g/s	1.48E-04	1.16E-04	7.87E-05	5.93E-05	5.11E-05	7.15E-05	1.51E-04	3.96E-04	7.19E-04	6.66E-04	5.80E-04	5.41E-04	4.66E-04	4.24E-04	4.49E-04	4.81E-04	5.25E-04	5.97E-04	6.41E-04	5.93E-04	4.36E-04	3.41E-04	3.08E-04	2.55E-04
	Emission in each Box of 2nd jet	g/s	8.48E-05	6.66E-05	4.50E-05	3.39E-05	2.92E-05	4.09E-05	8.63E-05	2.27E-04	4.11E-04	3.80E-04	3.31E-04	3.09E-04	2.66E-04	2.43E-04	2.57E-04	2.75E-04	3.00E-04	3.41E-04	3.66E-04	3.39E-04	2.49E-04	1.95E-04	1.76E-04	1.46E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1851	0.1603	0.1628	0.1722	0.1768	0.2969	0.3022	0.2644	0.2777	0.2696	0.2494	0.2457	0.2496	0.2483	0.2426	0.2501	0.2632	0.2768	0.2785	0.2668	0.2444	0.2467	0.2388	0.2242
	NO2	g/vehicle/km	0.0366	0.0355	0.0358	0.0364	0.0371	0.0433	0.0425	0.0453	0.0543	0.0528	0.0488	0.0476	0.0429	0.0419	0.0414	0.0428	0.0452	0.0475	0.0485	0.0471	0.0421	0.0402	0.0386	0.0368
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0087***	***0.0061***	***0.0043***	***0.0033***	***0.0029***	***0.0058***	***0.0126***	***0.0275***	***0.0432***	***0.0407***	***0.0345***	***0.0325***	***0.0314***	***0.0292***	***0.0303***	***0.0328***	***0.0361***	***0.0408***	***0.0433***	***0.0398***	***0.0301***	***0.0250***	***0.0226***	***0.0186***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.79E-03	4.09E-03	2.85E-03	2.23E-03	1.93E-03	3.89E-03	8.41E-03	1.83E-02	2.88E-02	2.71E-02	2.30E-02	2.17E-02	2.09E-02	1.95E-02	2.02E-02	2.18E-02	2.40E-02	2.72E-02	2.89E-02	2.66E-02	2.01E-02	1.67E-02	1.51E-02	1.24E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.90E-03	2.04E-03	1.42E-03	1.12E-03	9.63E-04	1.94E-03	4.21E-03	9.16E-03	1.44E-02	1.36E-02	1.15E-02	1.08E-02	1.05E-02	9.75E-03	1.01E-02	1.09E-02	1.20E-02	1.36E-02	1.44E-02	1.33E-02	1.00E-02	8.34E-03	7.54E-03	6.19E-03
	Emission in each Box of 1st jet	g/s	7.24E-04	5.11E-04	3.56E-04	2.79E-04	2.41E-04	4.86E-04	1.05E-03	2.29E-03	3.60E-03	3.39E-03	2.87E-03	2.71E-03	2.61E-03	2.44E-03	2.52E-03	2.73E-03	3.01E-03	3.40E-03	3.61E-03	3.32E-03	2.51E-03	2.09E-03	1.88E-03	1.55E-03
	Emission in each Box of 2nd jet	g/s	4.14E-04	2.92E-04	2.04E-04	1.59E-04	1.38E-04	2.78E-04	6.01E-04	1.31E-03	2.06E-03	1.94E-03	1.64E-03	1.55E-03	1.49E-03	1.39E-03	1.44E-03	1.56E-03	1.72E-03	1.94E-03	2.06E-03	1.90E-03	1.43E-03	1.19E-03	1.08E-03	8.84E-04
NO_2 Emission Rate		g/s	***0.0017***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0008***	***0.0018***	***0.0047***	***0.0085***	***0.0080***	***0.0068***	***0.0063***	***0.0054***	***0.0049***	***0.0052***	***0.0056***	***0.0062***	***0.0070***	***0.0075***	***0.0070***	***0.0052***	***0.0041***	***0.0037***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.15E-03	9.05E-04	6.26E-04	4.72E-04	4.04E-04	5.66E-04	1.18E-03	3.14E-03	5.63E-03	5.31E-03	4.50E-03	4.20E-03	3.59E-03	3.29E-03	3.44E-03	3.73E-03	4.13E-03	4.66E-03	5.03E-03	4.69E-03	3.45E-03	2.72E-03	2.44E-03	2.03E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.73E-04	4.52E-04	3.13E-04	2.36E-04	2.02E-04	2.83E-04	5.92E-04	1.57E-03	2.82E-03	2.66E-03	2.25E-03	2.10E-03	1.80E-03	1.65E-03	1.72E-03	1.87E-03	2.07E-03	2.33E-03	2.52E-03	2.35E-03	1.72E-03	1.36E-03	1.22E-03	1.02E-03
	Emission in each Box of 1st jet	g/s	1.43E-04	1.13E-04	7.82E-05	5.90E-05	5.05E-05	7.08E-05	1.48E-04	3.92E-04	7.04E-04	6.64E-04	5.63E-04	5.25E-04	4.49E-04	4.12E-04	4.30E-04	4.66E-04	5.17E-04	5.83E-04	6.29E-04	5.86E-04	4.31E-04	3.40E-04	3.05E-04	2.54E-04
	Emission in each Box of 2nd jet	g/s	8.19E-05	6.46E-05	4.47E-05	3.37E-05	2.89E-05	4.05E-05	8.45E-05	2.24E-04	4.02E-04	3.80E-04	3.22E-04	3.00E-04	2.57E-04	2.35E-04	2.46E-04	2.67E-04	2.95E-04	3.33E-04	3.59E-04	3.35E-04	2.46E-04	1.94E-04	1.74E-04	1.45E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1861	0.1593	0.1580	0.1669	0.1723	0.2878	0.3022	0.2579	0.2710	0.2607	0.2504	0.2485	0.2451	0.2439	0.2454	0.2513	0.2585	0.2758	0.2754	0.2637	0.2400	0.2437	0.2358	0.2187
	NO2	g/vehicle/km	0.0368	0.0353	0.0347	0.0354	0.0363	0.0420	0.0425	0.0442	0.0530	0.0511	0.0490	0.0481	0.0421	0.0412	0.0418	0.0429	0.0444	0.0473	0.0480	0.0466	0.0413	0.0397	0.0382	0.0359
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0087***	***0.0061***	***0.0041***	***0.0032***	***0.0028***	***0.0057***	***0.0126***	***0.0268***	***0.0422***	***0.0394***	***0.0346***	***0.0329***	***0.0308***	***0.0287***	***0.0306***	***0.0329***	***0.0354***	***0.0407***	***0.0429***	***0.0394***	***0.0295***	***0.0247***	***0.0223***	***0.0181***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.83E-03	4.06E-03	2.76E-03	2.16E-03	1.88E-03	3.77E-03	8.41E-03	1.79E-02	2.81E-02	2.63E-02	2.31E-02	2.19E-02	2.05E-02	1.91E-02	2.04E-02	2.19E-02	2.36E-02	2.71E-02	2.86E-02	2.63E-02	1.97E-02	1.65E-02	1.49E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.91E-03	2.03E-03	1.38E-03	1.08E-03	9.38E-04	1.88E-03	4.21E-03	8.93E-03	1.41E-02	1.31E-02	1.15E-02	1.10E-02	1.03E-02	9.57E-03	1.02E-02	1.10E-02	1.18E-02	1.36E-02	1.43E-02	1.31E-02	9.85E-03	8.24E-03	7.44E-03	6.04E-03
	Emission in each Box of 1st jet	g/s	7.29E-04	5.08E-04	3.46E-04	2.70E-04	2.35E-04	4.71E-04	1.05E-03	2.23E-03	3.52E-03	3.28E-03	2.89E-03	2.74E-03	2.57E-03	2.39E-03	2.55E-03	2.74E-03	2.95E-03	3.39E-03	3.57E-03	3.28E-03	2.46E-03	2.06E-03	1.86E-03	1.51E-03
	Emission in each Box of 2nd jet	g/s	4.16E-04	2.90E-04	1.97E-04	1.55E-04	1.34E-04	2.69E-04	6.01E-04	1.28E-03	2.01E-03	1.88E-03	1.65E-03	1.57E-03	1.47E-03	1.37E-03	1.46E-03	1.57E-03	1.69E-03	1.94E-03	2.04E-03	1.88E-03	1.41E-03	1.18E-03	1.06E-03	8.62E-04
NO_2 Emission Rate		g/s	***0.0017***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0008***	***0.0018***	***0.0046***	***0.0083***	***0.0077***	***0.0068***	***0.0064***	***0.0053***	***0.0049***	***0.0052***	***0.0056***	***0.0061***	***0.0070***	***0.0075***	***0.0070***	***0.0051***	***0.0040***	***0.0036***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.15E-03	9.00E-04	6.08E-04	4.59E-04	3.95E-04	5.50E-04	1.18E-03	3.06E-03	5.51E-03	5.15E-03	4.52E-03	4.24E-03	3.53E-03	3.24E-03	3.48E-03	3.74E-03	4.06E-03	4.65E-03	4.98E-03	4.64E-03	3.39E-03	2.69E-03	2.41E-03	1.98E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.77E-04	4.50E-04	3.04E-04	2.30E-04	1.97E-04	2.75E-04	5.92E-04	1.53E-03	2.75E-03	2.57E-03	2.26E-03	2.12E-03	1.76E-03	1.62E-03	1.74E-03	1.87E-03	2.03E-03	2.32E-03	2.49E-03	2.32E-03	1.70E-03	1.34E-03	1.21E-03	9.90E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	1.13E-04	7.60E-05	5.74E-05	4.94E-05	6.87E-05	1.48E-04	3.83E-04	6.88E-04	6.43E-04	5.65E-04	5.30E-04	4.41E-04	4.05E-04	4.34E-04	4.68E-04	5.07E-04	5.81E-04	6.22E-04	5.80E-04	4.24E-04	3.36E-04	3.01E-04	2.48E-04
	Emission in each Box of 2nd jet	g/s	8.24E-05	6.43E-05	4.34E-05	3.28E-05	2.82E-05	3.93E-05	8.45E-05	2.19E-04	3.93E-04	3.68E-04	3.23E-04	3.03E-04	2.52E-04	2.31E-04	2.48E-04	2.67E-04	2.90E-04	3.32E-04	3.56E-04	3.32E-04	2.42E-04	1.92E-04	1.72E-04	1.41E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1886	0.1625	0.1611	0.1703	0.1758	0.2937	0.3082	0.2644	0.2743	0.2617	0.2544	0.2489	0.2496	0.2483	0.2442	0.2501	0.2648	0.2750	0.2834	0.2637	0.2401	0.2439	0.2361	0.2216
	NO2	g/vehicle/km	0.0373	0.0359	0.0354	0.0361	0.0369	0.0428	0.0433	0.0453	0.0537	0.0513	0.0497	0.0482	0.0429	0.0419	0.0416	0.0428	0.0455	0.0472	0.0494	0.0466	0.0414	0.0397	0.0382	0.0364
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0089***	***0.0062***	***0.0042***	***0.0033***	***0.0029***	***0.0058***	***0.0129***	***0.0275***	***0.0427***	***0.0395***	***0.0352***	***0.0330***	***0.0314***	***0.0292***	***0.0305***	***0.0328***	***0.0363***	***0.0406***	***0.0441***	***0.0394***	***0.0295***	***0.0247***	***0.0224***	***0.0184***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.90E-03	4.14E-03	2.82E-03	2.21E-03	1.91E-03	3.85E-03	8.58E-03	1.83E-02	2.85E-02	2.63E-02	2.35E-02	2.20E-02	2.09E-02	1.95E-02	2.03E-02	2.18E-02	2.42E-02	2.70E-02	2.94E-02	2.62E-02	1.97E-02	1.65E-02	1.49E-02	1.22E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.95E-03	2.07E-03	1.41E-03	1.10E-03	9.57E-04	1.92E-03	4.29E-03	9.16E-03	1.42E-02	1.32E-02	1.17E-02	1.10E-02	1.05E-02	9.75E-03	1.02E-02	1.09E-02	1.21E-02	1.35E-02	1.47E-02	1.31E-02	9.85E-03	8.25E-03	7.45E-03	6.12E-03
	Emission in each Box of 1st jet	g/s	7.38E-04	5.18E-04	3.52E-04	2.76E-04	2.39E-04	4.81E-04	1.07E-03	2.29E-03	3.56E-03	3.29E-03	2.93E-03	2.75E-03	2.61E-03	2.44E-03	2.54E-03	2.73E-03	3.02E-03	3.38E-03	3.68E-03	3.28E-03	2.46E-03	2.06E-03	1.86E-03	1.53E-03
	Emission in each Box of 2nd jet	g/s	4.22E-04	2.96E-04	2.01E-04	1.58E-04	1.37E-04	2.75E-04	6.13E-04	1.31E-03	2.03E-03	1.88E-03	1.68E-03	1.57E-03	1.49E-03	1.39E-03	1.45E-03	1.56E-03	1.73E-03	1.93E-03	2.10E-03	1.87E-03	1.41E-03	1.18E-03	1.06E-03	8.74E-04
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0008***	***0.0018***	***0.0047***	***0.0084***	***0.0077***	***0.0069***	***0.0064***	***0.0054***	***0.0049***	***0.0052***	***0.0056***	***0.0062***	***0.0070***	***0.0077***	***0.0070***	***0.0051***	***0.0040***	***0.0036***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.17E-03	9.17E-04	6.19E-04	4.68E-04	4.02E-04	5.61E-04	1.21E-03	3.14E-03	5.57E-03	5.17E-03	4.59E-03	4.25E-03	3.59E-03	3.29E-03	3.46E-03	3.73E-03	4.15E-03	4.64E-03	5.12E-03	4.64E-03	3.39E-03	2.69E-03	2.41E-03	2.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.84E-04	4.58E-04	3.10E-04	2.34E-04	2.01E-04	2.80E-04	6.03E-04	1.57E-03	2.79E-03	2.58E-03	2.29E-03	2.13E-03	1.80E-03	1.65E-03	1.73E-03	1.87E-03	2.08E-03	2.32E-03	2.56E-03	2.32E-03	1.70E-03	1.34E-03	1.21E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	1.46E-04	1.15E-04	7.74E-05	5.85E-05	5.03E-05	7.01E-05	1.51E-04	3.92E-04	6.96E-04	6.46E-04	5.73E-04	5.32E-04	4.49E-04	4.12E-04	4.33E-04	4.66E-04	5.19E-04	5.80E-04	6.40E-04	5.80E-04	4.24E-04	3.36E-04	3.02E-04	2.51E-04
	Emission in each Box of 2nd jet	g/s	8.34E-05	6.55E-05	4.42E-05	3.34E-05	2.87E-05	4.00E-05	8.61E-05	2.24E-04	3.98E-04	3.69E-04	3.28E-04	3.04E-04	2.57E-04	2.35E-04	2.47E-04	2.67E-04	2.97E-04	3.31E-04	3.66E-04	3.32E-04	2.42E-04	1.92E-04	1.72E-04	1.44E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1873	0.1612	0.1598	0.1679	0.1787	0.2985	0.3116	0.2611	0.2765	0.2644	0.2574	0.2486	0.2525	0.2547	0.2489	0.2565	0.2621	0.2739	0.2819	0.2605	0.2473	0.2496	0.2417	0.2269
	NO2	g/vehicle/km	0.0370	0.0357	0.0351	0.0356	0.0375	0.0435	0.0437	0.0447	0.0540	0.0518	0.0503	0.0480	0.0433	0.0429	0.0423	0.0438	0.0451	0.0470	0.0491	0.0461	0.0425	0.0406	0.0391	0.0372
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0088***	***0.0062***	***0.0042***	***0.0033***	***0.0029***	***0.0059***	***0.0130***	***0.0271***	***0.0431***	***0.0399***	***0.0356***	***0.0329***	***0.0317***	***0.0300***	***0.0310***	***0.0336***	***0.0359***	***0.0404***	***0.0439***	***0.0389***	***0.0304***	***0.0253***	***0.0229***	***0.0188***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.86E-03	4.11E-03	2.80E-03	2.18E-03	1.95E-03	3.91E-03	8.67E-03	1.81E-02	2.87E-02	2.66E-02	2.37E-02	2.19E-02	2.12E-02	2.00E-02	2.07E-02	2.24E-02	2.39E-02	2.69E-02	2.93E-02	2.59E-02	2.03E-02	1.69E-02	1.53E-02	1.25E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.93E-03	2.06E-03	1.40E-03	1.09E-03	9.73E-04	1.95E-03	4.34E-03	9.05E-03	1.44E-02	1.33E-02	1.19E-02	1.10E-02	1.06E-02	1.00E-02	1.03E-02	1.12E-02	1.20E-02	1.35E-02	1.46E-02	1.30E-02	1.01E-02	8.44E-03	7.63E-03	6.26E-03
	Emission in each Box of 1st jet	g/s	7.33E-04	5.14E-04	3.50E-04	2.72E-04	2.43E-04	4.89E-04	1.08E-03	2.26E-03	3.59E-03	3.33E-03	2.97E-03	2.74E-03	2.65E-03	2.50E-03	2.59E-03	2.80E-03	2.99E-03	3.37E-03	3.66E-03	3.24E-03	2.54E-03	2.11E-03	1.91E-03	1.57E-03
	Emission in each Box of 2nd jet	g/s	4.19E-04	2.94E-04	2.00E-04	1.56E-04	1.39E-04	2.79E-04	6.20E-04	1.29E-03	2.05E-03	1.90E-03	1.70E-03	1.57E-03	1.51E-03	1.43E-03	1.48E-03	1.60E-03	1.71E-03	1.92E-03	2.09E-03	1.85E-03	1.45E-03	1.21E-03	1.09E-03	8.95E-04
NO_2 Emission Rate		g/s	***0.0017***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0009***	***0.0018***	***0.0046***	***0.0084***	***0.0078***	***0.0070***	***0.0064***	***0.0054***	***0.0051***	***0.0053***	***0.0057***	***0.0062***	***0.0069***	***0.0076***	***0.0069***	***0.0052***	***0.0041***	***0.0037***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.16E-03	9.10E-04	6.15E-04	4.61E-04	4.08E-04	5.69E-04	1.22E-03	3.10E-03	5.61E-03	5.22E-03	4.64E-03	4.24E-03	3.63E-03	3.37E-03	3.52E-03	3.82E-03	4.12E-03	4.62E-03	5.10E-03	4.59E-03	3.49E-03	2.75E-03	2.47E-03	2.05E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.80E-04	4.55E-04	3.07E-04	2.31E-04	2.04E-04	2.85E-04	6.09E-04	1.55E-03	2.80E-03	2.61E-03	2.32E-03	2.12E-03	1.81E-03	1.69E-03	1.76E-03	1.91E-03	2.06E-03	2.31E-03	2.55E-03	2.29E-03	1.74E-03	1.37E-03	1.23E-03	1.03E-03
	Emission in each Box of 1st jet	g/s	1.45E-04	1.14E-04	7.68E-05	5.77E-05	5.11E-05	7.12E-05	1.52E-04	3.87E-04	7.01E-04	6.52E-04	5.80E-04	5.30E-04	4.53E-04	4.21E-04	4.40E-04	4.78E-04	5.14E-04	5.77E-04	6.37E-04	5.74E-04	4.36E-04	3.43E-04	3.08E-04	2.57E-04
	Emission in each Box of 2nd jet	g/s	8.28E-05	6.50E-05	4.39E-05	3.30E-05	2.92E-05	4.07E-05	8.70E-05	2.21E-04	4.01E-04	3.73E-04	3.31E-04	3.03E-04	2.59E-04	2.41E-04	2.52E-04	2.73E-04	2.94E-04	3.30E-04	3.64E-04	3.28E-04	2.49E-04	1.96E-04	1.76E-04	1.47E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2109	0.1829	0.1807	0.1914	0.1968	0.3297	0.3454	0.2992	0.3129	0.2992	0.2802	0.2769	0.2830	0.2797	0.2752	0.2823	0.2921	0.3046	0.3154	0.2958	0.2727	0.2769	0.2684	0.2509
	NO2	g/vehicle/km	0.0415	0.0402	0.0394	0.0402	0.0410	0.0478	0.0482	0.0509	0.0609	0.0584	0.0546	0.0533	0.0483	0.0470	0.0466	0.0479	0.0499	0.0520	0.0547	0.0521	0.0466	0.0448	0.0432	0.0409
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0099***	***0.0070***	***0.0047***	***0.0037***	***0.0032***	***0.0065***	***0.0144***	***0.0311***	***0.0487***	***0.0452***	***0.0388***	***0.0367***	***0.0356***	***0.0329***	***0.0343***	***0.0370***	***0.0400***	***0.0449***	***0.0491***	***0.0442***	***0.0336***	***0.0281***	***0.0254***	***0.0208***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.60E-03	4.67E-03	3.16E-03	2.48E-03	2.14E-03	4.32E-03	9.62E-03	2.07E-02	3.25E-02	3.01E-02	2.58E-02	2.44E-02	2.37E-02	2.20E-02	2.29E-02	2.46E-02	2.67E-02	2.99E-02	3.27E-02	2.94E-02	2.24E-02	1.87E-02	1.69E-02	1.39E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.30E-03	2.33E-03	1.58E-03	1.24E-03	1.07E-03	2.16E-03	4.81E-03	1.04E-02	1.62E-02	1.51E-02	1.29E-02	1.22E-02	1.19E-02	1.10E-02	1.14E-02	1.23E-02	1.33E-02	1.50E-02	1.64E-02	1.47E-02	1.12E-02	9.36E-03	8.47E-03	6.93E-03
	Emission in each Box of 1st jet	g/s	8.25E-04	5.83E-04	3.95E-04	3.10E-04	2.68E-04	5.40E-04	1.20E-03	2.59E-03	4.06E-03	3.77E-03	3.23E-03	3.06E-03	2.97E-03	2.74E-03	2.86E-03	3.08E-03	3.34E-03	3.74E-03	4.09E-03	3.68E-03	2.80E-03	2.34E-03	2.12E-03	1.73E-03
	Emission in each Box of 2nd jet	g/s	4.72E-04	3.33E-04	2.26E-04	1.77E-04	1.53E-04	3.08E-04	6.87E-04	1.48E-03	2.32E-03	2.15E-03	1.85E-03	1.75E-03	1.69E-03	1.57E-03	1.63E-03	1.76E-03	1.91E-03	2.14E-03	2.34E-03	2.10E-03	1.60E-03	1.34E-03	1.21E-03	9.89E-04
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0009***	***0.0020***	***0.0053***	***0.0095***	***0.0088***	***0.0075***	***0.0071***	***0.0061***	***0.0055***	***0.0058***	***0.0063***	***0.0068***	***0.0077***	***0.0085***	***0.0078***	***0.0057***	***0.0045***	***0.0041***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.30E-03	1.02E-03	6.89E-04	5.21E-04	4.47E-04	6.26E-04	1.34E-03	3.53E-03	6.32E-03	5.88E-03	5.03E-03	4.71E-03	4.05E-03	3.69E-03	3.88E-03	4.18E-03	4.56E-03	5.11E-03	5.67E-03	5.18E-03	3.83E-03	3.03E-03	2.72E-03	2.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.49E-04	5.12E-04	3.45E-04	2.61E-04	2.23E-04	3.13E-04	6.71E-04	1.76E-03	3.16E-03	2.94E-03	2.52E-03	2.35E-03	2.02E-03	1.84E-03	1.94E-03	2.09E-03	2.28E-03	2.56E-03	2.84E-03	2.59E-03	1.91E-03	1.51E-03	1.36E-03	1.13E-03
	Emission in each Box of 1st jet	g/s	1.62E-04	1.28E-04	8.62E-05	6.51E-05	5.58E-05	7.82E-05	1.68E-04	4.41E-04	7.90E-04	7.35E-04	6.29E-04	5.89E-04	5.06E-04	4.61E-04	4.85E-04	5.23E-04	5.70E-04	6.39E-04	7.09E-04	6.48E-04	4.78E-04	3.79E-04	3.41E-04	2.83E-04
	Emission in each Box of 2nd jet	g/s	9.27E-05	7.32E-05	4.92E-05	3.72E-05	3.19E-05	4.47E-05	9.59E-05	2.52E-04	4.52E-04	4.20E-04	3.59E-04	3.36E-04	2.89E-04	2.63E-04	2.77E-04	2.99E-04	3.26E-04	3.65E-04	4.05E-04	3.70E-04	2.73E-04	2.16E-04	1.95E-04	1.61E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2310	0.2028	0.2007	0.2147	0.2216	0.3712	0.3882	0.3355	0.3519	0.3375	0.3161	0.3105	0.3135	0.3098	0.3048	0.3129	0.3220	0.3416	0.3468	0.3301	0.3028	0.3074	0.2983	0.2799
	NO2	g/vehicle/km	0.0452	0.0442	0.0434	0.0447	0.0458	0.0535	0.0539	0.0568	0.0681	0.0655	0.0613	0.0596	0.0533	0.0518	0.0514	0.0529	0.0548	0.0580	0.0598	0.0577	0.0514	0.0494	0.0477	0.0454
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0108***	***0.0078***	***0.0053***	***0.0042***	***0.0036***	***0.0073***	***0.0162***	***0.0349***	***0.0548***	***0.0510***	***0.0437***	***0.0411***	***0.0394***	***0.0365***	***0.0380***	***0.0410***	***0.0441***	***0.0504***	***0.0540***	***0.0493***	***0.0373***	***0.0312***	***0.0283***	***0.0232***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.23E-03	5.17E-03	3.51E-03	2.78E-03	2.41E-03	4.86E-03	1.08E-02	2.32E-02	3.65E-02	3.40E-02	2.91E-02	2.74E-02	2.63E-02	2.43E-02	2.53E-02	2.73E-02	2.94E-02	3.36E-02	3.60E-02	3.29E-02	2.48E-02	2.08E-02	1.88E-02	1.55E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.62E-03	2.59E-03	1.76E-03	1.39E-03	1.21E-03	2.43E-03	5.40E-03	1.16E-02	1.83E-02	1.70E-02	1.46E-02	1.37E-02	1.31E-02	1.22E-02	1.27E-02	1.37E-02	1.47E-02	1.68E-02	1.80E-02	1.64E-02	1.24E-02	1.04E-02	9.42E-03	7.73E-03
	Emission in each Box of 1st jet	g/s	9.04E-04	6.47E-04	4.39E-04	3.48E-04	3.02E-04	6.07E-04	1.35E-03	2.91E-03	4.57E-03	4.25E-03	3.64E-03	3.43E-03	3.28E-03	3.04E-03	3.17E-03	3.41E-03	3.68E-03	4.20E-03	4.50E-03	4.11E-03	3.10E-03	2.60E-03	2.35E-03	1.93E-03
	Emission in each Box of 2nd jet	g/s	5.17E-04	3.70E-04	2.51E-04	1.99E-04	1.72E-04	3.47E-04	7.72E-04	1.66E-03	2.61E-03	2.43E-03	2.08E-03	1.96E-03	1.88E-03	1.74E-03	1.81E-03	1.95E-03	2.10E-03	2.40E-03	2.57E-03	2.35E-03	1.77E-03	1.49E-03	1.35E-03	1.10E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0017***	***0.0011***	***0.0009***	***0.0007***	***0.0011***	***0.0023***	***0.0059***	***0.0106***	***0.0099***	***0.0085***	***0.0079***	***0.0067***	***0.0061***	***0.0064***	***0.0069***	***0.0075***	***0.0086***	***0.0093***	***0.0086***	***0.0063***	***0.0050***	***0.0045***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.41E-03	1.13E-03	7.60E-04	5.80E-04	4.99E-04	7.00E-04	1.50E-03	3.93E-03	7.07E-03	6.59E-03	5.65E-03	5.26E-03	4.46E-03	4.06E-03	4.27E-03	4.61E-03	5.01E-03	5.71E-03	6.21E-03	5.75E-03	4.22E-03	3.34E-03	3.01E-03	2.50E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.07E-04	5.64E-04	3.80E-04	2.90E-04	2.49E-04	3.50E-04	7.51E-04	1.97E-03	3.53E-03	3.30E-03	2.83E-03	2.63E-03	2.23E-03	2.03E-03	2.14E-03	2.31E-03	2.50E-03	2.85E-03	3.10E-03	2.87E-03	2.11E-03	1.67E-03	1.50E-03	1.25E-03
	Emission in each Box of 1st jet	g/s	1.77E-04	1.41E-04	9.50E-05	7.25E-05	6.24E-05	8.75E-05	1.88E-04	4.92E-04	8.83E-04	8.24E-04	7.06E-04	6.57E-04	5.58E-04	5.08E-04	5.34E-04	5.77E-04	6.26E-04	7.13E-04	7.76E-04	7.18E-04	5.27E-04	4.18E-04	3.76E-04	3.13E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	8.05E-05	5.43E-05	4.14E-05	3.56E-05	5.00E-05	1.07E-04	2.81E-04	5.05E-04	4.71E-04	4.04E-04	3.76E-04	3.19E-04	2.90E-04	3.05E-04	3.30E-04	3.58E-04	4.08E-04	4.43E-04	4.10E-04	3.01E-04	2.39E-04	2.15E-04	1.79E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	739	602	413	306	257	309	657	1635	2450	2376	2176	2083	1978	1853	1963	2060	2156	2320	2449	2349	1936	1596	1490	1303
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2433	0.2121	0.2102	0.2234	0.2332	0.3885	0.4051	0.3497	0.3665	0.3510	0.3281	0.3229	0.3254	0.3215	0.3173	0.3251	0.3343	0.3537	0.3627	0.3410	0.3139	0.3179	0.3124	0.2932
	NO2	g/vehicle/km	0.0473	0.0459	0.0451	0.0462	0.0479	0.0557	0.0560	0.0589	0.0706	0.0679	0.0634	0.0617	0.0551	0.0536	0.0534	0.0548	0.0567	0.0599	0.0623	0.0594	0.0531	0.0509	0.0497	0.0473
	RSP	g/vehicle/km	0.0138	0.0116	0.0115	0.0124	0.0129	0.0233	0.0244	0.0194	0.0180	0.0175	0.0172	0.0171	0.0181	0.0181	0.0178	0.0182	0.0185	0.0189	0.0190	0.0181	0.0176	0.0184	0.0180	0.0170
	FSP	g/vehicle/km	0.0127	0.0107	0.0105	0.0114	0.0119	0.0214	0.0224	0.0178	0.0166	0.0161	0.0159	0.0157	0.0167	0.0167	0.0164	0.0167	0.0170	0.0174	0.0175	0.0166	0.0162	0.0169	0.0166	0.0157
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0114***	***0.0081***	***0.0055***	***0.0043***	***0.0038***	***0.0076***	***0.0169***	***0.0363***	***0.0571***	***0.0530***	***0.0454***	***0.0427***	***0.0409***	***0.0379***	***0.0396***	***0.0426***	***0.0458***	***0.0522***	***0.0564***	***0.0509***	***0.0386***	***0.0322***	***0.0296***	***0.0243***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.62E-03	5.41E-03	3.68E-03	2.90E-03	2.54E-03	5.09E-03	1.13E-02	2.42E-02	3.80E-02	3.53E-02	3.02E-02	2.85E-02	2.73E-02	2.52E-02	2.64E-02	2.84E-02	3.05E-02	3.48E-02	3.76E-02	3.39E-02	2.58E-02	2.15E-02	1.97E-02	1.62E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.81E-03	2.71E-03	1.84E-03	1.45E-03	1.27E-03	2.54E-03	5.64E-03	1.21E-02	1.90E-02	1.77E-02	1.51E-02	1.42E-02	1.36E-02	1.26E-02	1.32E-02	1.42E-02	1.53E-02	1.74E-02	1.88E-02	1.70E-02	1.29E-02	1.07E-02	9.86E-03	8.09E-03
	Emission in each Box of 1st jet	g/s	9.52E-04	6.76E-04	4.60E-04	3.62E-04	3.17E-04	6.36E-04	1.41E-03	3.03E-03	4.76E-03	4.42E-03	3.78E-03	3.56E-03	3.41E-03	3.16E-03	3.30E-03	3.55E-03	3.82E-03	4.35E-03	4.70E-03	4.24E-03	3.22E-03	2.69E-03	2.47E-03	2.02E-03
	Emission in each Box of 2nd jet	g/s	5.44E-04	3.87E-04	2.63E-04	2.07E-04	1.81E-04	3.63E-04	8.05E-04	1.73E-03	2.72E-03	2.52E-03	2.16E-03	2.04E-03	1.95E-03	1.80E-03	1.89E-03	2.03E-03	2.18E-03	2.48E-03	2.69E-03	2.42E-03	1.84E-03	1.54E-03	1.41E-03	1.16E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0023***	***0.0061***	***0.0110***	***0.0103***	***0.0088***	***0.0082***	***0.0069***	***0.0063***	***0.0067***	***0.0072***	***0.0078***	***0.0088***	***0.0097***	***0.0089***	***0.0065***	***0.0052***	***0.0047***	***0.0039***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.48E-03	1.17E-03	7.90E-04	5.99E-04	5.21E-04	7.30E-04	1.56E-03	4.08E-03	7.33E-03	6.84E-03	5.85E-03	5.45E-03	4.62E-03	4.21E-03	4.44E-03	4.78E-03	5.18E-03	5.89E-03	6.46E-03	5.91E-03	4.36E-03	3.45E-03	3.14E-03	2.61E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.41E-04	5.86E-04	3.95E-04	3.00E-04	2.61E-04	3.65E-04	7.80E-04	2.04E-03	3.67E-03	3.42E-03	2.92E-03	2.72E-03	2.31E-03	2.10E-03	2.22E-03	2.39E-03	2.59E-03	2.94E-03	3.23E-03	2.96E-03	2.18E-03	1.72E-03	1.57E-03	1.31E-03
	Emission in each Box of 1st jet	g/s	1.85E-04	1.46E-04	9.87E-05	7.49E-05	6.51E-05	9.12E-05	1.95E-04	5.10E-04	9.16E-04	8.54E-04	7.31E-04	6.81E-04	5.78E-04	5.26E-04	5.55E-04	5.98E-04	6.48E-04	7.36E-04	8.08E-04	7.39E-04	5.45E-04	4.31E-04	3.92E-04	3.26E-04
	Emission in each Box of 2nd jet	g/s	1.06E-04	8.37E-05	5.64E-05	4.28E-05	3.72E-05	5.21E-05	1.11E-04	2.92E-04	5.24E-04	4.88E-04	4.18E-04	3.89E-04	3.30E-04	3.01E-04	3.17E-04	3.42E-04	3.70E-04	4.21E-04	4.62E-04	4.22E-04	3.11E-04	2.46E-04	2.24E-04	1.87E-04
RSP Emission Rate		g/s	***6.49E-04***	***4.44E-04***	***3.01E-04***	***2.41E-04***	***2.11E-04***	***4.57E-04***	***1.02E-03***	***2.01E-03***	***2.81E-03***	***2.64E-03***	***2.38E-03***	***2.27E-03***	***2.28E-03***	***2.13E-03***	***2.22E-03***	***2.38E-03***	***2.53E-03***	***2.79E-03***	***2.96E-03***	***2.70E-03***	***2.17E-03***	***1.87E-03***	***1.71E-03***	***1.41E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.32E-04	2.96E-04	2.01E-04	1.61E-04	1.40E-04	3.05E-04	6.79E-04	1.34E-03	1.87E-03	1.76E-03	1.59E-03	1.51E-03	1.52E-03	1.42E-03	1.48E-03	1.59E-03	1.69E-03	1.86E-03	1.98E-03	1.80E-03	1.45E-03	1.24E-03	1.14E-03	9.39E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.16E-04	1.48E-04	1.00E-04	8.04E-05	7.02E-05	1.52E-04	3.40E-04	6.71E-04	9.36E-04	8.80E-04	7.95E-04	7.56E-04	7.61E-04	7.11E-04	7.39E-04	7.94E-04	8.45E-04	9.31E-04	9.88E-04	8.99E-04	7.23E-04	6.22E-04	5.70E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	5.40E-05	3.70E-05	2.51E-05	2.01E-05	1.75E-05	3.81E-05	8.49E-05	1.68E-04	2.34E-04	2.20E-04	1.99E-04	1.89E-04	1.90E-04	1.78E-04	1.85E-04	1.99E-04	2.11E-04	2.33E-04	2.47E-04	2.25E-04	1.81E-04	1.55E-04	1.42E-04	1.17E-04
	Emission in each Box of 2nd jet	g/s	3.09E-05	2.12E-05	1.43E-05	1.15E-05	1.00E-05	2.18E-05	4.85E-05	9.59E-05	1.34E-04	1.26E-04	1.14E-04	1.08E-04	1.09E-04	1.02E-04	1.06E-04	1.13E-04	1.21E-04	1.33E-04	1.41E-04	1.28E-04	1.03E-04	8.89E-05	8.14E-05	6.71E-05
FSP Emission Rate		g/s	***5.96E-04***	***4.09E-04***	***2.77E-04***	***2.22E-04***	***1.94E-04***	***4.20E-04***	***9.37E-04***	***1.85E-03***	***2.58E-03***	***2.43E-03***	***2.19E-03***	***2.08E-03***	***2.10E-03***	***1.97E-03***	***2.04E-03***	***2.19E-03***	***2.33E-03***	***2.57E-03***	***2.72E-03***	***2.48E-03***	***2.00E-03***	***1.72E-03***	***1.58E-03***	***1.30E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.98E-04	2.72E-04	1.85E-04	1.48E-04	1.29E-04	2.80E-04	6.25E-04	1.24E-03	1.72E-03	1.62E-03	1.46E-03	1.39E-03	1.40E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.71E-03	1.82E-03	1.65E-03	1.33E-03	1.15E-03	1.05E-03	8.65E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.99E-04	1.36E-04	9.23E-05	7.40E-05	6.45E-05	1.40E-04	3.12E-04	6.18E-04	8.61E-04	8.09E-04	7.31E-04	6.94E-04	6.99E-04	6.56E-04	6.81E-04	7.30E-04	7.77E-04	8.56E-04	9.08E-04	8.27E-04	6.66E-04	5.73E-04	5.25E-04	4.32E-04
	Emission in each Box of 1st jet	g/s	4.97E-05	3.41E-05	2.31E-05	1.85E-05	1.61E-05	3.50E-05	7.81E-05	1.55E-04	2.15E-04	2.02E-04	1.83E-04	1.74E-04	1.75E-04	1.64E-04	1.70E-04	1.82E-04	1.94E-04	2.14E-04	2.27E-04	2.07E-04	1.67E-04	1.43E-04	1.31E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	2.84E-05	1.95E-05	1.32E-05	1.06E-05	9.22E-06	2.00E-05	4.46E-05	8.83E-05	1.23E-04	1.16E-04	1.04E-04	9.92E-05	9.98E-05	9.37E-05	9.73E-05	1.04E-04	1.11E-04	1.22E-04	1.30E-04	1.18E-04	9.51E-05	8.18E-05	7.50E-05	6.18E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1342	0.1159	0.1176	0.1252	0.1271	0.2207	0.2336	0.1743	0.1688	0.1623	0.1563	0.1550	0.1975	0.1934	0.1931	0.1993	0.2043	0.2173	0.2231	0.2094	0.1922	0.1918	0.1935	0.1846
	NO2	g/vehicle/km	0.0234	0.0226	0.0231	0.0235	0.0236	0.0285	0.0293	0.0261	0.0301	0.0289	0.0273	0.0268	0.0325	0.0309	0.0316	0.0328	0.0341	0.0369	0.0384	0.0364	0.0314	0.0289	0.0290	0.0281
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0079***	***0.0055***	***0.0039***	***0.0030***	***0.0026***	***0.0052***	***0.0117***	***0.0223***	***0.0327***	***0.0305***	***0.0269***	***0.0255***	***0.0353***	***0.0323***	***0.0342***	***0.0371***	***0.0398***	***0.0456***	***0.0494***	***0.0445***	***0.0336***	***0.0275***	***0.0259***	***0.0218***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.24E-03	3.69E-03	2.58E-03	2.03E-03	1.71E-03	3.47E-03	7.80E-03	1.49E-02	2.18E-02	2.03E-02	1.79E-02	1.70E-02	2.35E-02	2.16E-02	2.28E-02	2.47E-02	2.65E-02	3.04E-02	3.29E-02	2.97E-02	2.24E-02	1.83E-02	1.73E-02	1.45E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.62E-03	1.85E-03	1.29E-03	1.02E-03	8.54E-04	1.73E-03	3.90E-03	7.43E-03	1.09E-02	1.02E-02	8.95E-03	8.49E-03	1.18E-02	1.08E-02	1.14E-02	1.24E-02	1.33E-02	1.52E-02	1.65E-02	1.48E-02	1.12E-02	9.17E-03	8.64E-03	7.26E-03
	Emission in each Box of 1st jet	g/s	1.05E-03	7.39E-04	5.16E-04	4.06E-04	3.42E-04	6.94E-04	1.56E-03	2.97E-03	4.35E-03	4.06E-03	3.58E-03	3.40E-03	4.70E-03	4.31E-03	4.56E-03	4.94E-03	5.30E-03	6.07E-03	6.59E-03	5.93E-03	4.48E-03	3.67E-03	3.46E-03	2.91E-03
	Emission in each Box of 2nd jet	g/s	8.73E-04	6.16E-04	4.30E-04	3.39E-04	2.85E-04	5.78E-04	1.30E-03	2.48E-03	3.63E-03	3.39E-03	2.98E-03	2.83E-03	3.92E-03	3.59E-03	3.80E-03	4.12E-03	4.42E-03	5.06E-03	5.49E-03	4.94E-03	3.73E-03	3.06E-03	2.88E-03	2.42E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0033***	***0.0058***	***0.0054***	***0.0047***	***0.0044***	***0.0058***	***0.0052***	***0.0056***	***0.0061***	***0.0066***	***0.0077***	***0.0085***	***0.0077***	***0.0055***	***0.0041***	***0.0039***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.14E-04	7.21E-04	5.07E-04	3.81E-04	3.18E-04	4.48E-04	9.79E-04	2.23E-03	3.89E-03	3.61E-03	3.13E-03	2.94E-03	3.87E-03	3.44E-03	3.73E-03	4.07E-03	4.43E-03	5.16E-03	5.66E-03	5.15E-03	3.65E-03	2.76E-03	2.59E-03	2.21E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.57E-04	3.60E-04	2.54E-04	1.90E-04	1.59E-04	2.24E-04	4.90E-04	1.11E-03	1.94E-03	1.81E-03	1.57E-03	1.47E-03	1.93E-03	1.72E-03	1.86E-03	2.03E-03	2.22E-03	2.58E-03	2.83E-03	2.58E-03	1.83E-03	1.38E-03	1.30E-03	1.11E-03
	Emission in each Box of 1st jet	g/s	1.83E-04	1.44E-04	1.01E-04	7.62E-05	6.35E-05	8.96E-05	1.96E-04	4.45E-04	7.77E-04	7.23E-04	6.26E-04	5.88E-04	7.73E-04	6.89E-04	7.46E-04	8.14E-04	8.86E-04	1.03E-03	1.13E-03	1.03E-03	7.30E-04	5.52E-04	5.18E-04	4.42E-04
	Emission in each Box of 2nd jet	g/s	1.52E-04	1.20E-04	8.45E-05	6.35E-05	5.30E-05	7.47E-05	1.63E-04	3.71E-04	6.48E-04	6.02E-04	5.22E-04	4.90E-04	6.44E-04	5.74E-04	6.22E-04	6.78E-04	7.38E-04	8.60E-04	9.44E-04	8.59E-04	6.09E-04	4.60E-04	4.32E-04	3.69E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1250	0.1067	0.1081	0.1166	0.1182	0.2060	0.2160	0.1626	0.1556	0.1478	0.1434	0.1424	0.1818	0.1794	0.1806	0.1847	0.1889	0.2021	0.2072	0.1959	0.1798	0.1798	0.1793	0.1710
	NO2	g/vehicle/km	0.0220	0.0211	0.0216	0.0221	0.0222	0.0268	0.0273	0.0246	0.0281	0.0266	0.0254	0.0249	0.0301	0.0289	0.0297	0.0306	0.0318	0.0346	0.0360	0.0343	0.0295	0.0273	0.0271	0.0262
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0073***	***0.0051***	***0.0036***	***0.0028***	***0.0024***	***0.0049***	***0.0108***	***0.0208***	***0.0301***	***0.0277***	***0.0246***	***0.0234***	***0.0324***	***0.0300***	***0.0320***	***0.0344***	***0.0368***	***0.0424***	***0.0459***	***0.0416***	***0.0314***	***0.0258***	***0.0240***	***0.0202***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.88E-03	3.40E-03	2.37E-03	1.89E-03	1.59E-03	3.24E-03	7.21E-03	1.39E-02	2.01E-02	1.85E-02	1.64E-02	1.56E-02	2.16E-02	2.00E-02	2.13E-02	2.29E-02	2.45E-02	2.83E-02	3.06E-02	2.78E-02	2.09E-02	1.72E-02	1.60E-02	1.35E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.44E-03	1.70E-03	1.19E-03	9.46E-04	7.95E-04	1.62E-03	3.61E-03	6.93E-03	1.00E-02	9.25E-03	8.21E-03	7.80E-03	1.08E-02	9.99E-03	1.07E-02	1.15E-02	1.23E-02	1.41E-02	1.53E-02	1.39E-02	1.05E-02	8.59E-03	8.01E-03	6.73E-03
	Emission in each Box of 1st jet	g/s	9.76E-04	6.80E-04	4.74E-04	3.78E-04	3.18E-04	6.48E-04	1.44E-03	2.77E-03	4.01E-03	3.70E-03	3.28E-03	3.12E-03	4.33E-03	4.00E-03	4.27E-03	4.58E-03	4.90E-03	5.65E-03	6.12E-03	5.55E-03	4.19E-03	3.44E-03	3.20E-03	2.69E-03
	Emission in each Box of 2nd jet	g/s	8.14E-04	5.67E-04	3.95E-04	3.15E-04	2.65E-04	5.40E-04	1.20E-03	2.31E-03	3.35E-03	3.08E-03	2.74E-03	2.60E-03	3.61E-03	3.33E-03	3.55E-03	3.82E-03	4.09E-03	4.71E-03	5.10E-03	4.63E-03	3.49E-03	2.86E-03	2.67E-03	2.24E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0014***	***0.0031***	***0.0054***	***0.0050***	***0.0044***	***0.0041***	***0.0054***	***0.0048***	***0.0053***	***0.0057***	***0.0062***	***0.0073***	***0.0080***	***0.0073***	***0.0052***	***0.0039***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.60E-04	6.74E-04	4.73E-04	3.59E-04	2.99E-04	4.21E-04	9.13E-04	2.09E-03	3.63E-03	3.33E-03	2.91E-03	2.73E-03	3.58E-03	3.22E-03	3.51E-03	3.80E-03	4.13E-03	4.84E-03	5.31E-03	4.86E-03	3.44E-03	2.61E-03	2.42E-03	2.06E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.30E-04	3.37E-04	2.37E-04	1.79E-04	1.49E-04	2.11E-04	4.56E-04	1.05E-03	1.81E-03	1.66E-03	1.45E-03	1.36E-03	1.79E-03	1.61E-03	1.75E-03	1.90E-03	2.07E-03	2.42E-03	2.65E-03	2.43E-03	1.72E-03	1.30E-03	1.21E-03	1.03E-03
	Emission in each Box of 1st jet	g/s	1.72E-04	1.35E-04	9.46E-05	7.18E-05	5.98E-05	8.42E-05	1.83E-04	4.19E-04	7.25E-04	6.66E-04	5.81E-04	5.45E-04	7.17E-04	6.43E-04	7.01E-04	7.60E-04	8.27E-04	9.68E-04	1.06E-03	9.72E-04	6.88E-04	5.21E-04	4.84E-04	4.13E-04
	Emission in each Box of 2nd jet	g/s	1.43E-04	1.12E-04	7.89E-05	5.98E-05	4.98E-05	7.02E-05	1.52E-04	3.49E-04	6.04E-04	5.55E-04	4.84E-04	4.54E-04	5.97E-04	5.36E-04	5.84E-04	6.33E-04	6.89E-04	8.07E-04	8.85E-04	8.10E-04	5.73E-04	4.34E-04	4.03E-04	3.44E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1177	0.1005	0.1020	0.1084	0.1099	0.1926	0.2025	0.1525	0.1464	0.1404	0.1346	0.1356	0.1732	0.1683	0.1694	0.1754	0.1776	0.1910	0.1972	0.1848	0.1688	0.1688	0.1683	0.1609
	NO2	g/vehicle/km	0.0209	0.0201	0.0205	0.0208	0.0209	0.0252	0.0258	0.0232	0.0266	0.0254	0.0240	0.0238	0.0288	0.0272	0.0280	0.0292	0.0300	0.0328	0.0344	0.0325	0.0279	0.0257	0.0256	0.0248
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0069***	***0.0048***	***0.0034***	***0.0026***	***0.0022***	***0.0045***	***0.0101***	***0.0195***	***0.0283***	***0.0264***	***0.0231***	***0.0223***	***0.0309***	***0.0281***	***0.0300***	***0.0326***	***0.0346***	***0.0400***	***0.0437***	***0.0393***	***0.0295***	***0.0242***	***0.0226***	***0.0190***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.59E-03	3.20E-03	2.24E-03	1.76E-03	1.48E-03	3.03E-03	6.76E-03	1.30E-02	1.89E-02	1.76E-02	1.54E-02	1.49E-02	2.06E-02	1.88E-02	2.00E-02	2.17E-02	2.30E-02	2.67E-02	2.91E-02	2.62E-02	1.97E-02	1.61E-02	1.50E-02	1.27E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.30E-03	1.60E-03	1.12E-03	8.79E-04	7.39E-04	1.51E-03	3.38E-03	6.50E-03	9.44E-03	8.79E-03	7.71E-03	7.43E-03	1.03E-02	9.38E-03	1.00E-02	1.09E-02	1.15E-02	1.33E-02	1.46E-02	1.31E-02	9.83E-03	8.07E-03	7.52E-03	6.33E-03
	Emission in each Box of 1st jet	g/s	9.19E-04	6.41E-04	4.47E-04	3.52E-04	2.96E-04	6.05E-04	1.35E-03	2.60E-03	3.78E-03	3.51E-03	3.08E-03	2.97E-03	4.12E-03	3.75E-03	4.00E-03	4.35E-03	4.61E-03	5.34E-03	5.82E-03	5.24E-03	3.93E-03	3.23E-03	3.01E-03	2.53E-03
	Emission in each Box of 2nd jet	g/s	7.66E-04	5.34E-04	3.73E-04	2.93E-04	2.46E-04	5.04E-04	1.13E-03	2.17E-03	3.15E-03	2.93E-03	2.57E-03	2.48E-03	3.44E-03	3.13E-03	3.34E-03	3.62E-03	3.84E-03	4.45E-03	4.85E-03	4.36E-03	3.28E-03	2.69E-03	2.51E-03	2.11E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0030***	***0.0051***	***0.0048***	***0.0041***	***0.0039***	***0.0051***	***0.0046***	***0.0050***	***0.0054***	***0.0058***	***0.0069***	***0.0076***	***0.0069***	***0.0049***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.15E-04	6.40E-04	4.50E-04	3.38E-04	2.81E-04	3.96E-04	8.61E-04	1.98E-03	3.43E-03	3.18E-03	2.75E-03	2.61E-03	3.43E-03	3.03E-03	3.31E-03	3.62E-03	3.90E-03	4.59E-03	5.08E-03	4.61E-03	3.25E-03	2.46E-03	2.28E-03	1.95E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.07E-04	3.20E-04	2.25E-04	1.69E-04	1.41E-04	1.98E-04	4.30E-04	9.89E-04	1.72E-03	1.59E-03	1.37E-03	1.30E-03	1.72E-03	1.52E-03	1.65E-03	1.81E-03	1.95E-03	2.29E-03	2.54E-03	2.30E-03	1.63E-03	1.23E-03	1.14E-03	9.76E-04
	Emission in each Box of 1st jet	g/s	1.63E-04	1.28E-04	9.01E-05	6.75E-05	5.62E-05	7.93E-05	1.72E-04	3.96E-04	6.86E-04	6.36E-04	5.49E-04	5.22E-04	6.86E-04	6.07E-04	6.62E-04	7.25E-04	7.80E-04	9.18E-04	1.02E-03	9.21E-04	6.51E-04	4.92E-04	4.57E-04	3.90E-04
	Emission in each Box of 2nd jet	g/s	1.36E-04	1.07E-04	7.51E-05	5.63E-05	4.68E-05	6.61E-05	1.43E-04	3.30E-04	5.72E-04	5.30E-04	4.58E-04	4.35E-04	5.72E-04	5.06E-04	5.52E-04	6.04E-04	6.50E-04	7.65E-04	8.46E-04	7.68E-04	5.42E-04	4.10E-04	3.81E-04	3.25E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1103	0.0941	0.0950	0.1035	0.1050	0.1851	0.1947	0.1451	0.1391	0.1336	0.1281	0.1287	0.1645	0.1627	0.1637	0.1664	0.1720	0.1816	0.1875	0.1748	0.1600	0.1627	0.1615	0.1538
	NO2	g/vehicle/km	0.0197	0.0190	0.0193	0.0200	0.0201	0.0243	0.0249	0.0222	0.0254	0.0243	0.0228	0.0226	0.0275	0.0263	0.0271	0.0278	0.0292	0.0313	0.0328	0.0309	0.0266	0.0249	0.0246	0.0238
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0065***	***0.0045***	***0.0031***	***0.0025***	***0.0021***	***0.0044***	***0.0098***	***0.0185***	***0.0269***	***0.0251***	***0.0220***	***0.0212***	***0.0294***	***0.0272***	***0.0290***	***0.0309***	***0.0335***	***0.0381***	***0.0415***	***0.0371***	***0.0279***	***0.0233***	***0.0216***	***0.0182***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.31E-03	3.00E-03	2.08E-03	1.68E-03	1.41E-03	2.91E-03	6.50E-03	1.24E-02	1.79E-02	1.67E-02	1.47E-02	1.41E-02	1.96E-02	1.81E-02	1.93E-02	2.06E-02	2.23E-02	2.54E-02	2.77E-02	2.48E-02	1.86E-02	1.56E-02	1.44E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.15E-03	1.50E-03	1.04E-03	8.40E-04	7.06E-04	1.45E-03	3.25E-03	6.18E-03	8.97E-03	8.36E-03	7.34E-03	7.05E-03	9.79E-03	9.06E-03	9.67E-03	1.03E-02	1.12E-02	1.27E-02	1.38E-02	1.24E-02	9.32E-03	7.78E-03	7.21E-03	6.05E-03
	Emission in each Box of 1st jet	g/s	8.61E-04	6.00E-04	4.17E-04	3.36E-04	2.82E-04	5.82E-04	1.30E-03	2.47E-03	3.59E-03	3.34E-03	2.93E-03	2.82E-03	3.92E-03	3.62E-03	3.87E-03	4.13E-03	4.47E-03	5.08E-03	5.54E-03	4.95E-03	3.73E-03	3.11E-03	2.89E-03	2.42E-03
	Emission in each Box of 2nd jet	g/s	7.18E-04	5.00E-04	3.47E-04	2.80E-04	2.35E-04	4.85E-04	1.08E-03	2.06E-03	2.99E-03	2.79E-03	2.45E-03	2.35E-03	3.26E-03	3.02E-03	3.22E-03	3.44E-03	3.72E-03	4.23E-03	4.61E-03	4.13E-03	3.11E-03	2.59E-03	2.40E-03	2.02E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0028***	***0.0049***	***0.0046***	***0.0039***	***0.0037***	***0.0049***	***0.0044***	***0.0048***	***0.0052***	***0.0057***	***0.0066***	***0.0073***	***0.0066***	***0.0046***	***0.0036***	***0.0033***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.70E-04	6.05E-04	4.24E-04	3.25E-04	2.70E-04	3.82E-04	8.30E-04	1.89E-03	3.28E-03	3.04E-03	2.62E-03	2.48E-03	3.27E-03	2.93E-03	3.20E-03	3.45E-03	3.79E-03	4.38E-03	4.84E-03	4.38E-03	3.10E-03	2.38E-03	2.20E-03	1.87E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.85E-04	3.02E-04	2.12E-04	1.62E-04	1.35E-04	1.91E-04	4.15E-04	9.46E-04	1.64E-03	1.52E-03	1.31E-03	1.24E-03	1.64E-03	1.47E-03	1.60E-03	1.73E-03	1.89E-03	2.19E-03	2.42E-03	2.19E-03	1.55E-03	1.19E-03	1.10E-03	9.37E-04
	Emission in each Box of 1st jet	g/s	1.54E-04	1.21E-04	8.48E-05	6.50E-05	5.41E-05	7.65E-05	1.66E-04	3.78E-04	6.56E-04	6.08E-04	5.23E-04	4.96E-04	6.54E-04	5.86E-04	6.41E-04	6.90E-04	7.57E-04	8.76E-04	9.68E-04	8.76E-04	6.19E-04	4.76E-04	4.40E-04	3.75E-04
	Emission in each Box of 2nd jet	g/s	1.28E-04	1.01E-04	7.07E-05	5.41E-05	4.51E-05	6.37E-05	1.38E-04	3.15E-04	5.47E-04	5.07E-04	4.36E-04	4.14E-04	5.45E-04	4.89E-04	5.34E-04	5.75E-04	6.31E-04	7.30E-04	8.07E-04	7.30E-04	5.16E-04	3.97E-04	3.67E-04	3.12E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0989	0.0837	0.0849	0.0899	0.0913	0.1612	0.1675	0.1257	0.1222	0.1167	0.1138	0.1141	0.1471	0.1447	0.1466	0.1484	0.1530	0.1639	0.1650	0.1566	0.1430	0.1414	0.1415	0.1346
	NO2	g/vehicle/km	0.0178	0.0171	0.0175	0.0177	0.0177	0.0214	0.0216	0.0194	0.0225	0.0214	0.0205	0.0203	0.0247	0.0236	0.0244	0.0250	0.0261	0.0284	0.0291	0.0279	0.0240	0.0218	0.0218	0.0210
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0058***	***0.0040***	***0.0028***	***0.0022***	***0.0018***	***0.0038***	***0.0084***	***0.0161***	***0.0236***	***0.0219***	***0.0196***	***0.0187***	***0.0263***	***0.0242***	***0.0260***	***0.0276***	***0.0298***	***0.0344***	***0.0365***	***0.0333***	***0.0250***	***0.0203***	***0.0190***	***0.0159***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.86E-03	2.67E-03	1.86E-03	1.46E-03	1.23E-03	2.53E-03	5.59E-03	1.07E-02	1.58E-02	1.46E-02	1.30E-02	1.25E-02	1.75E-02	1.61E-02	1.73E-02	1.84E-02	1.99E-02	2.29E-02	2.44E-02	2.22E-02	1.67E-02	1.35E-02	1.26E-02	1.06E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.93E-03	1.33E-03	9.31E-04	7.30E-04	6.14E-04	1.27E-03	2.80E-03	5.36E-03	7.88E-03	7.30E-03	6.52E-03	6.25E-03	8.75E-03	8.06E-03	8.66E-03	9.20E-03	9.93E-03	1.15E-02	1.22E-02	1.11E-02	8.33E-03	6.76E-03	6.32E-03	5.29E-03
	Emission in each Box of 1st jet	g/s	7.72E-04	5.33E-04	3.72E-04	2.92E-04	2.45E-04	5.07E-04	1.12E-03	2.14E-03	3.15E-03	2.92E-03	2.61E-03	2.50E-03	3.50E-03	3.22E-03	3.46E-03	3.68E-03	3.97E-03	4.58E-03	4.87E-03	4.44E-03	3.33E-03	2.70E-03	2.53E-03	2.12E-03
	Emission in each Box of 2nd jet	g/s	6.43E-04	4.45E-04	3.10E-04	2.43E-04	2.05E-04	4.22E-04	9.32E-04	1.79E-03	2.63E-03	2.43E-03	2.17E-03	2.08E-03	2.92E-03	2.69E-03	2.89E-03	3.07E-03	3.31E-03	3.82E-03	4.06E-03	3.70E-03	2.78E-03	2.25E-03	2.11E-03	1.76E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0025***	***0.0044***	***0.0040***	***0.0035***	***0.0033***	***0.0044***	***0.0039***	***0.0043***	***0.0046***	***0.0051***	***0.0060***	***0.0064***	***0.0059***	***0.0042***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.96E-04	5.44E-04	3.83E-04	2.86E-04	2.38E-04	3.36E-04	7.22E-04	1.65E-03	2.90E-03	2.68E-03	2.35E-03	2.22E-03	2.94E-03	2.63E-03	2.89E-03	3.10E-03	3.39E-03	3.98E-03	4.29E-03	3.95E-03	2.79E-03	2.09E-03	1.94E-03	1.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.48E-04	2.72E-04	1.91E-04	1.43E-04	1.19E-04	1.68E-04	3.61E-04	8.27E-04	1.45E-03	1.34E-03	1.17E-03	1.11E-03	1.47E-03	1.32E-03	1.44E-03	1.55E-03	1.69E-03	1.99E-03	2.15E-03	1.98E-03	1.40E-03	1.04E-03	9.72E-04	8.26E-04
	Emission in each Box of 1st jet	g/s	1.39E-04	1.09E-04	7.66E-05	5.73E-05	4.77E-05	6.73E-05	1.44E-04	3.31E-04	5.81E-04	5.35E-04	4.69E-04	4.44E-04	5.88E-04	5.26E-04	5.77E-04	6.19E-04	6.78E-04	7.95E-04	8.58E-04	7.90E-04	5.59E-04	4.18E-04	3.89E-04	3.31E-04
	Emission in each Box of 2nd jet	g/s	1.16E-04	9.07E-05	6.38E-05	4.77E-05	3.97E-05	5.61E-05	1.20E-04	2.76E-04	4.84E-04	4.46E-04	3.91E-04	3.70E-04	4.90E-04	4.38E-04	4.81E-04	5.16E-04	5.65E-04	6.63E-04	7.15E-04	6.59E-04	4.66E-04	3.48E-04	3.24E-04	2.75E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0953	0.0811	0.0844	0.0894	0.0903	0.1594	0.1635	0.1241	0.1193	0.1163	0.1100	0.1104	0.1413	0.1400	0.1400	0.1436	0.1504	0.1599	0.1619	0.1548	0.1414	0.1406	0.1399	0.1337
	NO2	g/vehicle/km	0.0173	0.0166	0.0174	0.0176	0.0175	0.0212	0.0211	0.0192	0.0221	0.0214	0.0198	0.0196	0.0238	0.0229	0.0234	0.0243	0.0257	0.0278	0.0286	0.0276	0.0237	0.0217	0.0215	0.0209
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0056***	***0.0039***	***0.0028***	***0.0022***	***0.0018***	***0.0038***	***0.0082***	***0.0159***	***0.0231***	***0.0218***	***0.0189***	***0.0181***	***0.0252***	***0.0234***	***0.0248***	***0.0267***	***0.0293***	***0.0335***	***0.0359***	***0.0329***	***0.0247***	***0.0202***	***0.0187***	***0.0158***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.72E-03	2.58E-03	1.85E-03	1.45E-03	1.21E-03	2.51E-03	5.46E-03	1.06E-02	1.54E-02	1.46E-02	1.26E-02	1.21E-02	1.68E-02	1.56E-02	1.65E-02	1.78E-02	1.95E-02	2.23E-02	2.39E-02	2.19E-02	1.65E-02	1.34E-02	1.25E-02	1.05E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.86E-03	1.29E-03	9.25E-04	7.25E-04	6.07E-04	1.25E-03	2.73E-03	5.29E-03	7.70E-03	7.28E-03	6.30E-03	6.05E-03	8.41E-03	7.80E-03	8.27E-03	8.90E-03	9.76E-03	1.12E-02	1.20E-02	1.10E-02	8.23E-03	6.72E-03	6.25E-03	5.26E-03
	Emission in each Box of 1st jet	g/s	7.44E-04	5.17E-04	3.70E-04	2.90E-04	2.43E-04	5.01E-04	1.09E-03	2.11E-03	3.08E-03	2.91E-03	2.52E-03	2.42E-03	3.36E-03	3.12E-03	3.31E-03	3.56E-03	3.90E-03	4.47E-03	4.78E-03	4.39E-03	3.29E-03	2.69E-03	2.50E-03	2.10E-03
	Emission in each Box of 2nd jet	g/s	6.20E-04	4.31E-04	3.08E-04	2.42E-04	2.02E-04	4.18E-04	9.10E-04	1.76E-03	2.57E-03	2.43E-03	2.10E-03	2.02E-03	2.80E-03	2.60E-03	2.76E-03	2.97E-03	3.25E-03	3.72E-03	3.98E-03	3.66E-03	2.74E-03	2.24E-03	2.08E-03	1.75E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0025***	***0.0043***	***0.0040***	***0.0034***	***0.0032***	***0.0042***	***0.0038***	***0.0041***	***0.0045***	***0.0050***	***0.0058***	***0.0063***	***0.0059***	***0.0041***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.74E-04	5.29E-04	3.81E-04	2.85E-04	2.36E-04	3.33E-04	7.06E-04	1.64E-03	2.85E-03	2.68E-03	2.27E-03	2.15E-03	2.83E-03	2.55E-03	2.76E-03	3.01E-03	3.34E-03	3.89E-03	4.22E-03	3.91E-03	2.76E-03	2.08E-03	1.92E-03	1.64E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.37E-04	2.65E-04	1.90E-04	1.42E-04	1.18E-04	1.66E-04	3.53E-04	8.18E-04	1.42E-03	1.34E-03	1.14E-03	1.07E-03	1.42E-03	1.27E-03	1.38E-03	1.50E-03	1.67E-03	1.94E-03	2.11E-03	1.96E-03	1.38E-03	1.04E-03	9.62E-04	8.22E-04
	Emission in each Box of 1st jet	g/s	1.35E-04	1.06E-04	7.62E-05	5.70E-05	4.72E-05	6.66E-05	1.41E-04	3.27E-04	5.70E-04	5.35E-04	4.55E-04	4.30E-04	5.67E-04	5.10E-04	5.52E-04	6.01E-04	6.68E-04	7.77E-04	8.44E-04	7.82E-04	5.52E-04	4.15E-04	3.85E-04	3.29E-04
	Emission in each Box of 2nd jet	g/s	1.12E-04	8.82E-05	6.35E-05	4.75E-05	3.93E-05	5.55E-05	1.18E-04	2.73E-04	4.75E-04	4.46E-04	3.79E-04	3.58E-04	4.72E-04	4.25E-04	4.60E-04	5.01E-04	5.57E-04	6.48E-04	7.03E-04	6.52E-04	4.60E-04	3.46E-04	3.21E-04	2.74E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0959	0.0806	0.0817	0.0865	0.0878	0.1544	0.1635	0.1209	0.1165	0.1124	0.1105	0.1117	0.1387	0.1375	0.1416	0.1443	0.1477	0.1593	0.1601	0.1530	0.1388	0.1389	0.1381	0.1303
	NO2	g/vehicle/km	0.0174	0.0165	0.0169	0.0171	0.0171	0.0206	0.0211	0.0188	0.0215	0.0207	0.0199	0.0198	0.0234	0.0225	0.0237	0.0243	0.0253	0.0277	0.0283	0.0273	0.0233	0.0215	0.0213	0.0204
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0056***	***0.0039***	***0.0027***	***0.0021***	***0.0018***	***0.0036***	***0.0082***	***0.0155***	***0.0225***	***0.0211***	***0.0190***	***0.0184***	***0.0248***	***0.0230***	***0.0251***	***0.0268***	***0.0287***	***0.0334***	***0.0355***	***0.0325***	***0.0243***	***0.0199***	***0.0185***	***0.0154***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.74E-03	2.57E-03	1.79E-03	1.40E-03	1.18E-03	2.43E-03	5.46E-03	1.03E-02	1.50E-02	1.41E-02	1.27E-02	1.22E-02	1.65E-02	1.53E-02	1.67E-02	1.79E-02	1.92E-02	2.23E-02	2.36E-02	2.17E-02	1.62E-02	1.33E-02	1.23E-02	1.03E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.87E-03	1.28E-03	8.96E-04	7.02E-04	5.90E-04	1.21E-03	2.73E-03	5.15E-03	7.51E-03	7.04E-03	6.33E-03	6.12E-03	8.25E-03	7.66E-03	8.36E-03	8.95E-03	9.58E-03	1.11E-02	1.18E-02	1.08E-02	8.08E-03	6.64E-03	6.17E-03	5.13E-03
	Emission in each Box of 1st jet	g/s	7.49E-04	5.14E-04	3.58E-04	2.81E-04	2.36E-04	4.85E-04	1.09E-03	2.06E-03	3.00E-03	2.82E-03	2.53E-03	2.45E-03	3.30E-03	3.06E-03	3.35E-03	3.58E-03	3.83E-03	4.45E-03	4.73E-03	4.34E-03	3.23E-03	2.66E-03	2.47E-03	2.05E-03
	Emission in each Box of 2nd jet	g/s	6.24E-04	4.28E-04	2.99E-04	2.34E-04	1.97E-04	4.04E-04	9.10E-04	1.72E-03	2.50E-03	2.35E-03	2.11E-03	2.04E-03	2.75E-03	2.55E-03	2.79E-03	2.98E-03	3.19E-03	3.71E-03	3.94E-03	3.61E-03	2.69E-03	2.21E-03	2.06E-03	1.71E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0024***	***0.0042***	***0.0039***	***0.0034***	***0.0033***	***0.0042***	***0.0038***	***0.0042***	***0.0045***	***0.0049***	***0.0058***	***0.0063***	***0.0058***	***0.0041***	***0.0031***	***0.0029***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.77E-04	5.26E-04	3.70E-04	2.77E-04	2.30E-04	3.23E-04	7.06E-04	1.60E-03	2.78E-03	2.59E-03	2.28E-03	2.17E-03	2.78E-03	2.51E-03	2.80E-03	3.02E-03	3.28E-03	3.87E-03	4.18E-03	3.87E-03	2.71E-03	2.05E-03	1.90E-03	1.61E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.39E-04	2.63E-04	1.85E-04	1.38E-04	1.15E-04	1.62E-04	3.53E-04	7.99E-04	1.39E-03	1.29E-03	1.14E-03	1.09E-03	1.39E-03	1.25E-03	1.40E-03	1.51E-03	1.64E-03	1.94E-03	2.09E-03	1.93E-03	1.36E-03	1.03E-03	9.50E-04	8.03E-04
	Emission in each Box of 1st jet	g/s	1.35E-04	1.05E-04	7.41E-05	5.54E-05	4.61E-05	6.47E-05	1.41E-04	3.20E-04	5.55E-04	5.17E-04	4.56E-04	4.34E-04	5.56E-04	5.01E-04	5.59E-04	6.03E-04	6.56E-04	7.75E-04	8.35E-04	7.74E-04	5.42E-04	4.11E-04	3.80E-04	3.21E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	8.77E-05	6.17E-05	4.61E-05	3.84E-05	5.39E-05	1.18E-04	2.66E-04	4.63E-04	4.31E-04	3.80E-04	3.62E-04	4.63E-04	4.18E-04	4.66E-04	5.03E-04	5.47E-04	6.46E-04	6.96E-04	6.45E-04	4.52E-04	3.42E-04	3.17E-04	2.68E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0972	0.0822	0.0834	0.0884	0.0897	0.1576	0.1669	0.1241	0.1179	0.1128	0.1124	0.1118	0.1413	0.1400	0.1409	0.1436	0.1514	0.1589	0.1648	0.1530	0.1389	0.1389	0.1382	0.1321
	NO2	g/vehicle/km	0.0176	0.0168	0.0172	0.0174	0.0175	0.0210	0.0215	0.0192	0.0218	0.0207	0.0202	0.0199	0.0238	0.0229	0.0235	0.0243	0.0259	0.0277	0.0291	0.0273	0.0233	0.0215	0.0213	0.0207
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0057***	***0.0039***	***0.0027***	***0.0022***	***0.0018***	***0.0037***	***0.0084***	***0.0159***	***0.0228***	***0.0212***	***0.0193***	***0.0184***	***0.0252***	***0.0234***	***0.0250***	***0.0267***	***0.0295***	***0.0333***	***0.0365***	***0.0325***	***0.0243***	***0.0199***	***0.0185***	***0.0156***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.80E-03	2.62E-03	1.83E-03	1.43E-03	1.21E-03	2.48E-03	5.57E-03	1.06E-02	1.52E-02	1.41E-02	1.29E-02	1.23E-02	1.68E-02	1.56E-02	1.66E-02	1.78E-02	1.96E-02	2.22E-02	2.43E-02	2.17E-02	1.62E-02	1.33E-02	1.23E-02	1.04E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.90E-03	1.31E-03	9.14E-04	7.17E-04	6.03E-04	1.24E-03	2.79E-03	5.29E-03	7.60E-03	7.06E-03	6.44E-03	6.13E-03	8.41E-03	7.80E-03	8.32E-03	8.90E-03	9.82E-03	1.11E-02	1.22E-02	1.08E-02	8.09E-03	6.64E-03	6.17E-03	5.20E-03
	Emission in each Box of 1st jet	g/s	7.59E-04	5.24E-04	3.66E-04	2.87E-04	2.41E-04	4.95E-04	1.11E-03	2.11E-03	3.04E-03	2.83E-03	2.57E-03	2.45E-03	3.36E-03	3.12E-03	3.33E-03	3.56E-03	3.93E-03	4.44E-03	4.87E-03	4.33E-03	3.24E-03	2.66E-03	2.47E-03	2.08E-03
	Emission in each Box of 2nd jet	g/s	6.33E-04	4.37E-04	3.05E-04	2.39E-04	2.01E-04	4.13E-04	9.29E-04	1.76E-03	2.53E-03	2.35E-03	2.15E-03	2.04E-03	2.80E-03	2.60E-03	2.77E-03	2.97E-03	3.27E-03	3.70E-03	4.06E-03	3.61E-03	2.70E-03	2.21E-03	2.06E-03	1.73E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0025***	***0.0042***	***0.0039***	***0.0035***	***0.0033***	***0.0042***	***0.0038***	***0.0042***	***0.0045***	***0.0050***	***0.0058***	***0.0064***	***0.0058***	***0.0041***	***0.0031***	***0.0029***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.86E-04	5.36E-04	3.77E-04	2.82E-04	2.35E-04	3.29E-04	7.19E-04	1.64E-03	2.82E-03	2.59E-03	2.32E-03	2.18E-03	2.83E-03	2.55E-03	2.78E-03	3.01E-03	3.36E-03	3.87E-03	4.29E-03	3.87E-03	2.71E-03	2.06E-03	1.90E-03	1.63E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.43E-04	2.68E-04	1.89E-04	1.41E-04	1.17E-04	1.65E-04	3.60E-04	8.18E-04	1.41E-03	1.30E-03	1.16E-03	1.09E-03	1.42E-03	1.27E-03	1.39E-03	1.50E-03	1.68E-03	1.93E-03	2.14E-03	1.93E-03	1.36E-03	1.03E-03	9.51E-04	8.13E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	1.07E-04	7.54E-05	5.64E-05	4.70E-05	6.59E-05	1.44E-04	3.27E-04	5.63E-04	5.19E-04	4.63E-04	4.35E-04	5.67E-04	5.10E-04	5.55E-04	6.01E-04	6.71E-04	7.73E-04	8.58E-04	7.74E-04	5.43E-04	4.11E-04	3.80E-04	3.25E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	8.93E-05	6.28E-05	4.70E-05	3.91E-05	5.49E-05	1.20E-04	2.73E-04	4.69E-04	4.32E-04	3.86E-04	3.63E-04	4.72E-04	4.25E-04	4.63E-04	5.01E-04	5.60E-04	6.44E-04	7.15E-04	6.45E-04	4.52E-04	3.43E-04	3.17E-04	2.71E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0965	0.0816	0.0827	0.0871	0.0913	0.1603	0.1687	0.1225	0.1189	0.1141	0.1138	0.1117	0.1430	0.1436	0.1436	0.1474	0.1498	0.1583	0.1640	0.1511	0.1430	0.1422	0.1415	0.1353
	NO2	g/vehicle/km	0.0175	0.0167	0.0171	0.0172	0.0177	0.0213	0.0218	0.0190	0.0220	0.0210	0.0205	0.0199	0.0241	0.0235	0.0240	0.0248	0.0256	0.0275	0.0289	0.0270	0.0240	0.0220	0.0218	0.0211
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0057***	***0.0039***	***0.0027***	***0.0021***	***0.0018***	***0.0038***	***0.0085***	***0.0157***	***0.0230***	***0.0214***	***0.0196***	***0.0184***	***0.0255***	***0.0240***	***0.0254***	***0.0274***	***0.0292***	***0.0332***	***0.0363***	***0.0321***	***0.0250***	***0.0204***	***0.0190***	***0.0160***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.77E-03	2.60E-03	1.81E-03	1.41E-03	1.23E-03	2.52E-03	5.64E-03	1.04E-02	1.53E-02	1.43E-02	1.30E-02	1.22E-02	1.70E-02	1.60E-02	1.70E-02	1.83E-02	1.94E-02	2.21E-02	2.42E-02	2.14E-02	1.67E-02	1.36E-02	1.26E-02	1.06E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.88E-03	1.30E-03	9.07E-04	7.07E-04	6.14E-04	1.26E-03	2.82E-03	5.22E-03	7.67E-03	7.14E-03	6.52E-03	6.12E-03	8.51E-03	8.00E-03	8.48E-03	9.14E-03	9.72E-03	1.11E-02	1.21E-02	1.07E-02	8.33E-03	6.80E-03	6.32E-03	5.32E-03
	Emission in each Box of 1st jet	g/s	7.54E-04	5.20E-04	3.63E-04	2.83E-04	2.45E-04	5.04E-04	1.13E-03	2.09E-03	3.07E-03	2.86E-03	2.61E-03	2.45E-03	3.40E-03	3.20E-03	3.39E-03	3.66E-03	3.89E-03	4.42E-03	4.84E-03	4.28E-03	3.33E-03	2.72E-03	2.53E-03	2.13E-03
	Emission in each Box of 2nd jet	g/s	6.28E-04	4.33E-04	3.02E-04	2.36E-04	2.05E-04	4.20E-04	9.39E-04	1.74E-03	2.56E-03	2.38E-03	2.17E-03	2.04E-03	2.84E-03	2.67E-03	2.83E-03	3.05E-03	3.24E-03	3.69E-03	4.04E-03	3.57E-03	2.78E-03	2.27E-03	2.11E-03	1.77E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0024***	***0.0043***	***0.0039***	***0.0035***	***0.0033***	***0.0043***	***0.0039***	***0.0042***	***0.0046***	***0.0050***	***0.0058***	***0.0064***	***0.0057***	***0.0042***	***0.0032***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.81E-04	5.32E-04	3.74E-04	2.78E-04	2.38E-04	3.35E-04	7.27E-04	1.62E-03	2.84E-03	2.63E-03	2.35E-03	2.18E-03	2.87E-03	2.61E-03	2.83E-03	3.08E-03	3.32E-03	3.85E-03	4.27E-03	3.82E-03	2.79E-03	2.10E-03	1.94E-03	1.66E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.41E-04	2.66E-04	1.87E-04	1.39E-04	1.19E-04	1.67E-04	3.63E-04	8.08E-04	1.42E-03	1.31E-03	1.17E-03	1.09E-03	1.43E-03	1.31E-03	1.42E-03	1.54E-03	1.66E-03	1.93E-03	2.13E-03	1.91E-03	1.40E-03	1.05E-03	9.72E-04	8.31E-04
	Emission in each Box of 1st jet	g/s	1.36E-04	1.06E-04	7.48E-05	5.57E-05	4.77E-05	6.69E-05	1.45E-04	3.23E-04	5.67E-04	5.25E-04	4.69E-04	4.35E-04	5.73E-04	5.23E-04	5.67E-04	6.15E-04	6.64E-04	7.70E-04	8.54E-04	7.65E-04	5.59E-04	4.20E-04	3.89E-04	3.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	8.86E-05	6.24E-05	4.64E-05	3.97E-05	5.58E-05	1.21E-04	2.69E-04	4.73E-04	4.38E-04	3.91E-04	3.63E-04	4.78E-04	4.36E-04	4.72E-04	5.13E-04	5.54E-04	6.42E-04	7.11E-04	6.37E-04	4.66E-04	3.50E-04	3.24E-04	2.77E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1092	0.0931	0.0940	0.0999	0.1009	0.1775	0.1875	0.1410	0.1353	0.1297	0.1241	0.1249	0.1605	0.1580	0.1590	0.1624	0.1672	0.1762	0.1838	0.1720	0.1581	0.1581	0.1574	0.1498
	NO2	g/vehicle/km	0.0196	0.0188	0.0192	0.0193	0.0194	0.0234	0.0240	0.0216	0.0247	0.0236	0.0222	0.0220	0.0268	0.0256	0.0263	0.0272	0.0284	0.0305	0.0322	0.0305	0.0263	0.0243	0.0241	0.0233
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0064***	***0.0045***	***0.0031***	***0.0024***	***0.0020***	***0.0042***	***0.0094***	***0.0180***	***0.0262***	***0.0244***	***0.0213***	***0.0205***	***0.0287***	***0.0264***	***0.0282***	***0.0302***	***0.0325***	***0.0369***	***0.0407***	***0.0365***	***0.0276***	***0.0227***	***0.0211***	***0.0177***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.26E-03	2.97E-03	2.06E-03	1.62E-03	1.36E-03	2.79E-03	6.26E-03	1.20E-02	1.74E-02	1.62E-02	1.42E-02	1.37E-02	1.91E-02	1.76E-02	1.88E-02	2.01E-02	2.17E-02	2.46E-02	2.71E-02	2.44E-02	1.84E-02	1.51E-02	1.41E-02	1.18E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.13E-03	1.48E-03	1.03E-03	8.10E-04	6.78E-04	1.39E-03	3.13E-03	6.01E-03	8.72E-03	8.12E-03	7.11E-03	6.85E-03	9.55E-03	8.80E-03	9.39E-03	1.01E-02	1.08E-02	1.23E-02	1.36E-02	1.22E-02	9.20E-03	7.56E-03	7.03E-03	5.89E-03
	Emission in each Box of 1st jet	g/s	8.53E-04	5.94E-04	4.12E-04	3.24E-04	2.71E-04	5.58E-04	1.25E-03	2.40E-03	3.49E-03	3.25E-03	2.84E-03	2.74E-03	3.82E-03	3.52E-03	3.76E-03	4.03E-03	4.34E-03	4.93E-03	5.43E-03	4.87E-03	3.68E-03	3.02E-03	2.81E-03	2.36E-03
	Emission in each Box of 2nd jet	g/s	7.11E-04	4.95E-04	3.44E-04	2.70E-04	2.26E-04	4.65E-04	1.04E-03	2.00E-03	2.91E-03	2.71E-03	2.37E-03	2.28E-03	3.18E-03	2.93E-03	3.13E-03	3.36E-03	3.62E-03	4.11E-03	4.52E-03	4.06E-03	3.07E-03	2.52E-03	2.34E-03	1.96E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0028***	***0.0048***	***0.0044***	***0.0038***	***0.0036***	***0.0048***	***0.0043***	***0.0047***	***0.0051***	***0.0055***	***0.0064***	***0.0071***	***0.0065***	***0.0046***	***0.0035***	***0.0032***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.64E-04	6.00E-04	4.20E-04	3.14E-04	2.60E-04	3.67E-04	8.03E-04	1.84E-03	3.19E-03	2.95E-03	2.54E-03	2.41E-03	3.19E-03	2.86E-03	3.11E-03	3.37E-03	3.69E-03	4.26E-03	4.75E-03	4.32E-03	3.06E-03	2.32E-03	2.15E-03	1.83E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.82E-04	3.00E-04	2.10E-04	1.57E-04	1.30E-04	1.84E-04	4.01E-04	9.22E-04	1.59E-03	1.48E-03	1.27E-03	1.21E-03	1.60E-03	1.43E-03	1.56E-03	1.68E-03	1.84E-03	2.13E-03	2.38E-03	2.16E-03	1.53E-03	1.16E-03	1.08E-03	9.15E-04
	Emission in each Box of 1st jet	g/s	1.53E-04	1.20E-04	8.41E-05	6.28E-05	5.20E-05	7.35E-05	1.61E-04	3.69E-04	6.38E-04	5.91E-04	5.09E-04	4.83E-04	6.39E-04	5.71E-04	6.22E-04	6.73E-04	7.38E-04	8.53E-04	9.51E-04	8.63E-04	6.12E-04	4.64E-04	4.30E-04	3.66E-04
	Emission in each Box of 2nd jet	g/s	1.27E-04	1.00E-04	7.01E-05	5.23E-05	4.34E-05	6.12E-05	1.34E-04	3.07E-04	5.32E-04	4.92E-04	4.24E-04	4.02E-04	5.32E-04	4.76E-04	5.19E-04	5.61E-04	6.15E-04	7.11E-04	7.92E-04	7.19E-04	5.10E-04	3.87E-04	3.58E-04	3.05E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1201	0.1039	0.1052	0.1127	0.1143	0.2006	0.2114	0.1588	0.1529	0.1471	0.1408	0.1407	0.1781	0.1752	0.1764	0.1803	0.1847	0.1980	0.2024	0.1923	0.1757	0.1758	0.1752	0.1675
	NO2	g/vehicle/km	0.0213	0.0207	0.0211	0.0215	0.0216	0.0262	0.0268	0.0241	0.0277	0.0265	0.0250	0.0246	0.0296	0.0283	0.0291	0.0300	0.0311	0.0340	0.0352	0.0338	0.0290	0.0268	0.0266	0.0258
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0070***	***0.0050***	***0.0035***	***0.0027***	***0.0023***	***0.0047***	***0.0106***	***0.0203***	***0.0296***	***0.0276***	***0.0242***	***0.0231***	***0.0318***	***0.0293***	***0.0313***	***0.0335***	***0.0360***	***0.0415***	***0.0448***	***0.0409***	***0.0307***	***0.0252***	***0.0235***	***0.0198***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.69E-03	3.31E-03	2.31E-03	1.83E-03	1.54E-03	3.15E-03	7.06E-03	1.35E-02	1.97E-02	1.84E-02	1.61E-02	1.54E-02	2.12E-02	1.95E-02	2.08E-02	2.24E-02	2.40E-02	2.77E-02	2.99E-02	2.72E-02	2.05E-02	1.68E-02	1.57E-02	1.32E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.34E-03	1.66E-03	1.15E-03	9.14E-04	7.68E-04	1.58E-03	3.53E-03	6.77E-03	9.86E-03	9.21E-03	8.06E-03	7.71E-03	1.06E-02	9.76E-03	1.04E-02	1.12E-02	1.20E-02	1.38E-02	1.49E-02	1.36E-02	1.02E-02	8.40E-03	7.83E-03	6.59E-03
	Emission in each Box of 1st jet	g/s	9.38E-04	6.62E-04	4.61E-04	3.66E-04	3.07E-04	6.30E-04	1.41E-03	2.71E-03	3.94E-03	3.68E-03	3.23E-03	3.08E-03	4.24E-03	3.90E-03	4.17E-03	4.47E-03	4.79E-03	5.54E-03	5.98E-03	5.45E-03	4.09E-03	3.36E-03	3.13E-03	2.64E-03
	Emission in each Box of 2nd jet	g/s	7.82E-04	5.52E-04	3.84E-04	3.05E-04	2.56E-04	5.25E-04	1.18E-03	2.26E-03	3.29E-03	3.07E-03	2.69E-03	2.57E-03	3.53E-03	3.25E-03	3.47E-03	3.73E-03	3.99E-03	4.61E-03	4.98E-03	4.54E-03	3.41E-03	2.80E-03	2.61E-03	2.20E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0031***	***0.0054***	***0.0050***	***0.0043***	***0.0040***	***0.0053***	***0.0047***	***0.0051***	***0.0056***	***0.0061***	***0.0071***	***0.0078***	***0.0072***	***0.0051***	***0.0038***	***0.0036***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.31E-04	6.59E-04	4.63E-04	3.50E-04	2.91E-04	4.11E-04	8.96E-04	2.06E-03	3.58E-03	3.32E-03	2.86E-03	2.70E-03	3.52E-03	3.15E-03	3.43E-03	3.71E-03	4.04E-03	4.75E-03	5.20E-03	4.79E-03	3.38E-03	2.56E-03	2.38E-03	2.03E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.15E-04	3.29E-04	2.31E-04	1.75E-04	1.46E-04	2.06E-04	4.48E-04	1.03E-03	1.79E-03	1.66E-03	1.43E-03	1.35E-03	1.76E-03	1.57E-03	1.72E-03	1.86E-03	2.02E-03	2.38E-03	2.60E-03	2.39E-03	1.69E-03	1.28E-03	1.19E-03	1.02E-03
	Emission in each Box of 1st jet	g/s	1.66E-04	1.32E-04	9.25E-05	6.99E-05	5.82E-05	8.23E-05	1.79E-04	4.12E-04	7.16E-04	6.64E-04	5.72E-04	5.39E-04	7.04E-04	6.30E-04	6.86E-04	7.43E-04	8.08E-04	9.51E-04	1.04E-03	9.57E-04	6.76E-04	5.12E-04	4.75E-04	4.06E-04
	Emission in each Box of 2nd jet	g/s	1.38E-04	1.10E-04	7.71E-05	5.83E-05	4.85E-05	6.86E-05	1.49E-04	3.43E-04	5.97E-04	5.53E-04	4.76E-04	4.50E-04	5.87E-04	5.25E-04	5.72E-04	6.19E-04	6.73E-04	7.92E-04	8.67E-04	7.98E-04	5.63E-04	4.27E-04	3.96E-04	3.39E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1150	939	646	478	396	463	984	2511	3800	3688	3375	3228	3506	3282	3480	3653	3823	4118	4349	4174	3431	2817	2632	2318
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1271	0.1091	0.1104	0.1177	0.1209	0.2104	0.2211	0.1661	0.1599	0.1535	0.1464	0.1467	0.1850	0.1821	0.1838	0.1874	0.1919	0.2053	0.2120	0.1989	0.1824	0.1820	0.1838	0.1757
	NO2	g/vehicle/km	0.0224	0.0215	0.0220	0.0223	0.0227	0.0273	0.0279	0.0251	0.0288	0.0275	0.0258	0.0255	0.0307	0.0293	0.0302	0.0311	0.0323	0.0351	0.0367	0.0348	0.0300	0.0276	0.0277	0.0269
	RSP	g/vehicle/km	0.0087	0.0074	0.0075	0.0080	0.0081	0.0145	0.0152	0.0112	0.0099	0.0096	0.0095	0.0096	0.0121	0.0122	0.0121	0.0122	0.0123	0.0128	0.0129	0.0123	0.0120	0.0126	0.0126	0.0120
	FSP	g/vehicle/km	0.0080	0.0068	0.0069	0.0073	0.0074	0.0133	0.0140	0.0103	0.0090	0.0089	0.0088	0.0088	0.0111	0.0112	0.0111	0.0113	0.0113	0.0118	0.0119	0.0113	0.0110	0.0115	0.0115	0.0111
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0074***	***0.0052***	***0.0036***	***0.0029***	***0.0024***	***0.0050***	***0.0111***	***0.0212***	***0.0309***	***0.0288***	***0.0252***	***0.0241***	***0.0330***	***0.0304***	***0.0326***	***0.0349***	***0.0373***	***0.0430***	***0.0469***	***0.0423***	***0.0319***	***0.0261***	***0.0246***	***0.0207***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.96E-03	3.48E-03	2.42E-03	1.91E-03	1.62E-03	3.31E-03	7.39E-03	1.42E-02	2.06E-02	1.92E-02	1.68E-02	1.61E-02	2.20E-02	2.03E-02	2.17E-02	2.32E-02	2.49E-02	2.87E-02	3.13E-02	2.82E-02	2.12E-02	1.74E-02	1.64E-02	1.38E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.48E-03	1.74E-03	1.21E-03	9.55E-04	8.12E-04	1.65E-03	3.69E-03	7.08E-03	1.03E-02	9.61E-03	8.39E-03	8.04E-03	1.10E-02	1.01E-02	1.09E-02	1.16E-02	1.24E-02	1.43E-02	1.56E-02	1.41E-02	1.06E-02	8.70E-03	8.21E-03	6.91E-03
	Emission in each Box of 1st jet	g/s	9.93E-04	6.96E-04	4.84E-04	3.82E-04	3.25E-04	6.61E-04	1.48E-03	2.83E-03	4.12E-03	3.84E-03	3.35E-03	3.21E-03	4.40E-03	4.06E-03	4.34E-03	4.65E-03	4.98E-03	5.74E-03	6.26E-03	5.64E-03	4.25E-03	3.48E-03	3.28E-03	2.77E-03
	Emission in each Box of 2nd jet	g/s	8.27E-04	5.80E-04	4.04E-04	3.18E-04	2.71E-04	5.51E-04	1.23E-03	2.36E-03	3.44E-03	3.20E-03	2.80E-03	2.68E-03	3.67E-03	3.38E-03	3.62E-03	3.87E-03	4.15E-03	4.78E-03	5.22E-03	4.70E-03	3.54E-03	2.90E-03	2.74E-03	2.30E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0006***	***0.0014***	***0.0032***	***0.0056***	***0.0052***	***0.0044***	***0.0042***	***0.0055***	***0.0049***	***0.0053***	***0.0058***	***0.0063***	***0.0074***	***0.0081***	***0.0074***	***0.0052***	***0.0040***	***0.0037***	***0.0032***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.73E-04	6.87E-04	4.82E-04	3.62E-04	3.05E-04	4.29E-04	9.32E-04	2.14E-03	3.71E-03	3.45E-03	2.96E-03	2.80E-03	3.65E-03	3.26E-03	3.56E-03	3.86E-03	4.19E-03	4.91E-03	5.42E-03	4.93E-03	3.49E-03	2.64E-03	2.47E-03	2.12E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.36E-04	3.43E-04	2.41E-04	1.81E-04	1.52E-04	2.15E-04	4.66E-04	1.07E-03	1.86E-03	1.72E-03	1.48E-03	1.40E-03	1.83E-03	1.63E-03	1.78E-03	1.93E-03	2.09E-03	2.45E-03	2.71E-03	2.46E-03	1.75E-03	1.32E-03	1.24E-03	1.06E-03
	Emission in each Box of 1st jet	g/s	1.75E-04	1.37E-04	9.65E-05	7.25E-05	6.09E-05	8.59E-05	1.86E-04	4.27E-04	7.42E-04	6.89E-04	5.92E-04	5.59E-04	7.30E-04	6.52E-04	7.13E-04	7.71E-04	8.38E-04	9.81E-04	1.08E-03	9.85E-04	6.99E-04	5.27E-04	4.95E-04	4.23E-04
	Emission in each Box of 2nd jet	g/s	1.45E-04	1.14E-04	8.04E-05	6.04E-05	5.08E-05	7.16E-05	1.55E-04	3.56E-04	6.18E-04	5.74E-04	4.93E-04	4.66E-04	6.08E-04	5.43E-04	5.94E-04	6.43E-04	6.98E-04	8.18E-04	9.04E-04	8.21E-04	5.82E-04	4.39E-04	4.12E-04	3.53E-04
RSP Emission Rate		g/s	***5.08E-04***	***3.52E-04***	***2.47E-04***	***1.95E-04***	***1.64E-04***	***3.41E-04***	***7.63E-04***	***1.43E-03***	***1.91E-03***	***1.81E-03***	***1.64E-03***	***1.58E-03***	***2.16E-03***	***2.04E-03***	***2.14E-03***	***2.27E-03***	***2.40E-03***	***2.69E-03***	***2.86E-03***	***2.61E-03***	***2.09E-03***	***1.80E-03***	***1.69E-03***	***1.42E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.39E-04	2.35E-04	1.64E-04	1.30E-04	1.09E-04	2.27E-04	5.09E-04	9.51E-04	1.27E-03	1.20E-03	1.09E-03	1.05E-03	1.44E-03	1.36E-03	1.42E-03	1.52E-03	1.60E-03	1.79E-03	1.91E-03	1.74E-03	1.40E-03	1.20E-03	1.13E-03	9.45E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.69E-04	1.17E-04	8.22E-05	6.49E-05	5.47E-05	1.14E-04	2.54E-04	4.76E-04	6.36E-04	6.02E-04	5.47E-04	5.26E-04	7.21E-04	6.80E-04	7.12E-04	7.58E-04	8.00E-04	8.96E-04	9.54E-04	8.70E-04	6.98E-04	6.01E-04	5.63E-04	4.73E-04
	Emission in each Box of 1st jet	g/s	6.78E-05	4.70E-05	3.29E-05	2.60E-05	2.19E-05	4.55E-05	1.02E-04	1.90E-04	2.55E-04	2.41E-04	2.19E-04	2.10E-04	2.89E-04	2.72E-04	2.85E-04	3.03E-04	3.20E-04	3.58E-04	3.82E-04	3.48E-04	2.79E-04	2.40E-04	2.25E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	5.65E-05	3.91E-05	2.74E-05	2.16E-05	1.82E-05	3.79E-05	8.48E-05	1.59E-04	2.12E-04	2.01E-04	1.82E-04	1.75E-04	2.40E-04	2.27E-04	2.37E-04	2.53E-04	2.67E-04	2.99E-04	3.18E-04	2.90E-04	2.33E-04	2.00E-04	1.88E-04	1.58E-04
FSP Emission Rate		g/s	***4.68E-04***	***3.24E-04***	***2.27E-04***	***1.78E-04***	***1.50E-04***	***3.13E-04***	***7.03E-04***	***1.31E-03***	***1.75E-03***	***1.67E-03***	***1.51E-03***	***1.45E-03***	***1.98E-03***	***1.87E-03***	***1.97E-03***	***2.09E-03***	***2.20E-03***	***2.47E-03***	***2.63E-03***	***2.40E-03***	***1.93E-03***	***1.65E-03***	***1.55E-03***	***1.31E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.12E-04	2.16E-04	1.51E-04	1.19E-04	1.00E-04	2.08E-04	4.68E-04	8.76E-04	1.17E-03	1.11E-03	1.01E-03	9.63E-04	1.32E-03	1.25E-03	1.31E-03	1.40E-03	1.47E-03	1.65E-03	1.75E-03	1.60E-03	1.29E-03	1.10E-03	1.03E-03	8.71E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.56E-04	1.08E-04	7.57E-05	5.94E-05	5.00E-05	1.04E-04	2.34E-04	4.38E-04	5.83E-04	5.55E-04	5.05E-04	4.82E-04	6.62E-04	6.23E-04	6.56E-04	6.98E-04	7.34E-04	8.23E-04	8.76E-04	7.99E-04	6.43E-04	5.51E-04	5.15E-04	4.35E-04
	Emission in each Box of 1st jet	g/s	6.24E-05	4.33E-05	3.03E-05	2.37E-05	2.00E-05	4.17E-05	9.37E-05	1.75E-04	2.33E-04	2.22E-04	2.02E-04	1.93E-04	2.65E-04	2.49E-04	2.63E-04	2.79E-04	2.94E-04	3.29E-04	3.51E-04	3.19E-04	2.57E-04	2.20E-04	2.06E-04	1.74E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.60E-05	2.52E-05	1.98E-05	1.67E-05	3.47E-05	7.81E-05	1.46E-04	1.94E-04	1.85E-04	1.68E-04	1.61E-04	2.21E-04	2.08E-04	2.19E-04	2.33E-04	2.45E-04	2.74E-04	2.92E-04	2.66E-04	2.14E-04	1.84E-04	1.72E-04	1.45E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1405	0.1200	0.1223	0.1272	0.1298	0.2391	0.2553	0.1934	0.2292	0.2119	0.1952	0.1888	0.1496	0.1453	0.1479	0.1571	0.1637	0.1734	0.1850	0.1755	0.1478	0.1341	0.1330	0.1298
	NO2	g/vehicle/km	0.0240	0.0232	0.0234	0.0237	0.0239	0.0298	0.0307	0.0288	0.0421	0.0387	0.0351	0.0335	0.0297	0.0285	0.0294	0.0315	0.0330	0.0351	0.0380	0.0360	0.0293	0.0254	0.0249	0.0244
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0158***	***0.0110***	***0.0077***	***0.0059***	***0.0051***	***0.0110***	***0.0249***	***0.0478***	***0.0855***	***0.0767***	***0.0646***	***0.0598***	***0.0434***	***0.0393***	***0.0426***	***0.0475***	***0.0518***	***0.0592***	***0.0668***	***0.0610***	***0.0419***	***0.0310***	***0.0288***	***0.0249***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.06E-02	7.35E-03	5.16E-03	3.96E-03	3.37E-03	7.31E-03	1.66E-02	3.19E-02	5.70E-02	5.11E-02	4.31E-02	3.99E-02	2.89E-02	2.62E-02	2.84E-02	3.17E-02	3.46E-02	3.95E-02	4.46E-02	4.06E-02	2.80E-02	2.07E-02	1.92E-02	1.66E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.28E-03	3.68E-03	2.58E-03	1.98E-03	1.69E-03	3.65E-03	8.31E-03	1.59E-02	2.85E-02	2.56E-02	2.15E-02	1.99E-02	1.45E-02	1.31E-02	1.42E-02	1.58E-02	1.73E-02	1.97E-02	2.23E-02	2.03E-02	1.40E-02	1.03E-02	9.62E-03	8.31E-03
	Emission in each Box of 1st jet	g/s	2.11E-03	1.47E-03	1.03E-03	7.92E-04	6.75E-04	1.46E-03	3.32E-03	6.38E-03	1.14E-02	1.02E-02	8.62E-03	7.98E-03	5.78E-03	5.25E-03	5.68E-03	6.33E-03	6.91E-03	7.89E-03	8.91E-03	8.13E-03	5.59E-03	4.13E-03	3.85E-03	3.32E-03
	Emission in each Box of 2nd jet	g/s	1.76E-03	1.23E-03	8.60E-04	6.60E-04	5.62E-04	1.22E-03	2.77E-03	5.32E-03	9.50E-03	8.52E-03	7.18E-03	6.65E-03	4.82E-03	4.37E-03	4.73E-03	5.28E-03	5.76E-03	6.58E-03	7.43E-03	6.77E-03	4.66E-03	3.45E-03	3.21E-03	2.77E-03
NO_2 Emission Rate		g/s	***0.0027***	***0.0021***	***0.0015***	***0.0011***	***0.0009***	***0.0014***	***0.0030***	***0.0071***	***0.0157***	***0.0140***	***0.0116***	***0.0106***	***0.0086***	***0.0077***	***0.0085***	***0.0095***	***0.0104***	***0.0120***	***0.0137***	***0.0125***	***0.0083***	***0.0059***	***0.0054***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.81E-03	1.42E-03	9.88E-04	7.39E-04	6.22E-04	9.11E-04	2.00E-03	4.75E-03	1.05E-02	9.33E-03	7.74E-03	7.09E-03	5.74E-03	5.14E-03	5.64E-03	6.35E-03	6.96E-03	7.99E-03	9.14E-03	8.33E-03	5.55E-03	3.91E-03	3.60E-03	3.12E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.04E-04	7.10E-04	4.94E-04	3.69E-04	3.11E-04	4.55E-04	1.00E-03	2.37E-03	5.23E-03	4.66E-03	3.87E-03	3.54E-03	2.87E-03	2.57E-03	2.82E-03	3.18E-03	3.48E-03	4.00E-03	4.57E-03	4.17E-03	2.77E-03	1.96E-03	1.80E-03	1.56E-03
	Emission in each Box of 1st jet	g/s	3.62E-04	2.84E-04	1.98E-04	1.48E-04	1.24E-04	1.82E-04	4.00E-04	9.50E-04	2.09E-03	1.87E-03	1.55E-03	1.42E-03	1.15E-03	1.03E-03	1.13E-03	1.27E-03	1.39E-03	1.60E-03	1.83E-03	1.67E-03	1.11E-03	7.82E-04	7.20E-04	6.25E-04
	Emission in each Box of 2nd jet	g/s	3.01E-04	2.37E-04	1.65E-04	1.23E-04	1.04E-04	1.52E-04	3.34E-04	7.91E-04	1.74E-03	1.55E-03	1.29E-03	1.18E-03	9.57E-04	8.57E-04	9.40E-04	1.06E-03	1.16E-03	1.33E-03	1.52E-03	1.39E-03	9.24E-04	6.52E-04	6.00E-04	5.21E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1310	0.1106	0.1125	0.1184	0.1207	0.2233	0.2362	0.1805	0.2119	0.1933	0.1794	0.1736	0.1374	0.1345	0.1380	0.1453	0.1511	0.1609	0.1715	0.1640	0.1379	0.1254	0.1228	0.1197
	NO2	g/vehicle/km	0.0226	0.0217	0.0219	0.0223	0.0225	0.0280	0.0287	0.0271	0.0392	0.0357	0.0325	0.0311	0.0275	0.0266	0.0277	0.0294	0.0308	0.0330	0.0356	0.0339	0.0276	0.0240	0.0233	0.0228
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0148***	***0.0102***	***0.0071***	***0.0055***	***0.0047***	***0.0102***	***0.0231***	***0.0447***	***0.0790***	***0.0700***	***0.0594***	***0.0550***	***0.0398***	***0.0364***	***0.0397***	***0.0439***	***0.0478***	***0.0549***	***0.0620***	***0.0570***	***0.0391***	***0.0290***	***0.0266***	***0.0230***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.85E-03	6.78E-03	4.75E-03	3.69E-03	3.14E-03	6.82E-03	1.54E-02	2.98E-02	5.27E-02	4.66E-02	3.96E-02	3.67E-02	2.65E-02	2.43E-02	2.65E-02	2.93E-02	3.19E-02	3.66E-02	4.13E-02	3.80E-02	2.61E-02	1.93E-02	1.77E-02	1.53E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.93E-03	3.39E-03	2.37E-03	1.84E-03	1.57E-03	3.41E-03	7.69E-03	1.49E-02	2.63E-02	2.33E-02	1.98E-02	1.83E-02	1.33E-02	1.21E-02	1.32E-02	1.46E-02	1.59E-02	1.83E-02	2.07E-02	1.90E-02	1.30E-02	9.66E-03	8.87E-03	7.66E-03
	Emission in each Box of 1st jet	g/s	1.97E-03	1.36E-03	9.49E-04	7.37E-04	6.28E-04	1.36E-03	3.08E-03	5.96E-03	1.05E-02	9.33E-03	7.92E-03	7.34E-03	5.31E-03	4.85E-03	5.30E-03	5.86E-03	6.38E-03	7.32E-03	8.26E-03	7.60E-03	5.22E-03	3.87E-03	3.55E-03	3.07E-03
	Emission in each Box of 2nd jet	g/s	1.64E-03	1.13E-03	7.91E-04	6.14E-04	5.23E-04	1.14E-03	2.56E-03	4.96E-03	8.78E-03	7.77E-03	6.60E-03	6.11E-03	4.42E-03	4.04E-03	4.41E-03	4.88E-03	5.32E-03	6.10E-03	6.88E-03	6.33E-03	4.35E-03	3.22E-03	2.96E-03	2.55E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0010***	***0.0009***	***0.0013***	***0.0028***	***0.0067***	***0.0146***	***0.0129***	***0.0108***	***0.0099***	***0.0080***	***0.0072***	***0.0080***	***0.0089***	***0.0097***	***0.0112***	***0.0129***	***0.0118***	***0.0078***	***0.0055***	***0.0050***	***0.0044***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.70E-03	1.33E-03	9.22E-04	6.95E-04	5.85E-04	8.56E-04	1.87E-03	4.46E-03	9.76E-03	8.62E-03	7.18E-03	6.57E-03	5.31E-03	4.80E-03	5.31E-03	5.93E-03	6.49E-03	7.50E-03	8.57E-03	7.86E-03	5.23E-03	3.69E-03	3.36E-03	2.91E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.50E-04	6.64E-04	4.61E-04	3.48E-04	2.93E-04	4.28E-04	9.33E-04	2.23E-03	4.88E-03	4.31E-03	3.59E-03	3.29E-03	2.66E-03	2.40E-03	2.66E-03	2.96E-03	3.25E-03	3.75E-03	4.29E-03	3.93E-03	2.61E-03	1.85E-03	1.68E-03	1.46E-03
	Emission in each Box of 1st jet	g/s	3.40E-04	2.66E-04	1.84E-04	1.39E-04	1.17E-04	1.71E-04	3.73E-04	8.93E-04	1.95E-03	1.72E-03	1.44E-03	1.31E-03	1.06E-03	9.60E-04	1.06E-03	1.19E-03	1.30E-03	1.50E-03	1.71E-03	1.57E-03	1.05E-03	7.38E-04	6.73E-04	5.83E-04
	Emission in each Box of 2nd jet	g/s	2.83E-04	2.21E-04	1.54E-04	1.16E-04	9.75E-05	1.43E-04	3.11E-04	7.44E-04	1.63E-03	1.44E-03	1.20E-03	1.10E-03	8.85E-04	8.00E-04	8.86E-04	9.88E-04	1.08E-03	1.25E-03	1.43E-03	1.31E-03	8.71E-04	6.15E-04	5.61E-04	4.86E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1233	0.1043	0.1062	0.1101	0.1122	0.2089	0.2215	0.1694	0.1995	0.1838	0.1685	0.1654	0.1308	0.1260	0.1294	0.1380	0.1419	0.1519	0.1630	0.1544	0.1293	0.1175	0.1150	0.1124
	NO2	g/vehicle/km	0.0214	0.0206	0.0208	0.0210	0.0212	0.0264	0.0270	0.0256	0.0372	0.0341	0.0308	0.0297	0.0263	0.0251	0.0261	0.0280	0.0290	0.0313	0.0340	0.0322	0.0261	0.0226	0.0219	0.0215
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0139***	***0.0096***	***0.0067***	***0.0051***	***0.0044***	***0.0096***	***0.0216***	***0.0419***	***0.0744***	***0.0665***	***0.0558***	***0.0524***	***0.0379***	***0.0341***	***0.0372***	***0.0417***	***0.0449***	***0.0518***	***0.0589***	***0.0536***	***0.0367***	***0.0272***	***0.0249***	***0.0216***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.28E-03	6.39E-03	4.48E-03	3.43E-03	2.92E-03	6.38E-03	1.44E-02	2.79E-02	4.96E-02	4.44E-02	3.72E-02	3.50E-02	2.53E-02	2.27E-02	2.48E-02	2.78E-02	3.00E-02	3.46E-02	3.93E-02	3.58E-02	2.45E-02	1.81E-02	1.66E-02	1.44E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.64E-03	3.19E-03	2.24E-03	1.71E-03	1.46E-03	3.19E-03	7.21E-03	1.40E-02	2.48E-02	2.22E-02	1.86E-02	1.75E-02	1.26E-02	1.14E-02	1.24E-02	1.39E-02	1.50E-02	1.73E-02	1.96E-02	1.79E-02	1.22E-02	9.06E-03	8.31E-03	7.20E-03
	Emission in each Box of 1st jet	g/s	1.86E-03	1.28E-03	8.96E-04	6.85E-04	5.84E-04	1.28E-03	2.88E-03	5.59E-03	9.92E-03	8.87E-03	7.44E-03	6.99E-03	5.06E-03	4.55E-03	4.97E-03	5.56E-03	5.99E-03	6.91E-03	7.85E-03	7.15E-03	4.89E-03	3.62E-03	3.32E-03	2.88E-03
	Emission in each Box of 2nd jet	g/s	1.55E-03	1.06E-03	7.47E-04	5.71E-04	4.86E-04	1.06E-03	2.40E-03	4.66E-03	8.27E-03	7.39E-03	6.20E-03	5.83E-03	4.21E-03	3.79E-03	4.14E-03	4.64E-03	4.99E-03	5.76E-03	6.55E-03	5.96E-03	4.08E-03	3.02E-03	2.77E-03	2.40E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0012***	***0.0026***	***0.0063***	***0.0139***	***0.0123***	***0.0102***	***0.0094***	***0.0076***	***0.0068***	***0.0075***	***0.0085***	***0.0092***	***0.0107***	***0.0123***	***0.0112***	***0.0074***	***0.0052***	***0.0048***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.61E-03	1.26E-03	8.78E-04	6.54E-04	5.51E-04	8.06E-04	1.76E-03	4.22E-03	9.24E-03	8.22E-03	6.79E-03	6.28E-03	5.09E-03	4.53E-03	5.01E-03	5.65E-03	6.12E-03	7.12E-03	8.18E-03	7.45E-03	4.93E-03	3.48E-03	3.17E-03	2.75E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.06E-04	6.30E-04	4.39E-04	3.27E-04	2.75E-04	4.03E-04	8.80E-04	2.11E-03	4.62E-03	4.11E-03	3.40E-03	3.14E-03	2.54E-03	2.26E-03	2.50E-03	2.82E-03	3.06E-03	3.56E-03	4.09E-03	3.72E-03	2.47E-03	1.74E-03	1.59E-03	1.38E-03
	Emission in each Box of 1st jet	g/s	3.22E-04	2.52E-04	1.76E-04	1.31E-04	1.10E-04	1.61E-04	3.52E-04	8.44E-04	1.85E-03	1.64E-03	1.36E-03	1.26E-03	1.02E-03	9.06E-04	1.00E-03	1.13E-03	1.22E-03	1.42E-03	1.64E-03	1.49E-03	9.87E-04	6.97E-04	6.35E-04	5.51E-04
	Emission in each Box of 2nd jet	g/s	2.69E-04	2.10E-04	1.46E-04	1.09E-04	9.18E-05	1.34E-04	2.93E-04	7.03E-04	1.54E-03	1.37E-03	1.13E-03	1.05E-03	8.48E-04	7.55E-04	8.34E-04	9.41E-04	1.02E-03	1.19E-03	1.36E-03	1.24E-03	8.22E-04	5.81E-04	5.29E-04	4.59E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1156	0.0976	0.0989	0.1052	0.1073	0.2008	0.2130	0.1612	0.1898	0.1750	0.1603	0.1571	0.1242	0.1216	0.1250	0.1308	0.1374	0.1444	0.1550	0.1461	0.1224	0.1132	0.1102	0.1073
	NO2	g/vehicle/km	0.0203	0.0194	0.0196	0.0202	0.0204	0.0254	0.0261	0.0244	0.0355	0.0326	0.0293	0.0283	0.0251	0.0243	0.0253	0.0267	0.0282	0.0298	0.0325	0.0305	0.0249	0.0219	0.0211	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0130***	***0.0090***	***0.0063***	***0.0049***	***0.0042***	***0.0092***	***0.0208***	***0.0399***	***0.0708***	***0.0633***	***0.0531***	***0.0498***	***0.0360***	***0.0329***	***0.0360***	***0.0396***	***0.0435***	***0.0493***	***0.0560***	***0.0507***	***0.0347***	***0.0262***	***0.0239***	***0.0206***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.70E-03	5.98E-03	4.17E-03	3.27E-03	2.79E-03	6.14E-03	1.39E-02	2.66E-02	4.72E-02	4.22E-02	3.54E-02	3.32E-02	2.40E-02	2.20E-02	2.40E-02	2.64E-02	2.90E-02	3.28E-02	3.73E-02	3.38E-02	2.32E-02	1.74E-02	1.59E-02	1.37E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.35E-03	2.99E-03	2.09E-03	1.64E-03	1.39E-03	3.07E-03	6.94E-03	1.33E-02	2.36E-02	2.11E-02	1.77E-02	1.66E-02	1.20E-02	1.10E-02	1.20E-02	1.32E-02	1.45E-02	1.64E-02	1.87E-02	1.69E-02	1.16E-02	8.72E-03	7.97E-03	6.87E-03
	Emission in each Box of 1st jet	g/s	1.74E-03	1.20E-03	8.35E-04	6.55E-04	5.58E-04	1.23E-03	2.77E-03	5.32E-03	9.44E-03	8.44E-03	7.08E-03	6.64E-03	4.80E-03	4.39E-03	4.79E-03	5.27E-03	5.80E-03	6.57E-03	7.47E-03	6.77E-03	4.63E-03	3.49E-03	3.19E-03	2.75E-03
	Emission in each Box of 2nd jet	g/s	1.45E-03	9.96E-04	6.95E-04	5.46E-04	4.65E-04	1.02E-03	2.31E-03	4.43E-03	7.87E-03	7.04E-03	5.90E-03	5.53E-03	4.00E-03	3.66E-03	4.00E-03	4.40E-03	4.84E-03	5.47E-03	6.22E-03	5.64E-03	3.86E-03	2.91E-03	2.66E-03	2.29E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0025***	***0.0060***	***0.0133***	***0.0118***	***0.0097***	***0.0090***	***0.0073***	***0.0066***	***0.0073***	***0.0081***	***0.0089***	***0.0102***	***0.0117***	***0.0106***	***0.0071***	***0.0051***	***0.0046***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.52E-03	1.19E-03	8.27E-04	6.29E-04	5.30E-04	7.77E-04	1.70E-03	4.03E-03	8.84E-03	7.86E-03	6.47E-03	5.99E-03	4.85E-03	4.39E-03	4.85E-03	5.38E-03	5.95E-03	6.79E-03	7.82E-03	7.07E-03	4.70E-03	3.37E-03	3.06E-03	2.64E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.62E-04	5.96E-04	4.13E-04	3.15E-04	2.65E-04	3.89E-04	8.50E-04	2.01E-03	4.42E-03	3.93E-03	3.24E-03	2.99E-03	2.42E-03	2.19E-03	2.42E-03	2.69E-03	2.97E-03	3.39E-03	3.91E-03	3.54E-03	2.35E-03	1.68E-03	1.53E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	3.05E-04	2.38E-04	1.65E-04	1.26E-04	1.06E-04	1.55E-04	3.40E-04	8.05E-04	1.77E-03	1.57E-03	1.29E-03	1.20E-03	9.70E-04	8.77E-04	9.69E-04	1.08E-03	1.19E-03	1.36E-03	1.56E-03	1.41E-03	9.40E-04	6.74E-04	6.11E-04	5.29E-04
	Emission in each Box of 2nd jet	g/s	2.54E-04	1.99E-04	1.38E-04	1.05E-04	8.83E-05	1.30E-04	2.83E-04	6.71E-04	1.47E-03	1.31E-03	1.08E-03	9.98E-04	8.08E-04	7.31E-04	8.08E-04	8.97E-04	9.91E-04	1.13E-03	1.30E-03	1.18E-03	7.83E-04	5.61E-04	5.09E-04	4.41E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1037	0.0868	0.0884	0.0914	0.0932	0.1750	0.1834	0.1397	0.1669	0.1531	0.1426	0.1394	0.1109	0.1082	0.1119	0.1166	0.1221	0.1302	0.1363	0.1308	0.1093	0.0981	0.0963	0.0936
	NO2	g/vehicle/km	0.0183	0.0175	0.0177	0.0178	0.0180	0.0224	0.0227	0.0213	0.0315	0.0287	0.0262	0.0253	0.0226	0.0218	0.0228	0.0239	0.0252	0.0270	0.0287	0.0275	0.0224	0.0192	0.0187	0.0182
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0117***	***0.0080***	***0.0056***	***0.0043***	***0.0036***	***0.0080***	***0.0179***	***0.0346***	***0.0622***	***0.0554***	***0.0472***	***0.0442***	***0.0321***	***0.0293***	***0.0322***	***0.0353***	***0.0387***	***0.0444***	***0.0492***	***0.0454***	***0.0310***	***0.0227***	***0.0209***	***0.0180***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.80E-03	5.32E-03	3.73E-03	2.84E-03	2.42E-03	5.35E-03	1.19E-02	2.31E-02	4.15E-02	3.69E-02	3.15E-02	2.95E-02	2.14E-02	1.95E-02	2.15E-02	2.35E-02	2.58E-02	2.96E-02	3.28E-02	3.03E-02	2.07E-02	1.51E-02	1.39E-02	1.20E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.90E-03	2.66E-03	1.86E-03	1.42E-03	1.21E-03	2.67E-03	5.97E-03	1.15E-02	2.07E-02	1.85E-02	1.57E-02	1.47E-02	1.07E-02	9.76E-03	1.07E-02	1.18E-02	1.29E-02	1.48E-02	1.64E-02	1.51E-02	1.03E-02	7.56E-03	6.96E-03	5.99E-03
	Emission in each Box of 1st jet	g/s	1.56E-03	1.06E-03	7.46E-04	5.69E-04	4.84E-04	1.07E-03	2.39E-03	4.61E-03	8.30E-03	7.39E-03	6.30E-03	5.89E-03	4.29E-03	3.90E-03	4.29E-03	4.70E-03	5.16E-03	5.93E-03	6.56E-03	6.06E-03	4.14E-03	3.02E-03	2.78E-03	2.40E-03
	Emission in each Box of 2nd jet	g/s	1.30E-03	8.86E-04	6.21E-04	4.74E-04	4.04E-04	8.91E-04	1.99E-03	3.84E-03	6.92E-03	6.16E-03	5.25E-03	4.91E-03	3.57E-03	3.25E-03	3.58E-03	3.92E-03	4.30E-03	4.94E-03	5.47E-03	5.05E-03	3.45E-03	2.52E-03	2.32E-03	2.00E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0022***	***0.0053***	***0.0117***	***0.0104***	***0.0087***	***0.0080***	***0.0065***	***0.0059***	***0.0065***	***0.0072***	***0.0080***	***0.0092***	***0.0104***	***0.0096***	***0.0063***	***0.0044***	***0.0041***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.38E-03	1.07E-03	7.46E-04	5.55E-04	4.67E-04	6.83E-04	1.48E-03	3.52E-03	7.82E-03	6.92E-03	5.79E-03	5.35E-03	4.36E-03	3.93E-03	4.36E-03	4.82E-03	5.32E-03	6.15E-03	6.92E-03	6.38E-03	4.23E-03	2.95E-03	2.70E-03	2.33E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.89E-04	5.36E-04	3.73E-04	2.77E-04	2.34E-04	3.42E-04	7.38E-04	1.76E-03	3.91E-03	3.46E-03	2.90E-03	2.68E-03	2.18E-03	1.96E-03	2.18E-03	2.41E-03	2.66E-03	3.08E-03	3.46E-03	3.19E-03	2.12E-03	1.48E-03	1.35E-03	1.17E-03
	Emission in each Box of 1st jet	g/s	2.75E-04	2.14E-04	1.49E-04	1.11E-04	9.34E-05	1.37E-04	2.95E-04	7.04E-04	1.56E-03	1.38E-03	1.16E-03	1.07E-03	8.72E-04	7.85E-04	8.73E-04	9.65E-04	1.06E-03	1.23E-03	1.38E-03	1.28E-03	8.46E-04	5.91E-04	5.40E-04	4.66E-04
	Emission in each Box of 2nd jet	g/s	2.30E-04	1.79E-04	1.24E-04	9.25E-05	7.79E-05	1.14E-04	2.46E-04	5.87E-04	1.30E-03	1.15E-03	9.65E-04	8.92E-04	7.26E-04	6.54E-04	7.27E-04	8.04E-04	8.87E-04	1.03E-03	1.15E-03	1.06E-03	7.05E-04	4.92E-04	4.50E-04	3.89E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1000	0.0841	0.0878	0.0908	0.0921	0.1731	0.1791	0.1379	0.1632	0.1527	0.1379	0.1348	0.1065	0.1045	0.1067	0.1127	0.1200	0.1269	0.1336	0.1292	0.1080	0.0975	0.0952	0.0930
	NO2	g/vehicle/km	0.0177	0.0170	0.0176	0.0177	0.0178	0.0221	0.0222	0.0211	0.0309	0.0286	0.0255	0.0246	0.0218	0.0211	0.0218	0.0232	0.0248	0.0265	0.0282	0.0273	0.0221	0.0191	0.0185	0.0181
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0113***	***0.0077***	***0.0056***	***0.0042***	***0.0036***	***0.0079***	***0.0175***	***0.0341***	***0.0609***	***0.0553***	***0.0457***	***0.0427***	***0.0309***	***0.0283***	***0.0307***	***0.0341***	***0.0380***	***0.0433***	***0.0483***	***0.0449***	***0.0306***	***0.0225***	***0.0206***	***0.0179***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.52E-03	5.15E-03	3.71E-03	2.83E-03	2.39E-03	5.29E-03	1.17E-02	2.28E-02	4.06E-02	3.68E-02	3.04E-02	2.85E-02	2.06E-02	1.89E-02	2.05E-02	2.27E-02	2.53E-02	2.89E-02	3.22E-02	2.99E-02	2.04E-02	1.50E-02	1.38E-02	1.19E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.76E-03	2.58E-03	1.85E-03	1.41E-03	1.20E-03	2.64E-03	5.83E-03	1.14E-02	2.03E-02	1.84E-02	1.52E-02	1.42E-02	1.03E-02	9.43E-03	1.02E-02	1.14E-02	1.27E-02	1.44E-02	1.61E-02	1.50E-02	1.02E-02	7.51E-03	6.88E-03	5.95E-03
	Emission in each Box of 1st jet	g/s	1.50E-03	1.03E-03	7.41E-04	5.65E-04	4.79E-04	1.06E-03	2.33E-03	4.55E-03	8.11E-03	7.37E-03	6.09E-03	5.70E-03	4.11E-03	3.77E-03	4.09E-03	4.54E-03	5.07E-03	5.78E-03	6.44E-03	5.99E-03	4.09E-03	3.01E-03	2.75E-03	2.38E-03
	Emission in each Box of 2nd jet	g/s	1.25E-03	8.59E-04	6.18E-04	4.71E-04	3.99E-04	8.81E-04	1.94E-03	3.79E-03	6.76E-03	6.14E-03	5.07E-03	4.75E-03	3.43E-03	3.14E-03	3.41E-03	3.79E-03	4.22E-03	4.81E-03	5.37E-03	4.99E-03	3.41E-03	2.50E-03	2.29E-03	1.98E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0022***	***0.0052***	***0.0115***	***0.0104***	***0.0084***	***0.0078***	***0.0063***	***0.0057***	***0.0063***	***0.0070***	***0.0079***	***0.0090***	***0.0102***	***0.0095***	***0.0063***	***0.0044***	***0.0040***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.33E-03	1.04E-03	7.42E-04	5.52E-04	4.62E-04	6.77E-04	1.44E-03	3.48E-03	7.67E-03	6.91E-03	5.63E-03	5.20E-03	4.20E-03	3.81E-03	4.18E-03	4.69E-03	5.24E-03	6.02E-03	6.80E-03	6.31E-03	4.19E-03	2.94E-03	2.67E-03	2.32E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.66E-04	5.21E-04	3.71E-04	2.76E-04	2.31E-04	3.38E-04	7.22E-04	1.74E-03	3.84E-03	3.45E-03	2.81E-03	2.60E-03	2.10E-03	1.91E-03	2.09E-03	2.34E-03	2.62E-03	3.01E-03	3.40E-03	3.16E-03	2.10E-03	1.47E-03	1.34E-03	1.16E-03
	Emission in each Box of 1st jet	g/s	2.67E-04	2.08E-04	1.48E-04	1.10E-04	9.24E-05	1.35E-04	2.89E-04	6.97E-04	1.53E-03	1.38E-03	1.13E-03	1.04E-03	8.41E-04	7.62E-04	8.37E-04	9.37E-04	1.05E-03	1.20E-03	1.36E-03	1.26E-03	8.38E-04	5.88E-04	5.34E-04	4.64E-04
	Emission in each Box of 2nd jet	g/s	2.22E-04	1.74E-04	1.24E-04	9.20E-05	7.70E-05	1.13E-04	2.41E-04	5.81E-04	1.28E-03	1.15E-03	9.38E-04	8.66E-04	7.01E-04	6.35E-04	6.97E-04	7.81E-04	8.74E-04	1.00E-03	1.13E-03	1.05E-03	6.98E-04	4.90E-04	4.45E-04	3.87E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1006	0.0836	0.0851	0.0879	0.0897	0.1676	0.1791	0.1345	0.1592	0.1476	0.1386	0.1364	0.1045	0.1027	0.1080	0.1133	0.1179	0.1266	0.1322	0.1278	0.1060	0.0963	0.0940	0.0906
	NO2	g/vehicle/km	0.0178	0.0169	0.0171	0.0172	0.0174	0.0215	0.0222	0.0206	0.0301	0.0277	0.0256	0.0248	0.0214	0.0208	0.0220	0.0233	0.0244	0.0264	0.0279	0.0270	0.0218	0.0189	0.0183	0.0177
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0114***	***0.0077***	***0.0054***	***0.0041***	***0.0035***	***0.0077***	***0.0175***	***0.0333***	***0.0594***	***0.0534***	***0.0459***	***0.0432***	***0.0303***	***0.0278***	***0.0311***	***0.0342***	***0.0373***	***0.0432***	***0.0478***	***0.0444***	***0.0301***	***0.0223***	***0.0204***	***0.0174***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.57E-03	5.12E-03	3.59E-03	2.74E-03	2.33E-03	5.12E-03	1.17E-02	2.22E-02	3.96E-02	3.56E-02	3.06E-02	2.88E-02	2.02E-02	1.85E-02	2.07E-02	2.28E-02	2.49E-02	2.88E-02	3.19E-02	2.96E-02	2.01E-02	1.48E-02	1.36E-02	1.16E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.78E-03	2.56E-03	1.79E-03	1.37E-03	1.17E-03	2.56E-03	5.83E-03	1.11E-02	1.98E-02	1.78E-02	1.53E-02	1.44E-02	1.01E-02	9.27E-03	1.04E-02	1.14E-02	1.24E-02	1.44E-02	1.59E-02	1.48E-02	1.00E-02	7.42E-03	6.79E-03	5.80E-03
	Emission in each Box of 1st jet	g/s	1.51E-03	1.02E-03	7.18E-04	5.47E-04	4.66E-04	1.02E-03	2.33E-03	4.44E-03	7.92E-03	7.12E-03	6.12E-03	5.77E-03	4.04E-03	3.71E-03	4.14E-03	4.57E-03	4.98E-03	5.76E-03	6.37E-03	5.92E-03	4.01E-03	2.97E-03	2.72E-03	2.32E-03
	Emission in each Box of 2nd jet	g/s	1.26E-03	8.54E-04	5.98E-04	4.56E-04	3.88E-04	8.53E-04	1.94E-03	3.70E-03	6.60E-03	5.94E-03	5.10E-03	4.80E-03	3.36E-03	3.09E-03	3.45E-03	3.81E-03	4.15E-03	4.80E-03	5.31E-03	4.93E-03	3.34E-03	2.47E-03	2.26E-03	1.93E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0022***	***0.0051***	***0.0112***	***0.0100***	***0.0085***	***0.0079***	***0.0062***	***0.0056***	***0.0063***	***0.0071***	***0.0077***	***0.0090***	***0.0101***	***0.0094***	***0.0062***	***0.0044***	***0.0040***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.34E-03	1.04E-03	7.22E-04	5.36E-04	4.51E-04	6.57E-04	1.44E-03	3.40E-03	7.48E-03	6.69E-03	5.65E-03	5.25E-03	4.13E-03	3.75E-03	4.23E-03	4.70E-03	5.15E-03	6.00E-03	6.73E-03	6.24E-03	4.12E-03	2.91E-03	2.64E-03	2.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.70E-04	5.18E-04	3.61E-04	2.68E-04	2.26E-04	3.29E-04	7.22E-04	1.70E-03	3.74E-03	3.35E-03	2.82E-03	2.62E-03	2.07E-03	1.87E-03	2.11E-03	2.35E-03	2.57E-03	3.00E-03	3.36E-03	3.12E-03	2.06E-03	1.45E-03	1.32E-03	1.13E-03
	Emission in each Box of 1st jet	g/s	2.68E-04	2.07E-04	1.44E-04	1.07E-04	9.03E-05	1.31E-04	2.89E-04	6.80E-04	1.50E-03	1.34E-03	1.13E-03	1.05E-03	8.27E-04	7.50E-04	8.46E-04	9.41E-04	1.03E-03	1.20E-03	1.35E-03	1.25E-03	8.24E-04	5.81E-04	5.28E-04	4.53E-04
	Emission in each Box of 2nd jet	g/s	2.23E-04	1.73E-04	1.20E-04	8.94E-05	7.52E-05	1.10E-04	2.41E-04	5.67E-04	1.25E-03	1.12E-03	9.41E-04	8.74E-04	6.89E-04	6.25E-04	7.05E-04	7.84E-04	8.58E-04	9.99E-04	1.12E-03	1.04E-03	6.86E-04	4.84E-04	4.40E-04	3.78E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1020	0.0853	0.0868	0.0898	0.0916	0.1711	0.1827	0.1379	0.1611	0.1481	0.1408	0.1366	0.1065	0.1045	0.1074	0.1127	0.1208	0.1261	0.1360	0.1277	0.1062	0.0963	0.0940	0.0918
	NO2	g/vehicle/km	0.0180	0.0172	0.0174	0.0176	0.0177	0.0219	0.0226	0.0211	0.0304	0.0278	0.0260	0.0249	0.0218	0.0211	0.0220	0.0232	0.0250	0.0263	0.0287	0.0270	0.0217	0.0189	0.0183	0.0179
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0115***	***0.0078***	***0.0055***	***0.0042***	***0.0036***	***0.0078***	***0.0178***	***0.0341***	***0.0601***	***0.0536***	***0.0466***	***0.0433***	***0.0309***	***0.0283***	***0.0309***	***0.0341***	***0.0382***	***0.0430***	***0.0492***	***0.0444***	***0.0301***	***0.0223***	***0.0204***	***0.0176***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.67E-03	5.23E-03	3.66E-03	2.79E-03	2.38E-03	5.23E-03	1.19E-02	2.28E-02	4.01E-02	3.57E-02	3.11E-02	2.89E-02	2.06E-02	1.89E-02	2.06E-02	2.27E-02	2.55E-02	2.87E-02	3.28E-02	2.96E-02	2.01E-02	1.48E-02	1.36E-02	1.18E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.84E-03	2.61E-03	1.83E-03	1.40E-03	1.19E-03	2.61E-03	5.95E-03	1.14E-02	2.00E-02	1.79E-02	1.55E-02	1.44E-02	1.03E-02	9.43E-03	1.03E-02	1.14E-02	1.27E-02	1.43E-02	1.64E-02	1.48E-02	1.00E-02	7.42E-03	6.79E-03	5.88E-03
	Emission in each Box of 1st jet	g/s	1.53E-03	1.05E-03	7.33E-04	5.59E-04	4.76E-04	1.05E-03	2.38E-03	4.55E-03	8.01E-03	7.15E-03	6.22E-03	5.77E-03	4.11E-03	3.77E-03	4.12E-03	4.54E-03	5.10E-03	5.74E-03	6.55E-03	5.92E-03	4.02E-03	2.97E-03	2.72E-03	2.35E-03
	Emission in each Box of 2nd jet	g/s	1.28E-03	8.71E-04	6.11E-04	4.66E-04	3.97E-04	8.71E-04	1.98E-03	3.79E-03	6.68E-03	5.96E-03	5.18E-03	4.81E-03	3.43E-03	3.14E-03	3.43E-03	3.79E-03	4.25E-03	4.78E-03	5.46E-03	4.93E-03	3.35E-03	2.47E-03	2.26E-03	1.96E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0022***	***0.0052***	***0.0114***	***0.0101***	***0.0086***	***0.0079***	***0.0063***	***0.0057***	***0.0063***	***0.0070***	***0.0079***	***0.0090***	***0.0104***	***0.0094***	***0.0062***	***0.0044***	***0.0040***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.36E-03	1.06E-03	7.35E-04	5.47E-04	4.60E-04	6.70E-04	1.47E-03	3.48E-03	7.57E-03	6.72E-03	5.73E-03	5.26E-03	4.20E-03	3.81E-03	4.21E-03	4.69E-03	5.27E-03	5.99E-03	6.91E-03	6.24E-03	4.11E-03	2.91E-03	2.64E-03	2.29E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.78E-04	5.28E-04	3.67E-04	2.73E-04	2.30E-04	3.35E-04	7.36E-04	1.74E-03	3.78E-03	3.36E-03	2.87E-03	2.63E-03	2.10E-03	1.91E-03	2.11E-03	2.34E-03	2.64E-03	2.99E-03	3.46E-03	3.12E-03	2.05E-03	1.45E-03	1.32E-03	1.15E-03
	Emission in each Box of 1st jet	g/s	2.71E-04	2.11E-04	1.47E-04	1.09E-04	9.20E-05	1.34E-04	2.94E-04	6.97E-04	1.51E-03	1.34E-03	1.15E-03	1.05E-03	8.41E-04	7.62E-04	8.42E-04	9.37E-04	1.05E-03	1.20E-03	1.38E-03	1.25E-03	8.22E-04	5.82E-04	5.28E-04	4.59E-04
	Emission in each Box of 2nd jet	g/s	2.26E-04	1.76E-04	1.22E-04	9.11E-05	7.67E-05	1.12E-04	2.45E-04	5.81E-04	1.26E-03	1.12E-03	9.55E-04	8.77E-04	7.01E-04	6.35E-04	7.02E-04	7.81E-04	8.79E-04	9.98E-04	1.15E-03	1.04E-03	6.85E-04	4.85E-04	4.40E-04	3.82E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1013	0.0847	0.0861	0.0885	0.0932	0.1740	0.1847	0.1362	0.1625	0.1498	0.1426	0.1365	0.1079	0.1074	0.1096	0.1158	0.1196	0.1257	0.1353	0.1261	0.1093	0.0987	0.0963	0.0941
	NO2	g/vehicle/km	0.0179	0.0171	0.0173	0.0173	0.0180	0.0223	0.0228	0.0209	0.0307	0.0281	0.0262	0.0248	0.0220	0.0216	0.0223	0.0238	0.0247	0.0262	0.0286	0.0266	0.0224	0.0193	0.0187	0.0183
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0114***	***0.0078***	***0.0055***	***0.0041***	***0.0036***	***0.0080***	***0.0180***	***0.0337***	***0.0606***	***0.0542***	***0.0472***	***0.0433***	***0.0313***	***0.0291***	***0.0315***	***0.0350***	***0.0379***	***0.0429***	***0.0489***	***0.0438***	***0.0310***	***0.0228***	***0.0209***	***0.0181***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.62E-03	5.19E-03	3.63E-03	2.75E-03	2.42E-03	5.32E-03	1.20E-02	2.25E-02	4.04E-02	3.62E-02	3.15E-02	2.88E-02	2.08E-02	1.94E-02	2.10E-02	2.33E-02	2.52E-02	2.86E-02	3.26E-02	2.92E-02	2.07E-02	1.52E-02	1.39E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.81E-03	2.59E-03	1.82E-03	1.38E-03	1.21E-03	2.66E-03	6.01E-03	1.12E-02	2.02E-02	1.81E-02	1.57E-02	1.44E-02	1.04E-02	9.69E-03	1.05E-02	1.17E-02	1.26E-02	1.43E-02	1.63E-02	1.46E-02	1.03E-02	7.61E-03	6.96E-03	6.03E-03
	Emission in each Box of 1st jet	g/s	1.52E-03	1.04E-03	7.27E-04	5.51E-04	4.84E-04	1.06E-03	2.41E-03	4.49E-03	8.08E-03	7.23E-03	6.30E-03	5.77E-03	4.17E-03	3.88E-03	4.20E-03	4.67E-03	5.05E-03	5.72E-03	6.52E-03	5.84E-03	4.14E-03	3.04E-03	2.78E-03	2.41E-03
	Emission in each Box of 2nd jet	g/s	1.27E-03	8.64E-04	6.06E-04	4.59E-04	4.04E-04	8.86E-04	2.00E-03	3.74E-03	6.73E-03	6.03E-03	5.25E-03	4.81E-03	3.47E-03	3.23E-03	3.50E-03	3.89E-03	4.21E-03	4.77E-03	5.43E-03	4.87E-03	3.45E-03	2.54E-03	2.32E-03	2.01E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0022***	***0.0052***	***0.0115***	***0.0102***	***0.0087***	***0.0079***	***0.0064***	***0.0059***	***0.0064***	***0.0072***	***0.0078***	***0.0089***	***0.0103***	***0.0093***	***0.0063***	***0.0045***	***0.0041***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.35E-03	1.05E-03	7.29E-04	5.39E-04	4.67E-04	6.80E-04	1.49E-03	3.44E-03	7.64E-03	6.78E-03	5.79E-03	5.25E-03	4.25E-03	3.90E-03	4.28E-03	4.79E-03	5.21E-03	5.96E-03	6.88E-03	6.17E-03	4.23E-03	2.97E-03	2.70E-03	2.34E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.74E-04	5.24E-04	3.65E-04	2.70E-04	2.34E-04	3.40E-04	7.43E-04	1.72E-03	3.82E-03	3.39E-03	2.90E-03	2.62E-03	2.12E-03	1.95E-03	2.14E-03	2.40E-03	2.61E-03	2.98E-03	3.44E-03	3.09E-03	2.12E-03	1.49E-03	1.35E-03	1.17E-03
	Emission in each Box of 1st jet	g/s	2.69E-04	2.10E-04	1.46E-04	1.08E-04	9.34E-05	1.36E-04	2.97E-04	6.88E-04	1.53E-03	1.36E-03	1.16E-03	1.05E-03	8.50E-04	7.80E-04	8.57E-04	9.59E-04	1.04E-03	1.19E-03	1.38E-03	1.23E-03	8.46E-04	5.94E-04	5.40E-04	4.69E-04
	Emission in each Box of 2nd jet	g/s	2.25E-04	1.75E-04	1.22E-04	8.99E-05	7.79E-05	1.13E-04	2.48E-04	5.73E-04	1.27E-03	1.13E-03	9.65E-04	8.74E-04	7.08E-04	6.50E-04	7.14E-04	7.99E-04	8.69E-04	9.93E-04	1.15E-03	1.03E-03	7.05E-04	4.95E-04	4.50E-04	3.91E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1145	0.0966	0.0979	0.1014	0.1030	0.1925	0.2052	0.1567	0.1845	0.1700	0.1556	0.1525	0.1212	0.1181	0.1214	0.1276	0.1336	0.1401	0.1519	0.1437	0.1210	0.1099	0.1074	0.1044
	NO2	g/vehicle/km	0.0201	0.0193	0.0194	0.0196	0.0196	0.0245	0.0252	0.0238	0.0346	0.0317	0.0285	0.0276	0.0245	0.0236	0.0245	0.0261	0.0274	0.0290	0.0318	0.0301	0.0245	0.0213	0.0207	0.0202
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0129***	***0.0089***	***0.0062***	***0.0047***	***0.0040***	***0.0088***	***0.0200***	***0.0388***	***0.0688***	***0.0615***	***0.0515***	***0.0483***	***0.0351***	***0.0320***	***0.0349***	***0.0386***	***0.0423***	***0.0478***	***0.0549***	***0.0499***	***0.0343***	***0.0254***	***0.0233***	***0.0201***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.61E-03	5.92E-03	4.13E-03	3.16E-03	2.68E-03	5.88E-03	1.34E-02	2.59E-02	4.59E-02	4.10E-02	3.43E-02	3.22E-02	2.34E-02	2.13E-02	2.33E-02	2.57E-02	2.82E-02	3.19E-02	3.66E-02	3.33E-02	2.29E-02	1.69E-02	1.55E-02	1.34E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.31E-03	2.96E-03	2.07E-03	1.58E-03	1.34E-03	2.94E-03	6.68E-03	1.29E-02	2.29E-02	2.05E-02	1.72E-02	1.61E-02	1.17E-02	1.07E-02	1.16E-02	1.29E-02	1.41E-02	1.59E-02	1.83E-02	1.66E-02	1.14E-02	8.47E-03	7.76E-03	6.69E-03
	Emission in each Box of 1st jet	g/s	1.72E-03	1.18E-03	8.26E-04	6.31E-04	5.36E-04	1.18E-03	2.67E-03	5.17E-03	9.18E-03	8.21E-03	6.87E-03	6.44E-03	4.68E-03	4.27E-03	4.66E-03	5.14E-03	5.64E-03	6.37E-03	7.32E-03	6.65E-03	4.58E-03	3.39E-03	3.10E-03	2.67E-03
	Emission in each Box of 2nd jet	g/s	1.44E-03	9.86E-04	6.88E-04	5.26E-04	4.46E-04	9.80E-04	2.23E-03	4.31E-03	7.65E-03	6.84E-03	5.72E-03	5.37E-03	3.90E-03	3.55E-03	3.88E-03	4.29E-03	4.70E-03	5.31E-03	6.10E-03	5.54E-03	3.82E-03	2.82E-03	2.59E-03	2.23E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0025***	***0.0059***	***0.0129***	***0.0115***	***0.0094***	***0.0087***	***0.0071***	***0.0064***	***0.0071***	***0.0079***	***0.0087***	***0.0099***	***0.0115***	***0.0104***	***0.0070***	***0.0049***	***0.0045***	***0.0039***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.51E-03	1.18E-03	8.19E-04	6.10E-04	5.10E-04	7.48E-04	1.64E-03	3.93E-03	8.61E-03	7.64E-03	6.30E-03	5.83E-03	4.73E-03	4.26E-03	4.71E-03	5.26E-03	5.79E-03	6.60E-03	7.66E-03	6.97E-03	4.64E-03	3.28E-03	2.99E-03	2.58E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.56E-04	5.91E-04	4.10E-04	3.05E-04	2.55E-04	3.74E-04	8.21E-04	1.96E-03	4.30E-03	3.82E-03	3.15E-03	2.91E-03	2.36E-03	2.13E-03	2.35E-03	2.63E-03	2.90E-03	3.30E-03	3.83E-03	3.48E-03	2.32E-03	1.64E-03	1.49E-03	1.29E-03
	Emission in each Box of 1st jet	g/s	3.02E-04	2.36E-04	1.64E-04	1.22E-04	1.02E-04	1.50E-04	3.28E-04	7.85E-04	1.72E-03	1.53E-03	1.26E-03	1.17E-03	9.46E-04	8.53E-04	9.42E-04	1.05E-03	1.16E-03	1.32E-03	1.53E-03	1.39E-03	9.27E-04	6.56E-04	5.97E-04	5.17E-04
	Emission in each Box of 2nd jet	g/s	2.52E-04	1.97E-04	1.37E-04	1.02E-04	8.50E-05	1.25E-04	2.74E-04	6.54E-04	1.43E-03	1.27E-03	1.05E-03	9.71E-04	7.88E-04	7.10E-04	7.85E-04	8.76E-04	9.65E-04	1.10E-03	1.28E-03	1.16E-03	7.73E-04	5.47E-04	4.98E-04	4.30E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1259	0.1077	0.1095	0.1145	0.1167	0.2175	0.2313	0.1764	0.2083	0.1925	0.1761	0.1716	0.1346	0.1313	0.1348	0.1418	0.1476	0.1576	0.1675	0.1609	0.1348	0.1224	0.1198	0.1171
	NO2	g/vehicle/km	0.0219	0.0212	0.0214	0.0218	0.0219	0.0274	0.0282	0.0266	0.0387	0.0355	0.0320	0.0308	0.0270	0.0260	0.0271	0.0288	0.0301	0.0324	0.0348	0.0334	0.0271	0.0235	0.0228	0.0224
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0142***	***0.0099***	***0.0069***	***0.0053***	***0.0046***	***0.0100***	***0.0226***	***0.0436***	***0.0777***	***0.0697***	***0.0583***	***0.0544***	***0.0390***	***0.0355***	***0.0388***	***0.0429***	***0.0467***	***0.0538***	***0.0605***	***0.0559***	***0.0382***	***0.0283***	***0.0260***	***0.0225***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.47E-03	6.60E-03	4.62E-03	3.56E-03	3.03E-03	6.65E-03	1.51E-02	2.91E-02	5.18E-02	4.65E-02	3.89E-02	3.63E-02	2.60E-02	2.37E-02	2.59E-02	2.86E-02	3.12E-02	3.59E-02	4.03E-02	3.73E-02	2.55E-02	1.89E-02	1.73E-02	1.50E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.74E-03	3.30E-03	2.31E-03	1.78E-03	1.52E-03	3.32E-03	7.53E-03	1.45E-02	2.59E-02	2.32E-02	1.94E-02	1.81E-02	1.30E-02	1.18E-02	1.29E-02	1.43E-02	1.56E-02	1.79E-02	2.02E-02	1.86E-02	1.27E-02	9.43E-03	8.66E-03	7.50E-03
	Emission in each Box of 1st jet	g/s	1.89E-03	1.32E-03	9.24E-04	7.13E-04	6.07E-04	1.33E-03	3.01E-03	5.82E-03	1.04E-02	9.29E-03	7.78E-03	7.25E-03	5.20E-03	4.74E-03	5.17E-03	5.72E-03	6.23E-03	7.17E-03	8.07E-03	7.45E-03	5.10E-03	3.77E-03	3.46E-03	3.00E-03
	Emission in each Box of 2nd jet	g/s	1.58E-03	1.10E-03	7.70E-04	5.94E-04	5.06E-04	1.11E-03	2.51E-03	4.85E-03	8.63E-03	7.74E-03	6.48E-03	6.04E-03	4.33E-03	3.95E-03	4.31E-03	4.77E-03	5.19E-03	5.98E-03	6.72E-03	6.21E-03	4.25E-03	3.14E-03	2.89E-03	2.50E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0019***	***0.0014***	***0.0010***	***0.0009***	***0.0013***	***0.0027***	***0.0066***	***0.0144***	***0.0129***	***0.0106***	***0.0098***	***0.0078***	***0.0070***	***0.0078***	***0.0087***	***0.0095***	***0.0110***	***0.0126***	***0.0116***	***0.0077***	***0.0054***	***0.0050***	***0.0043***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.64E-03	1.30E-03	9.01E-04	6.78E-04	5.70E-04	8.36E-04	1.83E-03	4.38E-03	9.63E-03	8.58E-03	7.07E-03	6.51E-03	5.21E-03	4.70E-03	5.19E-03	5.80E-03	6.36E-03	7.36E-03	8.39E-03	7.73E-03	5.12E-03	3.62E-03	3.30E-03	2.87E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.22E-04	6.49E-04	4.51E-04	3.39E-04	2.85E-04	4.18E-04	9.16E-04	2.19E-03	4.81E-03	4.29E-03	3.54E-03	3.25E-03	2.61E-03	2.35E-03	2.60E-03	2.90E-03	3.18E-03	3.68E-03	4.19E-03	3.86E-03	2.56E-03	1.81E-03	1.65E-03	1.43E-03
	Emission in each Box of 1st jet	g/s	3.29E-04	2.60E-04	1.80E-04	1.36E-04	1.14E-04	1.67E-04	3.67E-04	8.76E-04	1.93E-03	1.72E-03	1.41E-03	1.30E-03	1.04E-03	9.40E-04	1.04E-03	1.16E-03	1.27E-03	1.47E-03	1.68E-03	1.55E-03	1.02E-03	7.25E-04	6.60E-04	5.74E-04
	Emission in each Box of 2nd jet	g/s	2.74E-04	2.16E-04	1.50E-04	1.13E-04	9.50E-05	1.39E-04	3.05E-04	7.30E-04	1.60E-03	1.43E-03	1.18E-03	1.08E-03	8.69E-04	7.83E-04	8.65E-04	9.67E-04	1.06E-03	1.23E-03	1.40E-03	1.29E-03	8.54E-04	6.04E-04	5.50E-04	4.78E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1467	1195	823	607	507	596	1270	3218	4850	4707	4306	4122	3769	3521	3742	3932	4118	4438	4699	4517	3690	3006	2820	2498
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1332	0.1131	0.1149	0.1195	0.1234	0.2281	0.2418	0.1844	0.2175	0.2008	0.1831	0.1787	0.1399	0.1364	0.1406	0.1476	0.1535	0.1635	0.1756	0.1664	0.1401	0.1270	0.1260	0.1232
	NO2	g/vehicle/km	0.0230	0.0221	0.0223	0.0226	0.0230	0.0286	0.0293	0.0276	0.0402	0.0369	0.0331	0.0319	0.0280	0.0270	0.0281	0.0298	0.0312	0.0334	0.0363	0.0344	0.0280	0.0242	0.0238	0.0233
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0150***	***0.0104***	***0.0073***	***0.0056***	***0.0048***	***0.0105***	***0.0236***	***0.0456***	***0.0811***	***0.0727***	***0.0606***	***0.0567***	***0.0405***	***0.0369***	***0.0404***	***0.0446***	***0.0486***	***0.0558***	***0.0634***	***0.0578***	***0.0397***	***0.0294***	***0.0273***	***0.0237***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.00E-02	6.93E-03	4.85E-03	3.72E-03	3.21E-03	6.97E-03	1.57E-02	3.04E-02	5.41E-02	4.85E-02	4.04E-02	3.78E-02	2.70E-02	2.46E-02	2.70E-02	2.97E-02	3.24E-02	3.72E-02	4.23E-02	3.85E-02	2.65E-02	1.96E-02	1.82E-02	1.58E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.01E-03	3.46E-03	2.42E-03	1.86E-03	1.60E-03	3.49E-03	7.87E-03	1.52E-02	2.70E-02	2.42E-02	2.02E-02	1.89E-02	1.35E-02	1.23E-02	1.35E-02	1.49E-02	1.62E-02	1.86E-02	2.11E-02	1.93E-02	1.32E-02	9.79E-03	9.11E-03	7.89E-03
	Emission in each Box of 1st jet	g/s	2.00E-03	1.39E-03	9.70E-04	7.44E-04	6.42E-04	1.39E-03	3.15E-03	6.08E-03	1.08E-02	9.69E-03	8.08E-03	7.55E-03	5.40E-03	4.92E-03	5.39E-03	5.95E-03	6.48E-03	7.44E-03	8.46E-03	7.71E-03	5.30E-03	3.91E-03	3.64E-03	3.16E-03
	Emission in each Box of 2nd jet	g/s	1.67E-03	1.15E-03	8.08E-04	6.20E-04	5.35E-04	1.16E-03	2.62E-03	5.07E-03	9.01E-03	8.08E-03	6.74E-03	6.29E-03	4.50E-03	4.10E-03	4.49E-03	4.96E-03	5.40E-03	6.20E-03	7.05E-03	6.42E-03	4.42E-03	3.26E-03	3.04E-03	2.63E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0011***	***0.0009***	***0.0013***	***0.0029***	***0.0068***	***0.0150***	***0.0133***	***0.0110***	***0.0101***	***0.0081***	***0.0073***	***0.0081***	***0.0090***	***0.0099***	***0.0114***	***0.0131***	***0.0119***	***0.0079***	***0.0056***	***0.0052***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.73E-03	1.35E-03	9.40E-04	7.03E-04	5.97E-04	8.73E-04	1.91E-03	4.55E-03	1.00E-02	8.90E-03	7.32E-03	6.75E-03	5.41E-03	4.87E-03	5.40E-03	6.01E-03	6.58E-03	7.60E-03	8.74E-03	7.97E-03	5.30E-03	3.73E-03	3.44E-03	2.99E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.63E-04	6.76E-04	4.70E-04	3.51E-04	2.98E-04	4.36E-04	9.53E-04	2.28E-03	5.00E-03	4.45E-03	3.66E-03	3.37E-03	2.71E-03	2.44E-03	2.70E-03	3.01E-03	3.29E-03	3.80E-03	4.37E-03	3.98E-03	2.65E-03	1.87E-03	1.72E-03	1.49E-03
	Emission in each Box of 1st jet	g/s	3.45E-04	2.71E-04	1.88E-04	1.41E-04	1.19E-04	1.75E-04	3.81E-04	9.11E-04	2.00E-03	1.78E-03	1.46E-03	1.35E-03	1.08E-03	9.75E-04	1.08E-03	1.20E-03	1.32E-03	1.52E-03	1.75E-03	1.59E-03	1.06E-03	7.47E-04	6.88E-04	5.97E-04
	Emission in each Box of 2nd jet	g/s	2.88E-04	2.25E-04	1.57E-04	1.17E-04	9.95E-05	1.45E-04	3.18E-04	7.59E-04	1.67E-03	1.48E-03	1.22E-03	1.12E-03	9.02E-04	8.12E-04	9.00E-04	1.00E-03	1.10E-03	1.27E-03	1.46E-03	1.33E-03	8.83E-04	6.22E-04	5.73E-04	4.98E-04
RSP Emission Rate		g/s	***1.02E-03***	***6.99E-04***	***4.93E-04***	***3.78E-04***	***3.23E-04***	***7.20E-04***	***1.63E-03***	***3.01E-03***	***4.58E-03***	***4.21E-03***	***3.67E-03***	***3.46E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.72E-03***	***2.92E-03***	***3.26E-03***	***3.62E-03***	***3.34E-03***	***2.46E-03***	***1.96E-03***	***1.84E-03***	***1.59E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.83E-04	4.66E-04	3.29E-04	2.52E-04	2.15E-04	4.80E-04	1.08E-03	2.01E-03	3.05E-03	2.81E-03	2.44E-03	2.31E-03	1.68E-03	1.57E-03	1.67E-03	1.81E-03	1.95E-03	2.18E-03	2.41E-03	2.22E-03	1.64E-03	1.31E-03	1.22E-03	1.06E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.42E-04	2.33E-04	1.64E-04	1.26E-04	1.08E-04	2.40E-04	5.42E-04	1.00E-03	1.53E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	9.07E-04	9.73E-04	1.09E-03	1.21E-03	1.11E-03	8.22E-04	6.54E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	9.33E-05	6.57E-05	5.04E-05	4.31E-05	9.60E-05	2.17E-04	4.02E-04	6.11E-04	5.61E-04	4.89E-04	4.61E-04	3.36E-04	3.13E-04	3.34E-04	3.63E-04	3.89E-04	4.35E-04	4.82E-04	4.45E-04	3.29E-04	2.62E-04	2.45E-04	2.11E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.77E-05	5.48E-05	4.20E-05	3.59E-05	8.00E-05	1.81E-04	3.35E-04	5.09E-04	4.68E-04	4.07E-04	3.84E-04	2.80E-04	2.61E-04	2.79E-04	3.02E-04	3.24E-04	3.63E-04	4.02E-04	3.71E-04	2.74E-04	2.18E-04	2.04E-04	1.76E-04
FSP Emission Rate		g/s	***9.44E-04***	***6.44E-04***	***4.54E-04***	***3.48E-04***	***2.95E-04***	***6.62E-04***	***1.50E-03***	***2.77E-03***	***4.22E-03***	***3.87E-03***	***3.37E-03***	***3.17E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.68E-03***	***3.01E-03***	***3.33E-03***	***3.06E-03***	***2.27E-03***	***1.81E-03***	***1.68E-03***	***1.46E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.29E-04	4.29E-04	3.03E-04	2.32E-04	1.97E-04	4.42E-04	9.98E-04	1.85E-03	2.81E-03	2.58E-03	2.24E-03	2.12E-03	1.55E-03	1.43E-03	1.54E-03	1.66E-03	1.78E-03	2.01E-03	2.22E-03	2.04E-03	1.52E-03	1.21E-03	1.12E-03	9.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.15E-04	2.15E-04	1.51E-04	1.16E-04	9.85E-05	2.21E-04	4.99E-04	9.24E-04	1.41E-03	1.29E-03	1.12E-03	1.06E-03	7.74E-04	7.17E-04	7.71E-04	8.31E-04	8.92E-04	1.00E-03	1.11E-03	1.02E-03	7.58E-04	6.03E-04	5.60E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.58E-05	6.05E-05	4.64E-05	3.94E-05	8.83E-05	2.00E-04	3.70E-04	5.63E-04	5.16E-04	4.49E-04	4.23E-04	3.10E-04	2.87E-04	3.08E-04	3.32E-04	3.57E-04	4.02E-04	4.44E-04	4.08E-04	3.03E-04	2.41E-04	2.24E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	7.15E-05	5.05E-05	3.87E-05	3.28E-05	7.36E-05	1.66E-04	3.08E-04	4.69E-04	4.30E-04	3.74E-04	3.53E-04	2.58E-04	2.39E-04	2.57E-04	2.77E-04	2.97E-04	3.35E-04	3.70E-04	3.40E-04	2.53E-04	2.01E-04	1.87E-04	1.62E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1405	0.1200	0.1223	0.1272	0.1298	0.2391	0.2553	0.1934	0.2292	0.2119	0.1952	0.1888	0.1496	0.1453	0.1479	0.1571	0.1637	0.1734	0.1850	0.1755	0.1478	0.1341	0.1330	0.1298
	NO2	g/vehicle/km	0.0240	0.0232	0.0234	0.0237	0.0239	0.0298	0.0307	0.0288	0.0421	0.0387	0.0351	0.0335	0.0297	0.0285	0.0294	0.0315	0.0330	0.0351	0.0380	0.0360	0.0293	0.0254	0.0249	0.0244
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0021***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0015***	***0.0035***	***0.0064***	***0.0113***	***0.0101***	***0.0085***	***0.0079***	***0.0073***	***0.0066***	***0.0071***	***0.0080***	***0.0087***	***0.0099***	***0.0112***	***0.0102***	***0.0070***	***0.0052***	***0.0049***	***0.0042***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.39E-03	9.62E-04	6.75E-04	5.22E-04	4.43E-04	1.01E-03	2.32E-03	4.27E-03	7.52E-03	6.75E-03	5.69E-03	5.28E-03	4.85E-03	4.41E-03	4.76E-03	5.32E-03	5.79E-03	6.62E-03	7.47E-03	6.81E-03	4.70E-03	3.48E-03	3.24E-03	2.79E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.96E-04	4.81E-04	3.38E-04	2.61E-04	2.22E-04	5.07E-04	1.16E-03	2.13E-03	3.76E-03	3.37E-03	2.85E-03	2.64E-03	2.42E-03	2.21E-03	2.38E-03	2.66E-03	2.90E-03	3.31E-03	3.73E-03	3.41E-03	2.35E-03	1.74E-03	1.62E-03	1.39E-03
	Emission in each Box of 1st jet	g/s	1.74E-04	1.20E-04	8.44E-05	6.53E-05	5.54E-05	1.27E-04	2.90E-04	5.33E-04	9.40E-04	8.43E-04	7.12E-04	6.59E-04	6.06E-04	5.51E-04	5.95E-04	6.64E-04	7.24E-04	8.27E-04	9.34E-04	8.52E-04	5.87E-04	4.35E-04	4.04E-04	3.48E-04
	Emission in each Box of 2nd jet	g/s	9.95E-05	6.87E-05	4.82E-05	3.73E-05	3.17E-05	7.24E-05	1.66E-04	3.05E-04	5.37E-04	4.82E-04	4.07E-04	3.77E-04	3.46E-04	3.15E-04	3.40E-04	3.80E-04	4.14E-04	4.73E-04	5.33E-04	4.87E-04	3.35E-04	2.49E-04	2.31E-04	1.99E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0021***	***0.0018***	***0.0015***	***0.0014***	***0.0014***	***0.0013***	***0.0014***	***0.0016***	***0.0017***	***0.0020***	***0.0023***	***0.0021***	***0.0014***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.38E-04	1.86E-04	1.29E-04	9.75E-05	8.18E-05	1.26E-04	2.79E-04	6.35E-04	1.38E-03	1.23E-03	1.02E-03	9.37E-04	9.63E-04	8.64E-04	9.47E-04	1.07E-03	1.17E-03	1.34E-03	1.53E-03	1.40E-03	9.31E-04	6.58E-04	6.06E-04	5.24E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.19E-04	9.28E-05	6.46E-05	4.87E-05	4.09E-05	6.32E-05	1.40E-04	3.18E-04	6.90E-04	6.15E-04	5.11E-04	4.69E-04	4.81E-04	4.32E-04	4.73E-04	5.33E-04	5.83E-04	6.71E-04	7.66E-04	6.98E-04	4.66E-04	3.29E-04	3.03E-04	2.62E-04
	Emission in each Box of 1st jet	g/s	2.98E-05	2.32E-05	1.62E-05	1.22E-05	1.02E-05	1.58E-05	3.49E-05	7.94E-05	1.73E-04	1.54E-04	1.28E-04	1.17E-04	1.20E-04	1.08E-04	1.18E-04	1.33E-04	1.46E-04	1.68E-04	1.92E-04	1.75E-04	1.16E-04	8.23E-05	7.57E-05	6.55E-05
	Emission in each Box of 2nd jet	g/s	1.70E-05	1.33E-05	9.24E-06	6.96E-06	5.84E-06	9.03E-06	2.00E-05	4.54E-05	9.86E-05	8.79E-05	7.30E-05	6.69E-05	6.88E-05	6.17E-05	6.76E-05	7.62E-05	8.33E-05	9.58E-05	1.09E-04	9.98E-05	6.65E-05	4.70E-05	4.33E-05	3.74E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1310	0.1106	0.1125	0.1184	0.1207	0.2233	0.2362	0.1805	0.2119	0.1933	0.1794	0.1736	0.1374	0.1345	0.1380	0.1453	0.1511	0.1609	0.1715	0.1640	0.1379	0.1254	0.1228	0.1197
	NO2	g/vehicle/km	0.0226	0.0217	0.0219	0.0223	0.0225	0.0280	0.0287	0.0271	0.0392	0.0357	0.0325	0.0311	0.0275	0.0266	0.0277	0.0294	0.0308	0.0330	0.0356	0.0339	0.0276	0.0240	0.0233	0.0228
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0019***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0014***	***0.0032***	***0.0060***	***0.0104***	***0.0092***	***0.0078***	***0.0073***	***0.0067***	***0.0061***	***0.0067***	***0.0074***	***0.0080***	***0.0092***	***0.0104***	***0.0095***	***0.0066***	***0.0049***	***0.0045***	***0.0039***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.30E-03	8.86E-04	6.21E-04	4.86E-04	4.12E-04	9.47E-04	2.15E-03	3.98E-03	6.95E-03	6.15E-03	5.23E-03	4.85E-03	4.45E-03	4.08E-03	4.44E-03	4.92E-03	5.35E-03	6.14E-03	6.92E-03	6.37E-03	4.38E-03	3.25E-03	2.99E-03	2.57E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.49E-04	4.43E-04	3.10E-04	2.43E-04	2.06E-04	4.74E-04	1.07E-03	1.99E-03	3.48E-03	3.08E-03	2.62E-03	2.42E-03	2.23E-03	2.04E-03	2.22E-03	2.46E-03	2.67E-03	3.07E-03	3.46E-03	3.18E-03	2.19E-03	1.63E-03	1.49E-03	1.29E-03
	Emission in each Box of 1st jet	g/s	1.62E-04	1.11E-04	7.76E-05	6.08E-05	5.16E-05	1.18E-04	2.68E-04	4.98E-04	8.69E-04	7.69E-04	6.54E-04	6.06E-04	5.57E-04	5.10E-04	5.56E-04	6.15E-04	6.68E-04	7.68E-04	8.65E-04	7.96E-04	5.48E-04	4.07E-04	3.73E-04	3.21E-04
	Emission in each Box of 2nd jet	g/s	9.27E-05	6.33E-05	4.43E-05	3.47E-05	2.95E-05	6.77E-05	1.53E-04	2.85E-04	4.97E-04	4.39E-04	3.74E-04	3.46E-04	3.18E-04	2.91E-04	3.17E-04	3.51E-04	3.82E-04	4.39E-04	4.94E-04	4.55E-04	3.13E-04	2.32E-04	2.13E-04	1.84E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0019***	***0.0017***	***0.0014***	***0.0013***	***0.0013***	***0.0012***	***0.0013***	***0.0015***	***0.0016***	***0.0019***	***0.0022***	***0.0020***	***0.0013***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.24E-04	1.74E-04	1.21E-04	9.18E-05	7.69E-05	1.19E-04	2.61E-04	5.97E-04	1.29E-03	1.14E-03	9.49E-04	8.69E-04	8.91E-04	8.07E-04	8.92E-04	9.95E-04	1.09E-03	1.26E-03	1.44E-03	1.32E-03	8.77E-04	6.21E-04	5.66E-04	4.89E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.12E-04	8.68E-05	6.03E-05	4.59E-05	3.85E-05	5.94E-05	1.30E-04	2.99E-04	6.44E-04	5.68E-04	4.75E-04	4.35E-04	4.46E-04	4.04E-04	4.46E-04	4.97E-04	5.44E-04	6.29E-04	7.18E-04	6.58E-04	4.39E-04	3.11E-04	2.83E-04	2.44E-04
	Emission in each Box of 1st jet	g/s	2.80E-05	2.17E-05	1.51E-05	1.15E-05	9.62E-06	1.48E-05	3.26E-05	7.46E-05	1.61E-04	1.42E-04	1.19E-04	1.09E-04	1.11E-04	1.01E-04	1.12E-04	1.24E-04	1.36E-04	1.57E-04	1.80E-04	1.65E-04	1.10E-04	7.77E-05	7.07E-05	6.11E-05
	Emission in each Box of 2nd jet	g/s	1.60E-05	1.24E-05	8.62E-06	6.56E-06	5.50E-06	8.48E-06	1.86E-05	4.27E-05	9.20E-05	8.12E-05	6.78E-05	6.21E-05	6.37E-05	5.77E-05	6.37E-05	7.11E-05	7.78E-05	8.99E-05	1.03E-04	9.41E-05	6.27E-05	4.44E-05	4.04E-05	3.49E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1233	0.1043	0.1062	0.1101	0.1122	0.2089	0.2215	0.1694	0.1995	0.1838	0.1685	0.1654	0.1308	0.1260	0.1294	0.1380	0.1419	0.1519	0.1630	0.1544	0.1293	0.1175	0.1150	0.1124
	NO2	g/vehicle/km	0.0214	0.0206	0.0208	0.0210	0.0212	0.0264	0.0270	0.0256	0.0372	0.0341	0.0308	0.0297	0.0263	0.0251	0.0261	0.0280	0.0290	0.0313	0.0340	0.0322	0.0261	0.0226	0.0219	0.0215
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0018***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0030***	***0.0056***	***0.0098***	***0.0088***	***0.0074***	***0.0069***	***0.0064***	***0.0057***	***0.0063***	***0.0070***	***0.0075***	***0.0087***	***0.0099***	***0.0090***	***0.0062***	***0.0046***	***0.0042***	***0.0036***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.22E-03	8.35E-04	5.86E-04	4.52E-04	3.84E-04	8.86E-04	2.01E-03	3.74E-03	6.55E-03	5.85E-03	4.92E-03	4.62E-03	4.24E-03	3.82E-03	4.17E-03	4.67E-03	5.02E-03	5.80E-03	6.58E-03	5.99E-03	4.11E-03	3.05E-03	2.80E-03	2.41E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.11E-04	4.18E-04	2.93E-04	2.26E-04	1.92E-04	4.43E-04	1.01E-03	1.87E-03	3.27E-03	2.93E-03	2.46E-03	2.31E-03	2.12E-03	1.91E-03	2.08E-03	2.33E-03	2.51E-03	2.90E-03	3.29E-03	3.00E-03	2.05E-03	1.52E-03	1.40E-03	1.21E-03
	Emission in each Box of 1st jet	g/s	1.53E-04	1.04E-04	7.33E-05	5.65E-05	4.79E-05	1.11E-04	2.52E-04	4.67E-04	8.19E-04	7.31E-04	6.14E-04	5.78E-04	5.30E-04	4.78E-04	5.21E-04	5.83E-04	6.28E-04	7.25E-04	8.23E-04	7.49E-04	5.13E-04	3.81E-04	3.50E-04	3.02E-04
	Emission in each Box of 2nd jet	g/s	8.73E-05	5.97E-05	4.19E-05	3.23E-05	2.74E-05	6.33E-05	1.44E-04	2.67E-04	4.68E-04	4.18E-04	3.51E-04	3.30E-04	3.03E-04	2.73E-04	2.98E-04	3.33E-04	3.59E-04	4.14E-04	4.70E-04	4.28E-04	2.93E-04	2.18E-04	2.00E-04	1.72E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0018***	***0.0016***	***0.0013***	***0.0012***	***0.0013***	***0.0011***	***0.0013***	***0.0014***	***0.0015***	***0.0018***	***0.0021***	***0.0019***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.13E-04	1.65E-04	1.15E-04	8.64E-05	7.24E-05	1.12E-04	2.46E-04	5.65E-04	1.22E-03	1.08E-03	8.97E-04	8.31E-04	8.53E-04	7.61E-04	8.40E-04	9.48E-04	1.03E-03	1.19E-03	1.37E-03	1.25E-03	8.28E-04	5.86E-04	5.34E-04	4.62E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.06E-04	8.24E-05	5.74E-05	4.32E-05	3.62E-05	5.59E-05	1.23E-04	2.82E-04	6.10E-04	5.42E-04	4.49E-04	4.15E-04	4.27E-04	3.81E-04	4.20E-04	4.74E-04	5.13E-04	5.97E-04	6.86E-04	6.24E-04	4.14E-04	2.93E-04	2.67E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	2.66E-05	2.06E-05	1.44E-05	1.08E-05	9.05E-06	1.40E-05	3.07E-05	7.06E-05	1.52E-04	1.36E-04	1.12E-04	1.04E-04	1.07E-04	9.52E-05	1.05E-04	1.18E-04	1.28E-04	1.49E-04	1.71E-04	1.56E-04	1.04E-04	7.33E-05	6.67E-05	5.77E-05
	Emission in each Box of 2nd jet	g/s	1.52E-05	1.18E-05	8.20E-06	6.17E-06	5.17E-06	7.99E-06	1.76E-05	4.03E-05	8.71E-05	7.74E-05	6.41E-05	5.93E-05	6.09E-05	5.44E-05	6.00E-05	6.77E-05	7.33E-05	8.53E-05	9.80E-05	8.91E-05	5.92E-05	4.19E-05	3.81E-05	3.30E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1156	0.0976	0.0989	0.1052	0.1073	0.2008	0.2130	0.1612	0.1898	0.1750	0.1603	0.1571	0.1242	0.1216	0.1250	0.1308	0.1374	0.1444	0.1550	0.1461	0.1224	0.1132	0.1102	0.1073
	NO2	g/vehicle/km	0.0203	0.0194	0.0196	0.0202	0.0204	0.0254	0.0261	0.0244	0.0355	0.0326	0.0293	0.0283	0.0251	0.0243	0.0253	0.0267	0.0282	0.0298	0.0325	0.0305	0.0249	0.0219	0.0211	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0013***	***0.0029***	***0.0053***	***0.0093***	***0.0084***	***0.0070***	***0.0066***	***0.0060***	***0.0055***	***0.0060***	***0.0066***	***0.0073***	***0.0083***	***0.0094***	***0.0085***	***0.0058***	***0.0044***	***0.0040***	***0.0035***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.15E-03	7.82E-04	5.46E-04	4.32E-04	3.66E-04	8.52E-04	1.94E-03	3.56E-03	6.23E-03	5.57E-03	4.68E-03	4.39E-03	4.02E-03	3.69E-03	4.02E-03	4.43E-03	4.86E-03	5.51E-03	6.26E-03	5.67E-03	3.89E-03	2.94E-03	2.68E-03	2.30E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.73E-04	3.91E-04	2.73E-04	2.16E-04	1.83E-04	4.26E-04	9.68E-04	1.78E-03	3.12E-03	2.78E-03	2.34E-03	2.19E-03	2.01E-03	1.85E-03	2.01E-03	2.21E-03	2.43E-03	2.76E-03	3.13E-03	2.83E-03	1.94E-03	1.47E-03	1.34E-03	1.15E-03
	Emission in each Box of 1st jet	g/s	1.43E-04	9.77E-05	6.83E-05	5.40E-05	4.58E-05	1.06E-04	2.42E-04	4.45E-04	7.79E-04	6.96E-04	5.85E-04	5.49E-04	5.03E-04	4.61E-04	5.03E-04	5.53E-04	6.08E-04	6.89E-04	7.82E-04	7.09E-04	4.86E-04	3.67E-04	3.35E-04	2.88E-04
	Emission in each Box of 2nd jet	g/s	8.19E-05	5.58E-05	3.90E-05	3.09E-05	2.62E-05	6.08E-05	1.38E-04	2.54E-04	4.45E-04	3.98E-04	3.34E-04	3.13E-04	2.87E-04	2.64E-04	2.87E-04	3.16E-04	3.47E-04	3.94E-04	4.47E-04	4.05E-04	2.78E-04	2.10E-04	1.91E-04	1.65E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0017***	***0.0016***	***0.0013***	***0.0012***	***0.0012***	***0.0011***	***0.0012***	***0.0014***	***0.0015***	***0.0017***	***0.0020***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.01E-04	1.56E-04	1.08E-04	8.31E-05	6.96E-05	1.08E-04	2.37E-04	5.38E-04	1.17E-03	1.04E-03	8.55E-04	7.92E-04	8.14E-04	7.38E-04	8.14E-04	9.03E-04	9.97E-04	1.14E-03	1.31E-03	1.19E-03	7.89E-04	5.67E-04	5.14E-04	4.43E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.00E-04	7.79E-05	5.41E-05	4.15E-05	3.48E-05	5.39E-05	1.19E-04	2.69E-04	5.83E-04	5.19E-04	4.28E-04	3.96E-04	4.07E-04	3.69E-04	4.07E-04	4.52E-04	4.98E-04	5.69E-04	6.55E-04	5.93E-04	3.95E-04	2.84E-04	2.57E-04	2.22E-04
	Emission in each Box of 1st jet	g/s	2.51E-05	1.95E-05	1.35E-05	1.04E-05	8.70E-06	1.35E-05	2.97E-05	6.73E-05	1.46E-04	1.30E-04	1.07E-04	9.90E-05	1.02E-04	9.22E-05	1.02E-04	1.13E-04	1.25E-04	1.42E-04	1.64E-04	1.48E-04	9.87E-05	7.09E-05	6.43E-05	5.54E-05
	Emission in each Box of 2nd jet	g/s	1.43E-05	1.11E-05	7.73E-06	5.93E-06	4.97E-06	7.71E-06	1.69E-05	3.85E-05	8.33E-05	7.41E-05	6.11E-05	5.65E-05	5.81E-05	5.27E-05	5.81E-05	6.45E-05	7.12E-05	8.13E-05	9.36E-05	8.46E-05	5.64E-05	4.05E-05	3.67E-05	3.17E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1037	0.0868	0.0884	0.0914	0.0932	0.1750	0.1834	0.1397	0.1669	0.1531	0.1426	0.1394	0.1109	0.1082	0.1119	0.1166	0.1221	0.1302	0.1363	0.1308	0.1093	0.0981	0.0963	0.0936
	NO2	g/vehicle/km	0.0183	0.0175	0.0177	0.0178	0.0180	0.0224	0.0227	0.0213	0.0315	0.0287	0.0262	0.0253	0.0226	0.0218	0.0228	0.0239	0.0252	0.0270	0.0287	0.0275	0.0224	0.0192	0.0187	0.0182
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0006***	***0.0005***	***0.0011***	***0.0025***	***0.0046***	***0.0082***	***0.0073***	***0.0062***	***0.0058***	***0.0054***	***0.0049***	***0.0054***	***0.0059***	***0.0065***	***0.0075***	***0.0083***	***0.0076***	***0.0052***	***0.0038***	***0.0035***	***0.0030***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.03E-03	6.95E-04	4.88E-04	3.75E-04	3.18E-04	7.42E-04	1.67E-03	3.08E-03	5.48E-03	4.87E-03	4.16E-03	3.89E-03	3.60E-03	3.28E-03	3.60E-03	3.94E-03	4.32E-03	4.97E-03	5.50E-03	5.08E-03	3.47E-03	2.55E-03	2.34E-03	2.01E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.14E-04	3.48E-04	2.44E-04	1.88E-04	1.59E-04	3.71E-04	8.33E-04	1.54E-03	2.74E-03	2.44E-03	2.08E-03	1.95E-03	1.80E-03	1.64E-03	1.80E-03	1.97E-03	2.16E-03	2.49E-03	2.75E-03	2.54E-03	1.74E-03	1.27E-03	1.17E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	1.29E-04	8.69E-05	6.10E-05	4.69E-05	3.98E-05	9.28E-05	2.08E-04	3.85E-04	6.85E-04	6.09E-04	5.20E-04	4.87E-04	4.49E-04	4.10E-04	4.50E-04	4.93E-04	5.40E-04	6.21E-04	6.88E-04	6.35E-04	4.34E-04	3.18E-04	2.93E-04	2.51E-04
	Emission in each Box of 2nd jet	g/s	7.35E-05	4.97E-05	3.48E-05	2.68E-05	2.27E-05	5.30E-05	1.19E-04	2.20E-04	3.91E-04	3.48E-04	2.97E-04	2.78E-04	2.57E-04	2.34E-04	2.57E-04	2.82E-04	3.09E-04	3.55E-04	3.93E-04	3.63E-04	2.48E-04	1.82E-04	1.67E-04	1.44E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0011***	***0.0011***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0015***	***0.0017***	***0.0016***	***0.0011***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.82E-04	1.40E-04	9.76E-05	7.32E-05	6.14E-05	9.49E-05	2.06E-04	4.71E-04	1.03E-03	9.13E-04	7.65E-04	7.07E-04	7.31E-04	6.60E-04	7.33E-04	8.10E-04	8.92E-04	1.03E-03	1.16E-03	1.07E-03	7.10E-04	4.97E-04	4.54E-04	3.91E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.08E-05	7.01E-05	4.88E-05	3.66E-05	3.07E-05	4.74E-05	1.03E-04	2.35E-04	5.16E-04	4.57E-04	3.83E-04	3.54E-04	3.66E-04	3.30E-04	3.66E-04	4.05E-04	4.46E-04	5.16E-04	5.80E-04	5.35E-04	3.55E-04	2.49E-04	2.27E-04	1.95E-04
	Emission in each Box of 1st jet	g/s	2.27E-05	1.75E-05	1.22E-05	9.15E-06	7.68E-06	1.19E-05	2.58E-05	5.89E-05	1.29E-04	1.14E-04	9.57E-05	8.84E-05	9.14E-05	8.25E-05	9.16E-05	1.01E-04	1.11E-04	1.29E-04	1.45E-04	1.34E-04	8.88E-05	6.22E-05	5.68E-05	4.89E-05
	Emission in each Box of 2nd jet	g/s	1.30E-05	1.00E-05	6.97E-06	5.23E-06	4.39E-06	6.78E-06	1.47E-05	3.36E-05	7.38E-05	6.52E-05	5.47E-05	5.05E-05	5.22E-05	4.71E-05	5.23E-05	5.78E-05	6.37E-05	7.38E-05	8.28E-05	7.64E-05	5.07E-05	3.55E-05	3.24E-05	2.79E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1000	0.0841	0.0878	0.0908	0.0921	0.1731	0.1791	0.1379	0.1632	0.1527	0.1379	0.1348	0.1065	0.1045	0.1067	0.1127	0.1200	0.1269	0.1336	0.1292	0.1080	0.0975	0.0952	0.0930
	NO2	g/vehicle/km	0.0177	0.0170	0.0176	0.0177	0.0178	0.0221	0.0222	0.0211	0.0309	0.0286	0.0255	0.0246	0.0218	0.0211	0.0218	0.0232	0.0248	0.0265	0.0282	0.0273	0.0221	0.0191	0.0185	0.0181
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0006***	***0.0005***	***0.0011***	***0.0024***	***0.0046***	***0.0080***	***0.0073***	***0.0060***	***0.0056***	***0.0052***	***0.0048***	***0.0052***	***0.0057***	***0.0064***	***0.0073***	***0.0081***	***0.0075***	***0.0051***	***0.0038***	***0.0035***	***0.0030***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.91E-04	6.74E-04	4.85E-04	3.73E-04	3.15E-04	7.34E-04	1.63E-03	3.04E-03	5.36E-03	4.86E-03	4.02E-03	3.77E-03	3.45E-03	3.17E-03	3.43E-03	3.81E-03	4.25E-03	4.85E-03	5.40E-03	5.02E-03	3.43E-03	2.53E-03	2.31E-03	2.00E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.96E-04	3.37E-04	2.42E-04	1.86E-04	1.57E-04	3.67E-04	8.14E-04	1.52E-03	2.68E-03	2.43E-03	2.01E-03	1.88E-03	1.73E-03	1.59E-03	1.72E-03	1.91E-03	2.12E-03	2.42E-03	2.70E-03	2.51E-03	1.72E-03	1.26E-03	1.16E-03	9.99E-04
	Emission in each Box of 1st jet	g/s	1.24E-04	8.42E-05	6.06E-05	4.66E-05	3.94E-05	9.18E-05	2.03E-04	3.80E-04	6.69E-04	6.07E-04	5.03E-04	4.71E-04	4.31E-04	3.96E-04	4.29E-04	4.76E-04	5.31E-04	6.06E-04	6.75E-04	6.27E-04	4.29E-04	3.16E-04	2.89E-04	2.50E-04
	Emission in each Box of 2nd jet	g/s	7.08E-05	4.81E-05	3.46E-05	2.66E-05	2.25E-05	5.24E-05	1.16E-04	2.17E-04	3.83E-04	3.47E-04	2.87E-04	2.69E-04	2.47E-04	2.27E-04	2.45E-04	2.72E-04	3.03E-04	3.46E-04	3.85E-04	3.58E-04	2.45E-04	1.81E-04	1.65E-04	1.43E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0011***	***0.0010***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0015***	***0.0017***	***0.0016***	***0.0011***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.76E-04	1.36E-04	9.71E-05	7.29E-05	6.07E-05	9.39E-05	2.02E-04	4.66E-04	1.01E-03	9.11E-04	7.44E-04	6.87E-04	7.05E-04	6.41E-04	7.02E-04	7.86E-04	8.79E-04	1.01E-03	1.14E-03	1.06E-03	7.03E-04	4.95E-04	4.49E-04	3.89E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.78E-05	6.81E-05	4.86E-05	3.64E-05	3.04E-05	4.70E-05	1.01E-04	2.33E-04	5.06E-04	4.56E-04	3.72E-04	3.44E-04	3.53E-04	3.20E-04	3.51E-04	3.93E-04	4.39E-04	5.05E-04	5.70E-04	5.29E-04	3.52E-04	2.47E-04	2.25E-04	1.95E-04
	Emission in each Box of 1st jet	g/s	2.20E-05	1.70E-05	1.21E-05	9.11E-06	7.59E-06	1.17E-05	2.52E-05	5.82E-05	1.27E-04	1.14E-04	9.30E-05	8.59E-05	8.82E-05	8.01E-05	8.78E-05	9.83E-05	1.10E-04	1.26E-04	1.42E-04	1.32E-04	8.79E-05	6.19E-05	5.62E-05	4.86E-05
	Emission in each Box of 2nd jet	g/s	1.25E-05	9.74E-06	6.94E-06	5.21E-06	4.34E-06	6.71E-06	1.44E-05	3.33E-05	7.23E-05	6.51E-05	5.31E-05	4.91E-05	5.04E-05	4.58E-05	5.02E-05	5.62E-05	6.28E-05	7.21E-05	8.14E-05	7.56E-05	5.02E-05	3.53E-05	3.21E-05	2.78E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104B01-104B15
Enclosure Involvec: 104P2
Road Located: 106
Vehicle EF Adopte: 104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1006	0.0836	0.0851	0.0879	0.0897	0.1676	0.1791	0.1345	0.1592	0.1476	0.1386	0.1364	0.1045	0.1027	0.1080	0.1133	0.1179	0.1266	0.1322	0.1278	0.1060	0.0963	0.0940	0.0906
	NO2	g/vehicle/km	0.0178	0.0169	0.0171	0.0172	0.0174	0.0215	0.0222	0.0206	0.0301	0.0277	0.0256	0.0248	0.0214	0.0208	0.0220	0.0233	0.0244	0.0264	0.0279	0.0270	0.0218	0.0189	0.0183	0.0177
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0011***	***0.0024***	***0.0045***	***0.0078***	***0.0070***	***0.0061***	***0.0057***	***0.0051***	***0.0047***	***0.0052***	***0.0057***	***0.0063***	***0.0072***	***0.0080***	***0.0074***	***0.0051***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.98E-04	6.70E-04	4.70E-04	3.61E-04	3.06E-04	7.11E-04	1.63E-03	2.97E-03	5.23E-03	4.70E-03	4.04E-03	3.81E-03	3.39E-03	3.12E-03	3.48E-03	3.83E-03	4.17E-03	4.83E-03	5.34E-03	4.96E-03	3.37E-03	2.50E-03	2.29E-03	1.94E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.99E-04	3.35E-04	2.35E-04	1.81E-04	1.53E-04	3.55E-04	8.14E-04	1.48E-03	2.61E-03	2.35E-03	2.02E-03	1.91E-03	1.69E-03	1.56E-03	1.74E-03	1.92E-03	2.09E-03	2.42E-03	2.67E-03	2.48E-03	1.68E-03	1.25E-03	1.14E-03	9.72E-04
	Emission in each Box of 1st jet	g/s	1.25E-04	8.37E-05	5.87E-05	4.51E-05	3.83E-05	8.88E-05	2.03E-04	3.71E-04	6.53E-04	5.87E-04	5.05E-04	4.76E-04	4.23E-04	3.89E-04	4.35E-04	4.79E-04	5.22E-04	6.04E-04	6.67E-04	6.20E-04	4.21E-04	3.12E-04	2.86E-04	2.43E-04
	Emission in each Box of 2nd jet	g/s	7.13E-05	4.79E-05	3.35E-05	2.58E-05	2.19E-05	5.08E-05	1.16E-04	2.12E-04	3.73E-04	3.36E-04	2.89E-04	2.72E-04	2.42E-04	2.23E-04	2.48E-04	2.74E-04	2.98E-04	3.45E-04	3.81E-04	3.54E-04	2.41E-04	1.78E-04	1.63E-04	1.39E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0013***	***0.0011***	***0.0010***	***0.0010***	***0.0009***	***0.0011***	***0.0012***	***0.0013***	***0.0015***	***0.0017***	***0.0016***	***0.0010***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.77E-04	1.36E-04	9.44E-05	7.08E-05	5.93E-05	9.13E-05	2.02E-04	4.55E-04	9.88E-04	8.82E-04	7.46E-04	6.94E-04	6.93E-04	6.30E-04	7.10E-04	7.89E-04	8.63E-04	1.01E-03	1.13E-03	1.05E-03	6.91E-04	4.89E-04	4.44E-04	3.80E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.83E-05	6.78E-05	4.72E-05	3.54E-05	2.97E-05	4.56E-05	1.01E-04	2.27E-04	4.94E-04	4.41E-04	3.73E-04	3.47E-04	3.47E-04	3.15E-04	3.55E-04	3.95E-04	4.32E-04	5.03E-04	5.64E-04	5.23E-04	3.46E-04	2.45E-04	2.22E-04	1.90E-04
	Emission in each Box of 1st jet	g/s	2.21E-05	1.70E-05	1.18E-05	8.85E-06	7.42E-06	1.14E-05	2.52E-05	5.69E-05	1.23E-04	1.10E-04	9.33E-05	8.67E-05	8.67E-05	7.88E-05	8.87E-05	9.87E-05	1.08E-04	1.26E-04	1.41E-04	1.31E-04	8.64E-05	6.11E-05	5.55E-05	4.75E-05
	Emission in each Box of 2nd jet	g/s	1.26E-05	9.69E-06	6.74E-06	5.06E-06	4.24E-06	6.52E-06	1.44E-05	3.25E-05	7.06E-05	6.30E-05	5.33E-05	4.95E-05	4.95E-05	4.50E-05	5.07E-05	5.64E-05	6.17E-05	7.19E-05	8.06E-05	7.47E-05	4.94E-05	3.49E-05	3.17E-05	2.71E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																								
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1020	0.0853	0.0868	0.0898	0.0916	0.1711	0.1827	0.1379	0.1611	0.1481	0.1408	0.1366	0.1065	0.1045	0.1074	0.1127	0.1208	0.1261	0.1360	0.1277	0.1062	0.0963	0.0940	0.0918
	NO2	g/vehicle/km	0.0180	0.0172	0.0174	0.0176	0.0177	0.0219	0.0226	0.0211	0.0304	0.0278	0.0260	0.0249	0.0218	0.0211	0.0220	0.0232	0.0250	0.0263	0.0287	0.0270	0.0217	0.0189	0.0183	0.0179
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0006***	***0.0005***	***0.0011***	***0.0025***	***0.0046***	***0.0079***	***0.0071***	***0.0062***	***0.0057***	***0.0052***	***0.0048***	***0.0052***	***0.0057***	***0.0064***	***0.0072***	***0.0082***	***0.0074***	***0.0051***	***0.0037***	***0.0034***	***0.0030***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.01E-03	6.83E-04	4.79E-04	3.69E-04	3.13E-04	7.26E-04	1.66E-03	3.04E-03	5.29E-03	4.71E-03	4.11E-03	3.82E-03	3.45E-03	3.17E-03	3.46E-03	3.81E-03	4.27E-03	4.81E-03	5.49E-03	4.96E-03	3.37E-03	2.50E-03	2.29E-03	1.97E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.06E-04	3.42E-04	2.40E-04	1.84E-04	1.56E-04	3.63E-04	8.30E-04	1.52E-03	2.64E-03	2.36E-03	2.05E-03	1.91E-03	1.73E-03	1.59E-03	1.73E-03	1.91E-03	2.14E-03	2.41E-03	2.75E-03	2.48E-03	1.69E-03	1.25E-03	1.14E-03	9.86E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.54E-05	5.99E-05	4.61E-05	3.91E-05	9.07E-05	2.08E-04	3.80E-04	6.61E-04	5.89E-04	5.14E-04	4.77E-04	4.31E-04	3.96E-04	4.32E-04	4.76E-04	5.34E-04	6.02E-04	6.87E-04	6.20E-04	4.21E-04	3.12E-04	2.86E-04	2.47E-04
	Emission in each Box of 2nd jet	g/s	7.22E-05	4.88E-05	3.42E-05	2.63E-05	2.23E-05	5.18E-05	1.19E-04	2.17E-04	3.78E-04	3.37E-04	2.93E-04	2.73E-04	2.47E-04	2.27E-04	2.47E-04	2.72E-04	3.05E-04	3.44E-04	3.92E-04	3.54E-04	2.41E-04	1.78E-04	1.63E-04	1.41E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0013***	***0.0011***	***0.0010***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0015***	***0.0017***	***0.0016***	***0.0010***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.79E-04	1.38E-04	9.61E-05	7.22E-05	6.05E-05	9.30E-05	2.05E-04	4.66E-04	9.99E-04	8.86E-04	7.57E-04	6.95E-04	7.05E-04	6.41E-04	7.07E-04	7.86E-04	8.84E-04	1.00E-03	1.16E-03	1.05E-03	6.90E-04	4.89E-04	4.44E-04	3.85E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.94E-05	6.90E-05	4.81E-05	3.61E-05	3.02E-05	4.65E-05	1.03E-04	2.33E-04	4.99E-04	4.43E-04	3.79E-04	3.48E-04	3.53E-04	3.20E-04	3.53E-04	3.93E-04	4.42E-04	5.02E-04	5.79E-04	5.23E-04	3.45E-04	2.45E-04	2.22E-04	1.92E-04
	Emission in each Box of 1st jet	g/s	2.24E-05	1.73E-05	1.20E-05	9.02E-06	7.56E-06	1.16E-05	2.57E-05	5.82E-05	1.25E-04	1.11E-04	9.47E-05	8.69E-05	8.82E-05	8.01E-05	8.84E-05	9.83E-05	1.10E-04	1.26E-04	1.45E-04	1.31E-04	8.62E-05	6.12E-05	5.55E-05	4.81E-05
	Emission in each Box of 2nd jet	g/s	1.28E-05	9.86E-06	6.87E-06	5.15E-06	4.32E-06	6.64E-06	1.47E-05	3.33E-05	7.14E-05	6.33E-05	5.41E-05	4.97E-05	5.04E-05	4.58E-05	5.05E-05	5.62E-05	6.31E-05	7.17E-05	8.28E-05	7.47E-05	4.93E-05	3.50E-05	3.17E-05	2.75E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1013	0.0847	0.0861	0.0885	0.0932	0.1740	0.1847	0.1362	0.1625	0.1498	0.1426	0.1365	0.1079	0.1074	0.1096	0.1158	0.1196	0.1257	0.1353	0.1261	0.1093	0.0987	0.0963	0.0941
	NO2	g/vehicle/km	0.0179	0.0171	0.0173	0.0173	0.0180	0.0223	0.0228	0.0209	0.0307	0.0281	0.0262	0.0248	0.0220	0.0216	0.0223	0.0238	0.0247	0.0262	0.0286	0.0266	0.0224	0.0193	0.0187	0.0183
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0011***	***0.0025***	***0.0045***	***0.0080***	***0.0072***	***0.0062***	***0.0057***	***0.0052***	***0.0049***	***0.0053***	***0.0059***	***0.0063***	***0.0072***	***0.0082***	***0.0073***	***0.0052***	***0.0038***	***0.0035***	***0.0030***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.00E-03	6.78E-04	4.76E-04	3.63E-04	3.18E-04	7.38E-04	1.68E-03	3.01E-03	5.33E-03	4.77E-03	4.16E-03	3.81E-03	3.50E-03	3.26E-03	3.53E-03	3.92E-03	4.23E-03	4.80E-03	5.47E-03	4.89E-03	3.47E-03	2.56E-03	2.34E-03	2.02E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.02E-04	3.39E-04	2.38E-04	1.82E-04	1.59E-04	3.69E-04	8.40E-04	1.50E-03	2.67E-03	2.38E-03	2.08E-03	1.91E-03	1.75E-03	1.63E-03	1.76E-03	1.96E-03	2.12E-03	2.40E-03	2.73E-03	2.45E-03	1.74E-03	1.28E-03	1.17E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	1.25E-04	8.48E-05	5.94E-05	4.54E-05	3.98E-05	9.22E-05	2.10E-04	3.76E-04	6.66E-04	5.96E-04	5.20E-04	4.77E-04	4.37E-04	4.07E-04	4.41E-04	4.90E-04	5.29E-04	6.00E-04	6.83E-04	6.12E-04	4.34E-04	3.20E-04	2.93E-04	2.53E-04
	Emission in each Box of 2nd jet	g/s	7.17E-05	4.85E-05	3.40E-05	2.60E-05	2.27E-05	5.27E-05	1.20E-04	2.15E-04	3.81E-04	3.41E-04	2.97E-04	2.72E-04	2.50E-04	2.33E-04	2.52E-04	2.80E-04	3.02E-04	3.43E-04	3.90E-04	3.50E-04	2.48E-04	1.83E-04	1.67E-04	1.44E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0013***	***0.0011***	***0.0010***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0015***	***0.0017***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.78E-04	1.37E-04	9.54E-05	7.12E-05	6.14E-05	9.44E-05	2.07E-04	4.60E-04	1.01E-03	8.94E-04	7.65E-04	6.94E-04	7.13E-04	6.56E-04	7.19E-04	8.05E-04	8.74E-04	1.00E-03	1.15E-03	1.03E-03	7.10E-04	5.00E-04	4.54E-04	3.93E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.88E-05	6.85E-05	4.77E-05	3.56E-05	3.07E-05	4.72E-05	1.04E-04	2.30E-04	5.04E-04	4.47E-04	3.83E-04	3.47E-04	3.56E-04	3.28E-04	3.59E-04	4.02E-04	4.37E-04	5.00E-04	5.76E-04	5.17E-04	3.55E-04	2.50E-04	2.27E-04	1.97E-04
	Emission in each Box of 1st jet	g/s	2.22E-05	1.71E-05	1.19E-05	8.90E-06	7.68E-06	1.18E-05	2.59E-05	5.75E-05	1.26E-04	1.12E-04	9.57E-05	8.67E-05	8.91E-05	8.20E-05	8.99E-05	1.01E-04	1.09E-04	1.25E-04	1.44E-04	1.29E-04	8.88E-05	6.25E-05	5.68E-05	4.92E-05
	Emission in each Box of 2nd jet	g/s	1.27E-05	9.79E-06	6.82E-06	5.09E-06	4.39E-06	6.75E-06	1.48E-05	3.29E-05	7.20E-05	6.39E-05	5.47E-05	4.95E-05	5.09E-05	4.69E-05	5.14E-05	5.75E-05	6.24E-05	7.14E-05	8.23E-05	7.39E-05	5.07E-05	3.57E-05	3.24E-05	2.81E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1145	0.0966	0.0979	0.1014	0.1030	0.1925	0.2052	0.1567	0.1845	0.1700	0.1556	0.1525	0.1212	0.1181	0.1214	0.1276	0.1336	0.1401	0.1519	0.1437	0.1210	0.1099	0.1074	0.1044
	NO2	g/vehicle/km	0.0201	0.0193	0.0194	0.0196	0.0196	0.0245	0.0252	0.0238	0.0346	0.0317	0.0285	0.0276	0.0245	0.0236	0.0245	0.0261	0.0274	0.0290	0.0318	0.0301	0.0245	0.0213	0.0207	0.0202
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0028***	***0.0052***	***0.0091***	***0.0081***	***0.0068***	***0.0064***	***0.0059***	***0.0054***	***0.0059***	***0.0065***	***0.0071***	***0.0080***	***0.0092***	***0.0084***	***0.0058***	***0.0043***	***0.0039***	***0.0034***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.14E-03	7.74E-04	5.41E-04	4.17E-04	3.52E-04	8.17E-04	1.86E-03	3.46E-03	6.06E-03	5.41E-03	4.54E-03	4.26E-03	3.93E-03	3.59E-03	3.91E-03	4.32E-03	4.73E-03	5.35E-03	6.13E-03	5.58E-03	3.84E-03	2.85E-03	2.61E-03	2.24E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.68E-04	3.87E-04	2.70E-04	2.08E-04	1.76E-04	4.08E-04	9.32E-04	1.73E-03	3.03E-03	2.71E-03	2.27E-03	2.13E-03	1.96E-03	1.79E-03	1.95E-03	2.16E-03	2.36E-03	2.67E-03	3.07E-03	2.79E-03	1.92E-03	1.43E-03	1.31E-03	1.12E-03
	Emission in each Box of 1st jet	g/s	1.42E-04	9.67E-05	6.76E-05	5.21E-05	4.40E-05	1.02E-04	2.33E-04	4.32E-04	7.57E-04	6.76E-04	5.67E-04	5.32E-04	4.91E-04	4.48E-04	4.89E-04	5.39E-04	5.91E-04	6.68E-04	7.67E-04	6.97E-04	4.80E-04	3.56E-04	3.26E-04	2.80E-04
	Emission in each Box of 2nd jet	g/s	8.11E-05	5.53E-05	3.86E-05	2.98E-05	2.51E-05	5.83E-05	1.33E-04	2.47E-04	4.33E-04	3.87E-04	3.24E-04	3.04E-04	2.81E-04	2.56E-04	2.79E-04	3.08E-04	3.38E-04	3.82E-04	4.38E-04	3.98E-04	2.75E-04	2.04E-04	1.87E-04	1.60E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0017***	***0.0015***	***0.0012***	***0.0012***	***0.0012***	***0.0011***	***0.0012***	***0.0013***	***0.0015***	***0.0017***	***0.0019***	***0.0018***	***0.0012***	***0.0008***	***0.0008***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.99E-04	1.55E-04	1.07E-04	8.06E-05	6.70E-05	1.04E-04	2.29E-04	5.25E-04	1.14E-03	1.01E-03	8.32E-04	7.71E-04	7.93E-04	7.17E-04	7.90E-04	8.82E-04	9.71E-04	1.11E-03	1.28E-03	1.17E-03	7.78E-04	5.52E-04	5.02E-04	4.33E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.96E-05	7.73E-05	5.36E-05	4.03E-05	3.35E-05	5.19E-05	1.15E-04	2.63E-04	5.68E-04	5.04E-04	4.16E-04	3.85E-04	3.97E-04	3.58E-04	3.95E-04	4.41E-04	4.86E-04	5.54E-04	6.42E-04	5.84E-04	3.89E-04	2.76E-04	2.51E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.49E-05	1.93E-05	1.34E-05	1.01E-05	8.38E-06	1.30E-05	2.87E-05	6.56E-05	1.42E-04	1.26E-04	1.04E-04	9.63E-05	9.92E-05	8.96E-05	9.88E-05	1.10E-04	1.21E-04	1.38E-04	1.61E-04	1.46E-04	9.73E-05	6.90E-05	6.28E-05	5.41E-05
	Emission in each Box of 2nd jet	g/s	1.42E-05	1.10E-05	7.66E-06	5.75E-06	4.79E-06	7.42E-06	1.64E-05	3.75E-05	8.12E-05	7.20E-05	5.94E-05	5.50E-05	5.67E-05	5.12E-05	5.64E-05	6.30E-05	6.94E-05	7.91E-05	9.17E-05	8.34E-05	5.56E-05	3.94E-05	3.59E-05	3.09E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1259	0.1077	0.1095	0.1145	0.1167	0.2175	0.2313	0.1764	0.2083	0.1925	0.1761	0.1716	0.1346	0.1313	0.1348	0.1418	0.1476	0.1576	0.1675	0.1609	0.1348	0.1224	0.1198	0.1171
	NO2	g/vehicle/km	0.0219	0.0212	0.0214	0.0218	0.0219	0.0274	0.0282	0.0266	0.0387	0.0355	0.0320	0.0308	0.0270	0.0260	0.0271	0.0288	0.0301	0.0324	0.0348	0.0334	0.0271	0.0235	0.0228	0.0224
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0019***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0014***	***0.0032***	***0.0058***	***0.0103***	***0.0092***	***0.0077***	***0.0072***	***0.0065***	***0.0060***	***0.0065***	***0.0072***	***0.0078***	***0.0090***	***0.0101***	***0.0094***	***0.0064***	***0.0048***	***0.0044***	***0.0038***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.25E-03	8.63E-04	6.04E-04	4.70E-04	3.99E-04	9.23E-04	2.10E-03	3.89E-03	6.84E-03	6.13E-03	5.14E-03	4.79E-03	4.36E-03	3.98E-03	4.34E-03	4.80E-03	5.22E-03	6.02E-03	6.76E-03	6.24E-03	4.28E-03	3.18E-03	2.91E-03	2.51E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.24E-04	4.32E-04	3.02E-04	2.35E-04	1.99E-04	4.61E-04	1.05E-03	1.95E-03	3.42E-03	3.06E-03	2.57E-03	2.40E-03	2.18E-03	1.99E-03	2.17E-03	2.40E-03	2.61E-03	3.01E-03	3.38E-03	3.12E-03	2.14E-03	1.59E-03	1.46E-03	1.26E-03
	Emission in each Box of 1st jet	g/s	1.56E-04	1.08E-04	7.55E-05	5.88E-05	4.98E-05	1.15E-04	2.63E-04	4.86E-04	8.54E-04	7.66E-04	6.42E-04	5.99E-04	5.45E-04	4.98E-04	5.43E-04	6.00E-04	6.53E-04	7.52E-04	8.45E-04	7.80E-04	5.35E-04	3.97E-04	3.64E-04	3.14E-04
	Emission in each Box of 2nd jet	g/s	8.92E-05	6.17E-05	4.32E-05	3.36E-05	2.85E-05	6.59E-05	1.50E-04	2.78E-04	4.88E-04	4.38E-04	3.67E-04	3.42E-04	3.12E-04	2.85E-04	3.10E-04	3.43E-04	3.73E-04	4.30E-04	4.83E-04	4.46E-04	3.06E-04	2.27E-04	2.08E-04	1.80E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0019***	***0.0017***	***0.0014***	***0.0013***	***0.0013***	***0.0012***	***0.0013***	***0.0015***	***0.0016***	***0.0019***	***0.0021***	***0.0019***	***0.0013***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.17E-04	1.70E-04	1.18E-04	8.94E-05	7.49E-05	1.16E-04	2.56E-04	5.86E-04	1.27E-03	1.13E-03	9.34E-04	8.61E-04	8.75E-04	7.90E-04	8.71E-04	9.74E-04	1.07E-03	1.24E-03	1.41E-03	1.30E-03	8.60E-04	6.10E-04	5.56E-04	4.81E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.08E-04	8.49E-05	5.90E-05	4.47E-05	3.75E-05	5.80E-05	1.28E-04	2.93E-04	6.35E-04	5.66E-04	4.67E-04	4.30E-04	4.37E-04	3.95E-04	4.36E-04	4.87E-04	5.33E-04	6.18E-04	7.03E-04	6.48E-04	4.30E-04	3.05E-04	2.78E-04	2.40E-04
	Emission in each Box of 1st jet	g/s	2.71E-05	2.12E-05	1.47E-05	1.12E-05	9.37E-06	1.45E-05	3.20E-05	7.33E-05	1.59E-04	1.41E-04	1.17E-04	1.08E-04	1.09E-04	9.87E-05	1.09E-04	1.22E-04	1.33E-04	1.54E-04	1.76E-04	1.62E-04	1.07E-04	7.62E-05	6.94E-05	6.01E-05
	Emission in each Box of 2nd jet	g/s	1.55E-05	1.21E-05	8.42E-06	6.39E-06	5.35E-06	8.29E-06	1.83E-05	4.19E-05	9.08E-05	8.08E-05	6.67E-05	6.15E-05	6.25E-05	5.64E-05	6.22E-05	6.96E-05	7.61E-05	8.82E-05	1.00E-04	9.25E-05	6.14E-05	4.36E-05	3.97E-05	3.43E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1733	1660	1926	1803	1913	2010	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1332	0.1131	0.1149	0.1195	0.1234	0.2281	0.2418	0.1844	0.2175	0.2008	0.1831	0.1787	0.1399	0.1364	0.1406	0.1476	0.1535	0.1635	0.1756	0.1664	0.1401	0.1270	0.1260	0.1232
	NO2	g/vehicle/km	0.0230	0.0221	0.0223	0.0226	0.0230	0.0286	0.0293	0.0276	0.0402	0.0369	0.0331	0.0319	0.0280	0.0270	0.0281	0.0298	0.0312	0.0334	0.0363	0.0344	0.0280	0.0242	0.0238	0.0233
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0020***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0015***	***0.0033***	***0.0061***	***0.0107***	***0.0096***	***0.0080***	***0.0075***	***0.0068***	***0.0062***	***0.0068***	***0.0075***	***0.0081***	***0.0094***	***0.0106***	***0.0097***	***0.0067***	***0.0049***	***0.0046***	***0.0040***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.32E-03	9.06E-04	6.34E-04	4.91E-04	4.22E-04	9.68E-04	2.20E-03	4.07E-03	7.14E-03	6.39E-03	5.34E-03	4.99E-03	4.53E-03	4.14E-03	4.53E-03	4.99E-03	5.43E-03	6.24E-03	7.09E-03	6.46E-03	4.45E-03	3.29E-03	3.06E-03	2.65E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.60E-04	4.53E-04	3.17E-04	2.45E-04	2.11E-04	4.84E-04	1.10E-03	2.03E-03	3.57E-03	3.20E-03	2.67E-03	2.50E-03	2.27E-03	2.07E-03	2.26E-03	2.50E-03	2.72E-03	3.12E-03	3.54E-03	3.23E-03	2.22E-03	1.65E-03	1.53E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	1.65E-04	1.13E-04	7.93E-05	6.14E-05	5.27E-05	1.21E-04	2.75E-04	5.09E-04	8.92E-04	7.99E-04	6.68E-04	6.24E-04	5.67E-04	5.17E-04	5.66E-04	6.24E-04	6.79E-04	7.80E-04	8.86E-04	8.07E-04	5.56E-04	4.12E-04	3.83E-04	3.31E-04
	Emission in each Box of 2nd jet	g/s	9.43E-05	6.47E-05	4.53E-05	3.51E-05	3.01E-05	6.91E-05	1.57E-04	2.91E-04	5.10E-04	4.57E-04	3.81E-04	3.57E-04	3.24E-04	2.96E-04	3.23E-04	3.57E-04	3.88E-04	4.46E-04	5.06E-04	4.61E-04	3.18E-04	2.35E-04	2.19E-04	1.89E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0020***	***0.0018***	***0.0014***	***0.0013***	***0.0014***	***0.0012***	***0.0014***	***0.0015***	***0.0017***	***0.0019***	***0.0022***	***0.0020***	***0.0013***	***0.0009***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.28E-04	1.77E-04	1.23E-04	9.27E-05	7.85E-05	1.21E-04	2.66E-04	6.09E-04	1.32E-03	1.17E-03	9.67E-04	8.92E-04	9.08E-04	8.19E-04	9.06E-04	1.01E-03	1.10E-03	1.27E-03	1.47E-03	1.34E-03	8.89E-04	6.28E-04	5.78E-04	5.01E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.14E-04	8.85E-05	6.15E-05	4.64E-05	3.92E-05	6.06E-05	1.33E-04	3.05E-04	6.60E-04	5.87E-04	4.83E-04	4.46E-04	4.54E-04	4.10E-04	4.53E-04	5.04E-04	5.52E-04	6.37E-04	7.33E-04	6.68E-04	4.45E-04	3.14E-04	2.89E-04	2.50E-04
	Emission in each Box of 1st jet	g/s	2.84E-05	2.21E-05	1.54E-05	1.16E-05	9.81E-06	1.51E-05	3.33E-05	7.61E-05	1.65E-04	1.47E-04	1.21E-04	1.12E-04	1.13E-04	1.02E-04	1.13E-04	1.26E-04	1.38E-04	1.59E-04	1.83E-04	1.67E-04	1.11E-04	7.85E-05	7.23E-05	6.26E-05
	Emission in each Box of 2nd jet	g/s	1.63E-05	1.26E-05	8.79E-06	6.62E-06	5.60E-06	8.65E-06	1.90E-05	4.35E-05	9.43E-05	8.38E-05	6.90E-05	6.37E-05	6.48E-05	5.85E-05	6.47E-05	7.21E-05	7.88E-05	9.11E-05	1.05E-04	9.54E-05	6.35E-05	4.49E-05	4.13E-05	3.58E-05
RSP Emission Rate		g/s	***1.35E-04***	***9.15E-05***	***6.45E-05***	***4.98E-05***	***4.25E-05***	***9.99E-05***	***2.27E-04***	***4.03E-04***	***6.05E-04***	***5.55E-04***	***4.84E-04***	***4.57E-04***	***4.23E-04***	***3.95E-04***	***4.21E-04***	***4.57E-04***	***4.89E-04***	***5.47E-04***	***6.06E-04***	***5.59E-04***	***4.14E-04***	***3.30E-04***	***3.09E-04***	***2.66E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	9.00E-05	6.10E-05	4.30E-05	3.32E-05	2.83E-05	6.66E-05	1.51E-04	2.69E-04	4.03E-04	3.70E-04	3.23E-04	3.05E-04	2.82E-04	2.63E-04	2.81E-04	3.04E-04	3.26E-04	3.65E-04	4.04E-04	3.73E-04	2.76E-04	2.20E-04	2.06E-04	1.77E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.50E-05	3.05E-05	2.15E-05	1.66E-05	1.42E-05	3.33E-05	7.57E-05	1.34E-04	2.02E-04	1.85E-04	1.61E-04	1.52E-04	1.41E-04	1.32E-04	1.40E-04	1.52E-04	1.63E-04	1.82E-04	2.02E-04	1.86E-04	1.38E-04	1.10E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	7.62E-06	5.38E-06	4.15E-06	3.54E-06	8.33E-06	1.89E-05	3.36E-05	5.04E-05	4.63E-05	4.04E-05	3.81E-05	3.52E-05	3.29E-05	3.51E-05	3.80E-05	4.08E-05	4.56E-05	5.05E-05	4.66E-05	3.45E-05	2.75E-05	2.57E-05	2.22E-05
	Emission in each Box of 2nd jet	g/s	6.43E-06	4.36E-06	3.07E-06	2.37E-06	2.02E-06	4.76E-06	1.08E-05	1.92E-05	2.88E-05	2.64E-05	2.31E-05	2.18E-05	2.01E-05	1.88E-05	2.00E-05	2.17E-05	2.33E-05	2.61E-05	2.89E-05	2.66E-05	1.97E-05	1.57E-05	1.47E-05	1.27E-05
FSP Emission Rate		g/s	***1.24E-04***	***8.42E-05***	***5.94E-05***	***4.59E-05***	***3.88E-05***	***9.20E-05***	***2.09E-04***	***3.71E-04***	***5.57E-04***	***5.11E-04***	***4.45E-04***	***4.20E-04***	***3.90E-04***	***3.62E-04***	***3.88E-04***	***4.18E-04***	***4.49E-04***	***5.05E-04***	***5.58E-04***	***5.13E-04***	***3.82E-04***	***3.05E-04***	***2.82E-04***	***2.45E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	8.29E-05	5.61E-05	3.96E-05	3.06E-05	2.59E-05	6.13E-05	1.39E-04	2.47E-04	3.71E-04	3.40E-04	2.96E-04	2.80E-04	2.60E-04	2.41E-04	2.59E-04	2.79E-04	2.99E-04	3.37E-04	3.72E-04	3.42E-04	2.55E-04	2.03E-04	1.88E-04	1.63E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	4.15E-05	2.81E-05	1.98E-05	1.53E-05	1.29E-05	3.07E-05	6.97E-05	1.24E-04	1.86E-04	1.70E-04	1.48E-04	1.40E-04	1.30E-04	1.21E-04	1.29E-04	1.39E-04	1.50E-04	1.68E-04	1.86E-04	1.71E-04	1.27E-04	1.02E-04	9.41E-05	8.17E-05
	Emission in each Box of 1st jet	g/s	1.04E-05	7.02E-06	4.95E-06	3.83E-06	3.24E-06	7.66E-06	1.74E-05	3.09E-05	4.64E-05	4.25E-05	3.71E-05	3.50E-05	3.25E-05	3.01E-05	3.23E-05	3.49E-05	3.74E-05	4.21E-05	4.65E-05	4.28E-05	3.18E-05	2.54E-05	2.35E-05	2.04E-05
	Emission in each Box of 2nd jet	g/s	5.92E-06	4.01E-06	2.83E-06	2.19E-06	1.85E-06	4.38E-06	9.95E-06	1.77E-05	2.65E-05	2.43E-05	2.12E-05	2.00E-05	1.86E-05	1.72E-05	1.85E-05	1.99E-05	2.14E-05	2.41E-05	2.66E-05	2.44E-05	1.82E-05	1.45E-05	1.34E-05	1.17E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1405	0.1200	0.1223	0.1272	0.1298	0.2391	0.2553	0.1934	0.2292	0.2119	0.1952	0.1888	0.1496	0.1453	0.1479	0.1571	0.1637	0.1734	0.1850	0.1755	0.1478	0.1341	0.1330	0.1298
	NO2	g/vehicle/km	0.0240	0.0232	0.0234	0.0237	0.0239	0.0298	0.0307	0.0288	0.0421	0.0387	0.0351	0.0335	0.0297	0.0285	0.0294	0.0315	0.0330	0.0351	0.0380	0.0360	0.0293	0.0254	0.0249	0.0244
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0018***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0012***	***0.0028***	***0.0053***	***0.0095***	***0.0086***	***0.0072***	***0.0067***	***0.0044***	***0.0040***	***0.0043***	***0.0048***	***0.0053***	***0.0060***	***0.0068***	***0.0062***	***0.0043***	***0.0032***	***0.0029***	***0.0025***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.18E-03	8.24E-04	5.72E-04	4.43E-04	3.73E-04	8.05E-04	1.85E-03	3.56E-03	6.37E-03	5.72E-03	4.81E-03	4.46E-03	2.94E-03	2.67E-03	2.89E-03	3.22E-03	3.51E-03	4.01E-03	4.52E-03	4.12E-03	2.84E-03	2.11E-03	1.96E-03	1.69E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.92E-04	4.12E-04	2.86E-04	2.22E-04	1.87E-04	4.02E-04	9.24E-04	1.78E-03	3.18E-03	2.86E-03	2.41E-03	2.23E-03	1.47E-03	1.34E-03	1.44E-03	1.61E-03	1.76E-03	2.00E-03	2.26E-03	2.06E-03	1.42E-03	1.06E-03	9.79E-04	8.43E-04
	Emission in each Box of 1st jet	g/s	1.18E-04	8.24E-05	5.72E-05	4.43E-05	3.73E-05	8.05E-05	1.85E-04	3.56E-04	6.37E-04	5.72E-04	4.81E-04	4.46E-04	2.94E-04	2.67E-04	2.89E-04	3.22E-04	3.51E-04	4.01E-04	4.52E-04	4.12E-04	2.84E-04	2.11E-04	1.96E-04	1.69E-04
	Emission in each Box of 2nd jet	g/s	5.92E-05	4.12E-05	2.86E-05	2.22E-05	1.87E-05	4.02E-05	9.24E-05	1.78E-04	3.18E-04	2.86E-04	2.41E-04	2.23E-04	1.47E-04	1.34E-04	1.44E-04	1.61E-04	1.76E-04	2.00E-04	2.26E-04	2.06E-04	1.42E-04	1.06E-04	9.79E-05	8.43E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0016***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0012***	***0.0014***	***0.0013***	***0.0008***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.03E-04	1.59E-04	1.10E-04	8.27E-05	6.89E-05	1.00E-04	2.23E-04	5.30E-04	1.17E-03	1.04E-03	8.64E-04	7.92E-04	5.83E-04	5.23E-04	5.74E-04	6.46E-04	7.07E-04	8.12E-04	9.27E-04	8.44E-04	5.64E-04	4.00E-04	3.67E-04	3.17E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.01E-04	7.95E-05	5.48E-05	4.13E-05	3.45E-05	5.02E-05	1.11E-04	2.65E-04	5.84E-04	5.21E-04	4.32E-04	3.96E-04	2.91E-04	2.62E-04	2.87E-04	3.23E-04	3.53E-04	4.06E-04	4.63E-04	4.22E-04	2.82E-04	2.00E-04	1.83E-04	1.58E-04
	Emission in each Box of 1st jet	g/s	2.03E-05	1.59E-05	1.10E-05	8.27E-06	6.89E-06	1.00E-05	2.23E-05	5.30E-05	1.17E-04	1.04E-04	8.64E-05	7.92E-05	5.83E-05	5.23E-05	5.74E-05	6.46E-05	7.07E-05	8.12E-05	9.27E-05	8.44E-05	5.64E-05	4.00E-05	3.67E-05	3.17E-05
	Emission in each Box of 2nd jet	g/s	1.01E-05	7.95E-06	5.48E-06	4.13E-06	3.45E-06	5.02E-06	1.11E-05	2.65E-05	5.84E-05	5.21E-05	4.32E-05	3.96E-05	2.91E-05	2.62E-05	2.87E-05	3.23E-05	3.53E-05	4.06E-05	4.63E-05	4.22E-05	2.82E-05	2.00E-05	1.83E-05	1.58E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1310	0.1106	0.1125	0.1184	0.1207	0.2233	0.2362	0.1805	0.2119	0.1933	0.1794	0.1736	0.1374	0.1345	0.1380	0.1453	0.1511	0.1609	0.1715	0.1640	0.1379	0.1254	0.1228	0.1197
	NO2	g/vehicle/km	0.0226	0.0217	0.0219	0.0223	0.0225	0.0280	0.0287	0.0271	0.0392	0.0357	0.0325	0.0311	0.0275	0.0266	0.0277	0.0294	0.0308	0.0330	0.0356	0.0339	0.0276	0.0240	0.0233	0.0228
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0017***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0011***	***0.0026***	***0.0050***	***0.0088***	***0.0078***	***0.0066***	***0.0061***	***0.0040***	***0.0037***	***0.0040***	***0.0045***	***0.0049***	***0.0056***	***0.0063***	***0.0058***	***0.0040***	***0.0030***	***0.0027***	***0.0023***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.10E-03	7.60E-04	5.26E-04	4.13E-04	3.47E-04	7.52E-04	1.71E-03	3.33E-03	5.88E-03	5.21E-03	4.42E-03	4.10E-03	2.70E-03	2.47E-03	2.69E-03	2.98E-03	3.24E-03	3.72E-03	4.19E-03	3.85E-03	2.65E-03	1.97E-03	1.81E-03	1.56E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.52E-04	3.80E-04	2.63E-04	2.06E-04	1.74E-04	3.76E-04	8.55E-04	1.66E-03	2.94E-03	2.61E-03	2.21E-03	2.05E-03	1.35E-03	1.24E-03	1.35E-03	1.49E-03	1.62E-03	1.86E-03	2.09E-03	1.92E-03	1.33E-03	9.87E-04	9.04E-04	7.78E-04
	Emission in each Box of 1st jet	g/s	1.10E-04	7.60E-05	5.26E-05	4.13E-05	3.47E-05	7.52E-05	1.71E-04	3.33E-04	5.88E-04	5.21E-04	4.42E-04	4.10E-04	2.70E-04	2.47E-04	2.69E-04	2.98E-04	3.24E-04	3.72E-04	4.19E-04	3.85E-04	2.65E-04	1.97E-04	1.81E-04	1.56E-04
	Emission in each Box of 2nd jet	g/s	5.52E-05	3.80E-05	2.63E-05	2.06E-05	1.74E-05	3.76E-05	8.55E-05	1.66E-04	2.94E-04	2.61E-04	2.21E-04	2.05E-04	1.35E-04	1.24E-04	1.35E-04	1.49E-04	1.62E-04	1.86E-04	2.09E-04	1.92E-04	1.33E-04	9.87E-05	9.04E-05	7.78E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0014***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.91E-04	1.49E-04	1.02E-04	7.79E-05	6.48E-05	9.43E-05	2.07E-04	4.99E-04	1.09E-03	9.64E-04	8.02E-04	7.34E-04	5.40E-04	4.89E-04	5.40E-04	6.02E-04	6.59E-04	7.62E-04	8.69E-04	7.96E-04	5.31E-04	3.77E-04	3.43E-04	2.96E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.53E-05	7.44E-05	5.11E-05	3.89E-05	3.24E-05	4.71E-05	1.04E-04	2.49E-04	5.45E-04	4.82E-04	4.01E-04	3.67E-04	2.70E-04	2.44E-04	2.70E-04	3.01E-04	3.30E-04	3.81E-04	4.35E-04	3.98E-04	2.66E-04	1.88E-04	1.71E-04	1.48E-04
	Emission in each Box of 1st jet	g/s	1.91E-05	1.49E-05	1.02E-05	7.79E-06	6.48E-06	9.43E-06	2.07E-05	4.99E-05	1.09E-04	9.64E-05	8.02E-05	7.34E-05	5.40E-05	4.89E-05	5.40E-05	6.02E-05	6.59E-05	7.62E-05	8.69E-05	7.96E-05	5.31E-05	3.77E-05	3.43E-05	2.96E-05
	Emission in each Box of 2nd jet	g/s	9.53E-06	7.44E-06	5.11E-06	3.89E-06	3.24E-06	4.71E-06	1.04E-05	2.49E-05	5.45E-05	4.82E-05	4.01E-05	3.67E-05	2.70E-05	2.44E-05	2.70E-05	3.01E-05	3.30E-05	3.81E-05	4.35E-05	3.98E-05	2.66E-05	1.88E-05	1.71E-05	1.48E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1233	0.1043	0.1062	0.1101	0.1122	0.2089	0.2215	0.1694	0.1995	0.1838	0.1685	0.1654	0.1308	0.1260	0.1294	0.1380	0.1419	0.1519	0.1630	0.1544	0.1293	0.1175	0.1150	0.1124
	NO2	g/vehicle/km	0.0214	0.0206	0.0208	0.0210	0.0212	0.0264	0.0270	0.0256	0.0372	0.0341	0.0308	0.0297	0.0263	0.0251	0.0261	0.0280	0.0290	0.0313	0.0340	0.0322	0.0261	0.0226	0.0219	0.0215
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0007***	***0.0006***	***0.0005***	***0.0011***	***0.0024***	***0.0047***	***0.0083***	***0.0074***	***0.0062***	***0.0059***	***0.0039***	***0.0035***	***0.0038***	***0.0042***	***0.0046***	***0.0053***	***0.0060***	***0.0054***	***0.0037***	***0.0028***	***0.0025***	***0.0022***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.04E-03	7.16E-04	4.97E-04	3.84E-04	3.23E-04	7.03E-04	1.60E-03	3.12E-03	5.54E-03	4.96E-03	4.15E-03	3.90E-03	2.57E-03	2.32E-03	2.52E-03	2.83E-03	3.04E-03	3.51E-03	3.98E-03	3.62E-03	2.49E-03	1.85E-03	1.69E-03	1.46E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.20E-04	3.58E-04	2.48E-04	1.92E-04	1.62E-04	3.52E-04	8.02E-04	1.56E-03	2.77E-03	2.48E-03	2.08E-03	1.95E-03	1.28E-03	1.16E-03	1.26E-03	1.41E-03	1.52E-03	1.75E-03	1.99E-03	1.81E-03	1.24E-03	9.25E-04	8.47E-04	7.30E-04
	Emission in each Box of 1st jet	g/s	1.04E-04	7.16E-05	4.97E-05	3.84E-05	3.23E-05	7.03E-05	1.60E-04	3.12E-04	5.54E-04	4.96E-04	4.15E-04	3.90E-04	2.57E-04	2.32E-04	2.52E-04	2.83E-04	3.04E-04	3.51E-04	3.98E-04	3.62E-04	2.49E-04	1.85E-04	1.69E-04	1.46E-04
	Emission in each Box of 2nd jet	g/s	5.20E-05	3.58E-05	2.48E-05	1.92E-05	1.62E-05	3.52E-05	8.02E-05	1.56E-04	2.77E-04	2.48E-04	2.08E-04	1.95E-04	1.28E-04	1.16E-04	1.26E-04	1.41E-04	1.52E-04	1.75E-04	1.99E-04	1.81E-04	1.24E-04	9.25E-05	8.47E-05	7.30E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0011***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0008***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.81E-04	1.41E-04	9.74E-05	7.33E-05	6.10E-05	8.88E-05	1.96E-04	4.72E-04	1.03E-03	9.19E-04	7.58E-04	7.01E-04	5.17E-04	4.61E-04	5.09E-04	5.74E-04	6.22E-04	7.23E-04	8.29E-04	7.54E-04	5.02E-04	3.56E-04	3.23E-04	2.79E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.04E-05	7.07E-05	4.87E-05	3.66E-05	3.05E-05	4.44E-05	9.79E-05	2.36E-04	5.16E-04	4.60E-04	3.79E-04	3.51E-04	2.58E-04	2.31E-04	2.55E-04	2.87E-04	3.11E-04	3.62E-04	4.15E-04	3.77E-04	2.51E-04	1.78E-04	1.62E-04	1.40E-04
	Emission in each Box of 1st jet	g/s	1.81E-05	1.41E-05	9.74E-06	7.33E-06	6.10E-06	8.88E-06	1.96E-05	4.72E-05	1.03E-04	9.19E-05	7.58E-05	7.01E-05	5.17E-05	4.61E-05	5.09E-05	5.74E-05	6.22E-05	7.23E-05	8.29E-05	7.54E-05	5.02E-05	3.56E-05	3.23E-05	2.79E-05
	Emission in each Box of 2nd jet	g/s	9.04E-06	7.07E-06	4.87E-06	3.66E-06	3.05E-06	4.44E-06	9.79E-06	2.36E-05	5.16E-05	4.60E-05	3.79E-05	3.51E-05	2.58E-05	2.31E-05	2.55E-05	2.87E-05	3.11E-05	3.62E-05	4.15E-05	3.77E-05	2.51E-05	1.78E-05	1.62E-05	1.40E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1156	0.0976	0.0989	0.1052	0.1073	0.2008	0.2130	0.1612	0.1898	0.1750	0.1603	0.1571	0.1242	0.1216	0.1250	0.1308	0.1374	0.1444	0.1550	0.1461	0.1224	0.1132	0.1102	0.1073
	NO2	g/vehicle/km	0.0203	0.0194	0.0196	0.0202	0.0204	0.0254	0.0261	0.0244	0.0355	0.0326	0.0293	0.0283	0.0251	0.0243	0.0253	0.0267	0.0282	0.0298	0.0325	0.0305	0.0249	0.0219	0.0211	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0010***	***0.0023***	***0.0045***	***0.0079***	***0.0071***	***0.0059***	***0.0056***	***0.0037***	***0.0034***	***0.0037***	***0.0040***	***0.0044***	***0.0050***	***0.0057***	***0.0051***	***0.0035***	***0.0027***	***0.0024***	***0.0021***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.75E-04	6.70E-04	4.63E-04	3.66E-04	3.09E-04	6.76E-04	1.54E-03	2.97E-03	5.27E-03	4.72E-03	3.95E-03	3.71E-03	2.44E-03	2.24E-03	2.44E-03	2.68E-03	2.95E-03	3.34E-03	3.78E-03	3.43E-03	2.36E-03	1.78E-03	1.62E-03	1.39E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.88E-04	3.35E-04	2.31E-04	1.83E-04	1.54E-04	3.38E-04	7.71E-04	1.49E-03	2.64E-03	2.36E-03	1.98E-03	1.85E-03	1.22E-03	1.12E-03	1.22E-03	1.34E-03	1.47E-03	1.67E-03	1.89E-03	1.71E-03	1.18E-03	8.90E-04	8.12E-04	6.97E-04
	Emission in each Box of 1st jet	g/s	9.75E-05	6.70E-05	4.63E-05	3.66E-05	3.09E-05	6.76E-05	1.54E-04	2.97E-04	5.27E-04	4.72E-04	3.95E-04	3.71E-04	2.44E-04	2.24E-04	2.44E-04	2.68E-04	2.95E-04	3.34E-04	3.78E-04	3.43E-04	2.36E-04	1.78E-04	1.62E-04	1.39E-04
	Emission in each Box of 2nd jet	g/s	4.88E-05	3.35E-05	2.31E-05	1.83E-05	1.54E-05	3.38E-05	7.71E-05	1.49E-04	2.64E-04	2.36E-04	1.98E-04	1.85E-04	1.22E-04	1.12E-04	1.22E-04	1.34E-04	1.47E-04	1.67E-04	1.89E-04	1.71E-04	1.18E-04	8.90E-05	8.12E-05	6.97E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0013***	***0.0011***	***0.0010***	***0.0007***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.71E-04	1.34E-04	9.17E-05	7.05E-05	5.86E-05	8.56E-05	1.89E-04	4.50E-04	9.87E-04	8.79E-04	7.23E-04	6.69E-04	4.93E-04	4.47E-04	4.93E-04	5.47E-04	6.04E-04	6.89E-04	7.93E-04	7.16E-04	4.78E-04	3.44E-04	3.11E-04	2.68E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.54E-05	6.68E-05	4.58E-05	3.52E-05	2.93E-05	4.28E-05	9.44E-05	2.25E-04	4.93E-04	4.40E-04	3.61E-04	3.34E-04	2.46E-04	2.23E-04	2.46E-04	2.73E-04	3.02E-04	3.45E-04	3.96E-04	3.58E-04	2.39E-04	1.72E-04	1.56E-04	1.34E-04
	Emission in each Box of 1st jet	g/s	1.71E-05	1.34E-05	9.17E-06	7.05E-06	5.86E-06	8.56E-06	1.89E-05	4.50E-05	9.87E-05	8.79E-05	7.23E-05	6.69E-05	4.93E-05	4.47E-05	4.93E-05	5.47E-05	6.04E-05	6.89E-05	7.93E-05	7.16E-05	4.78E-05	3.44E-05	3.11E-05	2.68E-05
	Emission in each Box of 2nd jet	g/s	8.54E-06	6.68E-06	4.58E-06	3.52E-06	2.93E-06	4.28E-06	9.44E-06	2.25E-05	4.93E-05	4.40E-05	3.61E-05	3.34E-05	2.46E-05	2.23E-05	2.46E-05	2.73E-05	3.02E-05	3.45E-05	3.96E-05	3.58E-05	2.39E-05	1.72E-05	1.56E-05	1.34E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104C01-104C20
Enclosure Involvec: 104P3
Road Located: 089
Vehicle EF Adopte: 104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1037	0.0868	0.0884	0.0914	0.0932	0.1750	0.1834	0.1397	0.1669	0.1531	0.1426	0.1394	0.1109	0.1082	0.1119	0.1166	0.1221	0.1302	0.1363	0.1308	0.1093	0.0981	0.0963	0.0936
	NO2	g/vehicle/km	0.0183	0.0175	0.0177	0.0178	0.0180	0.0224	0.0227	0.0213	0.0315	0.0287	0.0262	0.0253	0.0226	0.0218	0.0228	0.0239	0.0252	0.0270	0.0287	0.0275	0.0224	0.0192	0.0187	0.0182
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0039***	***0.0070***	***0.0062***	***0.0053***	***0.0049***	***0.0033***	***0.0030***	***0.0033***	***0.0036***	***0.0039***	***0.0045***	***0.0050***	***0.0046***	***0.0032***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.75E-04	5.96E-04	4.14E-04	3.18E-04	2.68E-04	5.89E-04	1.33E-03	2.58E-03	4.64E-03	4.13E-03	3.51E-03	3.29E-03	2.18E-03	1.99E-03	2.18E-03	2.39E-03	2.62E-03	3.01E-03	3.33E-03	3.07E-03	2.10E-03	1.54E-03	1.42E-03	1.22E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.37E-04	2.98E-04	2.07E-04	1.59E-04	1.34E-04	2.94E-04	6.64E-04	1.29E-03	2.32E-03	2.06E-03	1.76E-03	1.64E-03	1.09E-03	9.94E-04	1.09E-03	1.19E-03	1.31E-03	1.50E-03	1.66E-03	1.53E-03	1.05E-03	7.72E-04	7.09E-04	6.08E-04
	Emission in each Box of 1st jet	g/s	8.75E-05	5.96E-05	4.14E-05	3.18E-05	2.68E-05	5.89E-05	1.33E-04	2.58E-04	4.64E-04	4.13E-04	3.51E-04	3.29E-04	2.18E-04	1.99E-04	2.18E-04	2.39E-04	2.62E-04	3.01E-04	3.33E-04	3.07E-04	2.10E-04	1.54E-04	1.42E-04	1.22E-04
	Emission in each Box of 2nd jet	g/s	4.37E-05	2.98E-05	2.07E-05	1.59E-05	1.34E-05	2.94E-05	6.64E-05	1.29E-04	2.32E-04	2.06E-04	1.76E-04	1.64E-04	1.09E-04	9.94E-05	1.09E-04	1.19E-04	1.31E-04	1.50E-04	1.66E-04	1.53E-04	1.05E-04	7.72E-05	7.09E-05	6.08E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0007***	***0.0006***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0011***	***0.0010***	***0.0006***	***0.0005***	***0.0004***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-04	1.20E-04	8.28E-05	6.21E-05	5.17E-05	7.53E-05	1.64E-04	3.93E-04	8.74E-04	7.74E-04	6.46E-04	5.97E-04	4.43E-04	4.00E-04	4.44E-04	4.90E-04	5.40E-04	6.25E-04	7.01E-04	6.46E-04	4.30E-04	3.02E-04	2.75E-04	2.37E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.72E-05	6.01E-05	4.14E-05	3.11E-05	2.59E-05	3.77E-05	8.21E-05	1.97E-04	4.37E-04	3.87E-04	3.23E-04	2.99E-04	2.21E-04	2.00E-04	2.22E-04	2.45E-04	2.70E-04	3.13E-04	3.51E-04	3.23E-04	2.15E-04	1.51E-04	1.38E-04	1.18E-04
	Emission in each Box of 1st jet	g/s	1.54E-05	1.20E-05	8.28E-06	6.21E-06	5.17E-06	7.53E-06	1.64E-05	3.93E-05	8.74E-05	7.74E-05	6.46E-05	5.97E-05	4.43E-05	4.00E-05	4.44E-05	4.90E-05	5.40E-05	6.25E-05	7.01E-05	6.46E-05	4.30E-05	3.02E-05	2.75E-05	2.37E-05
	Emission in each Box of 2nd jet	g/s	7.72E-06	6.01E-06	4.14E-06	3.11E-06	2.59E-06	3.77E-06	8.21E-06	1.97E-05	4.37E-05	3.87E-05	3.23E-05	2.99E-05	2.21E-05	2.00E-05	2.22E-05	2.45E-05	2.70E-05	3.13E-05	3.51E-05	3.23E-05	2.15E-05	1.51E-05	1.38E-05	1.18E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involved	104P3
Road Located	089
Vehicle EF Adopted	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1000	0.0841	0.0878	0.0908	0.0921	0.1731	0.1791	0.1379	0.1632	0.1527	0.1379	0.1348	0.1065	0.1045	0.1067	0.1127	0.1200	0.1269	0.1336	0.1292	0.1080	0.0975	0.0952	0.0930
	NO2	g/vehicle/km	0.0177	0.0170	0.0176	0.0177	0.0178	0.0221	0.0222	0.0211	0.0309	0.0286	0.0255	0.0246	0.0218	0.0211	0.0218	0.0232	0.0248	0.0265	0.0282	0.0273	0.0221	0.0191	0.0185	0.0181
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0019***	***0.0038***	***0.0068***	***0.0062***	***0.0051***	***0.0048***	***0.0031***	***0.0029***	***0.0031***	***0.0035***	***0.0039***	***0.0044***	***0.0049***	***0.0045***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.43E-04	5.78E-04	4.11E-04	3.16E-04	2.65E-04	5.83E-04	1.30E-03	2.54E-03	4.53E-03	4.12E-03	3.40E-03	3.18E-03	2.09E-03	1.92E-03	2.08E-03	2.31E-03	2.57E-03	2.93E-03	3.26E-03	3.03E-03	2.08E-03	1.53E-03	1.40E-03	1.21E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.22E-04	2.89E-04	2.06E-04	1.58E-04	1.33E-04	2.91E-04	6.48E-04	1.27E-03	2.27E-03	2.06E-03	1.70E-03	1.59E-03	1.04E-03	9.61E-04	1.04E-03	1.15E-03	1.29E-03	1.47E-03	1.63E-03	1.52E-03	1.04E-03	7.67E-04	7.01E-04	6.04E-04
	Emission in each Box of 1st jet	g/s	8.43E-05	5.78E-05	4.11E-05	3.16E-05	2.65E-05	5.83E-05	1.30E-04	2.54E-04	4.53E-04	4.12E-04	3.40E-04	3.18E-04	2.09E-04	1.92E-04	2.08E-04	2.31E-04	2.57E-04	2.93E-04	3.26E-04	3.03E-04	2.08E-04	1.53E-04	1.40E-04	1.21E-04
	Emission in each Box of 2nd jet	g/s	4.22E-05	2.89E-05	2.06E-05	1.58E-05	1.33E-05	2.91E-05	6.48E-05	1.27E-04	2.27E-04	2.06E-04	1.70E-04	1.59E-04	1.04E-04	9.61E-05	1.04E-04	1.15E-04	1.29E-04	1.47E-04	1.63E-04	1.52E-04	1.04E-04	7.67E-05	7.01E-05	6.04E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0012***	***0.0009***	***0.0009***	***0.0006***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0010***	***0.0006***	***0.0005***	***0.0004***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.49E-04	1.17E-04	8.23E-05	6.18E-05	5.12E-05	7.45E-05	1.61E-04	3.89E-04	8.57E-04	7.72E-04	6.28E-04	5.80E-04	4.27E-04	3.88E-04	4.25E-04	4.76E-04	5.32E-04	6.11E-04	6.89E-04	6.39E-04	4.26E-04	3.00E-04	2.72E-04	2.35E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.47E-05	5.84E-05	4.12E-05	3.09E-05	2.56E-05	3.73E-05	8.03E-05	1.95E-04	4.28E-04	3.86E-04	3.14E-04	2.90E-04	2.13E-04	1.94E-04	2.13E-04	2.38E-04	2.66E-04	3.06E-04	3.45E-04	3.20E-04	2.13E-04	1.50E-04	1.36E-04	1.18E-04
	Emission in each Box of 1st jet	g/s	1.49E-05	1.17E-05	8.23E-06	6.18E-06	5.12E-06	7.45E-06	1.61E-05	3.89E-05	8.57E-05	7.72E-05	6.28E-05	5.80E-05	4.27E-05	3.88E-05	4.25E-05	4.76E-05	5.32E-05	6.11E-05	6.89E-05	6.39E-05	4.26E-05	3.00E-05	2.72E-05	2.35E-05
	Emission in each Box of 2nd jet	g/s	7.47E-06	5.84E-06	4.12E-06	3.09E-06	2.56E-06	3.73E-06	8.03E-06	1.95E-05	4.28E-05	3.86E-05	3.14E-05	2.90E-05	2.13E-05	1.94E-05	2.13E-05	2.38E-05	2.66E-05	3.06E-05	3.45E-05	3.20E-05	2.13E-05	1.50E-05	1.36E-05	1.18E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involved	104P3
Road Located	089
Vehicle EF Adopted	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1006	0.0836	0.0851	0.0879	0.0897	0.1676	0.1791	0.1345	0.1592	0.1476	0.1386	0.1364	0.1045	0.1027	0.1080	0.1133	0.1179	0.1266	0.1322	0.1278	0.1060	0.0963	0.0940	0.0906
	NO2	g/vehicle/km	0.0178	0.0169	0.0171	0.0172	0.0174	0.0215	0.0222	0.0206	0.0301	0.0277	0.0256	0.0248	0.0214	0.0208	0.0220	0.0233	0.0244	0.0264	0.0279	0.0270	0.0218	0.0189	0.0183	0.0177
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0008***	***0.0019***	***0.0037***	***0.0066***	***0.0060***	***0.0051***	***0.0048***	***0.0031***	***0.0028***	***0.0032***	***0.0035***	***0.0038***	***0.0044***	***0.0048***	***0.0045***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.49E-04	5.74E-04	3.98E-04	3.06E-04	2.58E-04	5.64E-04	1.30E-03	2.48E-03	4.42E-03	3.98E-03	3.41E-03	3.22E-03	2.05E-03	1.89E-03	2.11E-03	2.32E-03	2.53E-03	2.92E-03	3.23E-03	3.00E-03	2.04E-03	1.52E-03	1.38E-03	1.18E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.24E-04	2.87E-04	1.99E-04	1.53E-04	1.29E-04	2.82E-04	6.48E-04	1.24E-03	2.21E-03	1.99E-03	1.71E-03	1.61E-03	1.03E-03	9.44E-04	1.05E-03	1.16E-03	1.26E-03	1.46E-03	1.61E-03	1.50E-03	1.02E-03	7.58E-04	6.92E-04	5.88E-04
	Emission in each Box of 1st jet	g/s	8.49E-05	5.74E-05	3.98E-05	3.06E-05	2.58E-05	5.64E-05	1.30E-04	2.48E-04	4.42E-04	3.98E-04	3.41E-04	3.22E-04	2.05E-04	1.89E-04	2.11E-04	2.32E-04	2.53E-04	2.92E-04	3.23E-04	3.00E-04	2.04E-04	1.52E-04	1.38E-04	1.18E-04
	Emission in each Box of 2nd jet	g/s	4.24E-05	2.87E-05	1.99E-05	1.53E-05	1.29E-05	2.82E-05	6.48E-05	1.24E-04	2.21E-04	1.99E-04	1.71E-04	1.61E-04	1.03E-04	9.44E-05	1.05E-04	1.16E-04	1.26E-04	1.46E-04	1.61E-04	1.50E-04	1.02E-04	7.58E-05	6.92E-05	5.88E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0011***	***0.0009***	***0.0009***	***0.0006***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.50E-04	1.16E-04	8.00E-05	6.00E-05	5.00E-05	7.24E-05	1.61E-04	3.80E-04	8.36E-04	7.48E-04	6.30E-04	5.86E-04	4.20E-04	3.82E-04	4.30E-04	4.78E-04	5.23E-04	6.09E-04	6.82E-04	6.33E-04	4.19E-04	2.97E-04	2.69E-04	2.30E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.51E-05	5.81E-05	4.00E-05	3.00E-05	2.50E-05	3.62E-05	8.03E-05	1.90E-04	4.18E-04	3.74E-04	3.15E-04	2.93E-04	2.10E-04	1.91E-04	2.15E-04	2.39E-04	2.62E-04	3.05E-04	3.41E-04	3.16E-04	2.09E-04	1.48E-04	1.34E-04	1.15E-04
	Emission in each Box of 1st jet	g/s	1.50E-05	1.16E-05	8.00E-06	6.00E-06	5.00E-06	7.24E-06	1.61E-05	3.80E-05	8.36E-05	7.48E-05	6.30E-05	5.86E-05	4.20E-05	3.82E-05	4.30E-05	4.78E-05	5.23E-05	6.09E-05	6.82E-05	6.33E-05	4.19E-05	2.97E-05	2.69E-05	2.30E-05
	Emission in each Box of 2nd jet	g/s	7.51E-06	5.81E-06	4.00E-06	3.00E-06	2.50E-06	3.62E-06	8.03E-06	1.90E-05	4.18E-05	3.74E-05	3.15E-05	2.93E-05	2.10E-05	1.91E-05	2.15E-05	2.39E-05	2.62E-05	3.05E-05	3.41E-05	3.16E-05	2.09E-05	1.48E-05	1.34E-05	1.15E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1020	0.0853	0.0868	0.0898	0.0916	0.1711	0.1827	0.1379	0.1611	0.1481	0.1408	0.1366	0.1065	0.1045	0.1074	0.1127	0.1208	0.1261	0.1360	0.1277	0.1062	0.0963	0.0940	0.0918
	NO2	g/vehicle/km	0.0180	0.0172	0.0174	0.0176	0.0177	0.0219	0.0226	0.0211	0.0304	0.0278	0.0260	0.0249	0.0218	0.0211	0.0220	0.0232	0.0250	0.0263	0.0287	0.0270	0.0217	0.0189	0.0183	0.0179
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0038***	***0.0067***	***0.0060***	***0.0052***	***0.0048***	***0.0031***	***0.0029***	***0.0031***	***0.0035***	***0.0039***	***0.0044***	***0.0050***	***0.0045***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.60E-04	5.86E-04	4.06E-04	3.13E-04	2.64E-04	5.76E-04	1.32E-03	2.54E-03	4.47E-03	3.99E-03	3.47E-03	3.22E-03	2.09E-03	1.92E-03	2.09E-03	2.31E-03	2.59E-03	2.91E-03	3.32E-03	3.00E-03	2.04E-03	1.52E-03	1.38E-03	1.19E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.30E-04	2.93E-04	2.03E-04	1.56E-04	1.32E-04	2.88E-04	6.61E-04	1.27E-03	2.24E-03	2.00E-03	1.74E-03	1.61E-03	1.04E-03	9.61E-04	1.05E-03	1.15E-03	1.29E-03	1.46E-03	1.66E-03	1.50E-03	1.02E-03	7.58E-04	6.92E-04	5.97E-04
	Emission in each Box of 1st jet	g/s	8.60E-05	5.86E-05	4.06E-05	3.13E-05	2.64E-05	5.76E-05	1.32E-04	2.54E-04	4.47E-04	3.99E-04	3.47E-04	3.22E-04	2.09E-04	1.92E-04	2.09E-04	2.31E-04	2.59E-04	2.91E-04	3.32E-04	3.00E-04	2.04E-04	1.52E-04	1.38E-04	1.19E-04
	Emission in each Box of 2nd jet	g/s	4.30E-05	2.93E-05	2.03E-05	1.56E-05	1.32E-05	2.88E-05	6.61E-05	1.27E-04	2.24E-04	2.00E-04	1.74E-04	1.61E-04	1.04E-04	9.61E-05	1.05E-04	1.15E-04	1.29E-04	1.46E-04	1.66E-04	1.50E-04	1.02E-04	7.58E-05	6.92E-05	5.97E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0011***	***0.0010***	***0.0009***	***0.0006***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0009***	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.52E-04	1.18E-04	8.15E-05	6.12E-05	5.09E-05	7.38E-05	1.64E-04	3.89E-04	8.45E-04	7.51E-04	6.40E-04	5.87E-04	4.27E-04	3.88E-04	4.28E-04	4.76E-04	5.35E-04	6.08E-04	7.01E-04	6.33E-04	4.18E-04	2.97E-04	2.69E-04	2.33E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.61E-05	5.92E-05	4.07E-05	3.06E-05	2.55E-05	3.69E-05	8.18E-05	1.95E-04	4.23E-04	3.75E-04	3.20E-04	2.94E-04	2.13E-04	1.94E-04	2.14E-04	2.38E-04	2.68E-04	3.04E-04	3.50E-04	3.16E-04	2.09E-04	1.48E-04	1.34E-04	1.16E-04
	Emission in each Box of 1st jet	g/s	1.52E-05	1.18E-05	8.15E-06	6.12E-06	5.09E-06	7.38E-06	1.64E-05	3.89E-05	8.45E-05	7.51E-05	6.40E-05	5.87E-05	4.27E-05	3.88E-05	4.28E-05	4.76E-05	5.35E-05	6.08E-05	7.01E-05	6.33E-05	4.18E-05	2.97E-05	2.69E-05	2.33E-05
	Emission in each Box of 2nd jet	g/s	7.61E-06	5.92E-06	4.07E-06	3.06E-06	2.55E-06	3.69E-06	8.18E-06	1.95E-05	4.23E-05	3.75E-05	3.20E-05	2.94E-05	2.13E-05	1.94E-05	2.14E-05	2.38E-05	2.68E-05	3.04E-05	3.50E-05	3.16E-05	2.09E-05	1.48E-05	1.34E-05	1.16E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1013	0.0847	0.0861	0.0885	0.0932	0.1740	0.1847	0.1362	0.1625	0.1498	0.1426	0.1365	0.1079	0.1074	0.1096	0.1158	0.1196	0.1257	0.1353	0.1261	0.1093	0.0987	0.0963	0.0941
	NO2	g/vehicle/km	0.0179	0.0171	0.0173	0.0173	0.0180	0.0223	0.0228	0.0209	0.0307	0.0281	0.0262	0.0248	0.0220	0.0216	0.0223	0.0238	0.0247	0.0262	0.0286	0.0266	0.0224	0.0193	0.0187	0.0183
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0038***	***0.0068***	***0.0061***	***0.0053***	***0.0048***	***0.0032***	***0.0030***	***0.0032***	***0.0036***	***0.0038***	***0.0044***	***0.0050***	***0.0044***	***0.0032***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.54E-04	5.81E-04	4.03E-04	3.08E-04	2.68E-04	5.86E-04	1.34E-03	2.51E-03	4.51E-03	4.04E-03	3.51E-03	3.22E-03	2.12E-03	1.97E-03	2.14E-03	2.37E-03	2.56E-03	2.90E-03	3.31E-03	2.96E-03	2.10E-03	1.55E-03	1.42E-03	1.22E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.27E-04	2.91E-04	2.02E-04	1.54E-04	1.34E-04	2.93E-04	6.69E-04	1.25E-03	2.26E-03	2.02E-03	1.76E-03	1.61E-03	1.06E-03	9.87E-04	1.07E-03	1.19E-03	1.28E-03	1.45E-03	1.65E-03	1.48E-03	1.05E-03	7.77E-04	7.09E-04	6.11E-04
	Emission in each Box of 1st jet	g/s	8.54E-05	5.81E-05	4.03E-05	3.08E-05	2.68E-05	5.86E-05	1.34E-04	2.51E-04	4.51E-04	4.04E-04	3.51E-04	3.22E-04	2.12E-04	1.97E-04	2.14E-04	2.37E-04	2.56E-04	2.90E-04	3.31E-04	2.96E-04	2.10E-04	1.55E-04	1.42E-04	1.22E-04
	Emission in each Box of 2nd jet	g/s	4.27E-05	2.91E-05	2.02E-05	1.54E-05	1.34E-05	2.93E-05	6.69E-05	1.25E-04	2.26E-04	2.02E-04	1.76E-04	1.61E-04	1.06E-04	9.87E-05	1.07E-04	1.19E-04	1.28E-04	1.45E-04	1.65E-04	1.48E-04	1.05E-04	7.77E-05	7.09E-05	6.11E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0011***	***0.0010***	***0.0009***	***0.0006***	***0.0006***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.51E-04	1.17E-04	8.09E-05	6.04E-05	5.17E-05	7.49E-05	1.65E-04	3.84E-04	8.53E-04	7.58E-04	6.46E-04	5.86E-04	4.31E-04	3.97E-04	4.36E-04	4.87E-04	5.30E-04	6.05E-04	6.97E-04	6.25E-04	4.30E-04	3.04E-04	2.75E-04	2.38E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.55E-05	5.87E-05	4.04E-05	3.02E-05	2.59E-05	3.75E-05	8.26E-05	1.92E-04	4.27E-04	3.79E-04	3.23E-04	2.93E-04	2.16E-04	1.99E-04	2.18E-04	2.44E-04	2.65E-04	3.03E-04	3.49E-04	3.13E-04	2.15E-04	1.52E-04	1.38E-04	1.19E-04
	Emission in each Box of 1st jet	g/s	1.51E-05	1.17E-05	8.09E-06	6.04E-06	5.17E-06	7.49E-06	1.65E-05	3.84E-05	8.53E-05	7.58E-05	6.46E-05	5.86E-05	4.31E-05	3.97E-05	4.36E-05	4.87E-05	5.30E-05	6.05E-05	6.97E-05	6.25E-05	4.30E-05	3.04E-05	2.75E-05	2.38E-05
	Emission in each Box of 2nd jet	g/s	7.55E-06	5.87E-06	4.04E-06	3.02E-06	2.59E-06	3.75E-06	8.26E-06	1.92E-05	4.27E-05	3.79E-05	3.23E-05	2.93E-05	2.16E-05	1.99E-05	2.18E-05	2.44E-05	2.65E-05	3.03E-05	3.49E-05	3.13E-05	2.15E-05	1.52E-05	1.38E-05	1.19E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involved	104P3
Road Located	089
Vehicle EF Adopted	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1145	0.0966	0.0979	0.1014	0.1030	0.1925	0.2052	0.1567	0.1845	0.1700	0.1556	0.1525	0.1212	0.1181	0.1214	0.1276	0.1336	0.1401	0.1519	0.1437	0.1210	0.1099	0.1074	0.1044
	NO2	g/vehicle/km	0.0201	0.0193	0.0194	0.0196	0.0196	0.0245	0.0252	0.0238	0.0346	0.0317	0.0285	0.0276	0.0245	0.0236	0.0245	0.0261	0.0274	0.0290	0.0318	0.0301	0.0245	0.0213	0.0207	0.0202
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0010***	***0.0022***	***0.0043***	***0.0077***	***0.0069***	***0.0057***	***0.0054***	***0.0036***	***0.0033***	***0.0036***	***0.0039***	***0.0043***	***0.0049***	***0.0056***	***0.0051***	***0.0035***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.66E-04	6.63E-04	4.58E-04	3.53E-04	2.97E-04	6.48E-04	1.48E-03	2.89E-03	5.12E-03	4.59E-03	3.83E-03	3.60E-03	2.38E-03	2.17E-03	2.37E-03	2.61E-03	2.86E-03	3.24E-03	3.71E-03	3.37E-03	2.33E-03	1.73E-03	1.58E-03	1.36E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.83E-04	3.32E-04	2.29E-04	1.77E-04	1.48E-04	3.24E-04	7.42E-04	1.44E-03	2.56E-03	2.29E-03	1.92E-03	1.80E-03	1.19E-03	1.09E-03	1.18E-03	1.31E-03	1.43E-03	1.62E-03	1.85E-03	1.69E-03	1.16E-03	8.65E-04	7.91E-04	6.78E-04
	Emission in each Box of 1st jet	g/s	9.66E-05	6.63E-05	4.58E-05	3.53E-05	2.97E-05	6.48E-05	1.48E-04	2.89E-04	5.12E-04	4.59E-04	3.83E-04	3.60E-04	2.38E-04	2.17E-04	2.37E-04	2.61E-04	2.86E-04	3.24E-04	3.71E-04	3.37E-04	2.33E-04	1.73E-04	1.58E-04	1.36E-04
	Emission in each Box of 2nd jet	g/s	4.83E-05	3.32E-05	2.29E-05	1.77E-05	1.48E-05	3.24E-05	7.42E-05	1.44E-04	2.56E-04	2.29E-04	1.92E-04	1.80E-04	1.19E-04	1.09E-04	1.18E-04	1.31E-04	1.43E-04	1.62E-04	1.85E-04	1.69E-04	1.16E-04	8.65E-05	7.91E-05	6.78E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0014***	***0.0013***	***0.0011***	***0.0010***	***0.0007***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.69E-04	1.33E-04	9.09E-05	6.83E-05	5.65E-05	8.25E-05	1.83E-04	4.39E-04	9.61E-04	8.54E-04	7.03E-04	6.51E-04	4.80E-04	4.34E-04	4.79E-04	5.34E-04	5.88E-04	6.71E-04	7.77E-04	7.06E-04	4.72E-04	3.35E-04	3.04E-04	2.62E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.47E-05	6.63E-05	4.54E-05	3.42E-05	2.82E-05	4.12E-05	9.13E-05	2.19E-04	4.81E-04	4.27E-04	3.51E-04	3.25E-04	2.40E-04	2.17E-04	2.39E-04	2.67E-04	2.94E-04	3.35E-04	3.88E-04	3.53E-04	2.36E-04	1.68E-04	1.52E-04	1.31E-04
	Emission in each Box of 1st jet	g/s	1.69E-05	1.33E-05	9.09E-06	6.83E-06	5.65E-06	8.25E-06	1.83E-05	4.39E-05	9.61E-05	8.54E-05	7.03E-05	6.51E-05	4.80E-05	4.34E-05	4.79E-05	5.34E-05	5.88E-05	6.71E-05	7.77E-05	7.06E-05	4.72E-05	3.35E-05	3.04E-05	2.62E-05
	Emission in each Box of 2nd jet	g/s	8.47E-06	6.63E-06	4.54E-06	3.42E-06	2.82E-06	4.12E-06	9.13E-06	2.19E-05	4.81E-05	4.27E-05	3.51E-05	3.25E-05	2.40E-05	2.17E-05	2.39E-05	2.67E-05	2.94E-05	3.35E-05	3.88E-05	3.53E-05	2.36E-05	1.68E-05	1.52E-05	1.31E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1259	0.1077	0.1095	0.1145	0.1167	0.2175	0.2313	0.1764	0.2083	0.1925	0.1761	0.1716	0.1346	0.1313	0.1348	0.1418	0.1476	0.1576	0.1675	0.1609	0.1348	0.1224	0.1198	0.1171
	NO2	g/vehicle/km	0.0219	0.0212	0.0214	0.0218	0.0219	0.0274	0.0282	0.0266	0.0387	0.0355	0.0320	0.0308	0.0270	0.0260	0.0271	0.0288	0.0301	0.0324	0.0348	0.0334	0.0271	0.0235	0.0228	0.0224
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0011***	***0.0025***	***0.0049***	***0.0087***	***0.0078***	***0.0065***	***0.0061***	***0.0040***	***0.0036***	***0.0039***	***0.0044***	***0.0047***	***0.0055***	***0.0061***	***0.0057***	***0.0039***	***0.0029***	***0.0026***	***0.0023***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.06E-03	7.40E-04	5.12E-04	3.99E-04	3.36E-04	7.32E-04	1.67E-03	3.25E-03	5.78E-03	5.19E-03	4.34E-03	4.05E-03	2.64E-03	2.41E-03	2.63E-03	2.91E-03	3.16E-03	3.64E-03	4.09E-03	3.77E-03	2.59E-03	1.93E-03	1.76E-03	1.52E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.31E-04	3.70E-04	2.56E-04	1.99E-04	1.68E-04	3.66E-04	8.37E-04	1.63E-03	2.89E-03	2.60E-03	2.17E-03	2.02E-03	1.32E-03	1.21E-03	1.32E-03	1.45E-03	1.58E-03	1.82E-03	2.05E-03	1.89E-03	1.30E-03	9.63E-04	8.82E-04	7.61E-04
	Emission in each Box of 1st jet	g/s	1.06E-04	7.40E-05	5.12E-05	3.99E-05	3.36E-05	7.32E-05	1.67E-04	3.25E-04	5.78E-04	5.19E-04	4.34E-04	4.05E-04	2.64E-04	2.41E-04	2.63E-04	2.91E-04	3.16E-04	3.64E-04	4.09E-04	3.77E-04	2.59E-04	1.93E-04	1.76E-04	1.52E-04
	Emission in each Box of 2nd jet	g/s	5.31E-05	3.70E-05	2.56E-05	1.99E-05	1.68E-05	3.66E-05	8.37E-05	1.63E-04	2.89E-04	2.60E-04	2.17E-04	2.02E-04	1.32E-04	1.21E-04	1.32E-04	1.45E-04	1.58E-04	1.82E-04	2.05E-04	1.89E-04	1.30E-04	9.63E-05	8.82E-05	7.61E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0014***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.84E-04	1.46E-04	1.00E-04	7.59E-05	6.31E-05	9.21E-05	2.04E-04	4.89E-04	1.08E-03	9.59E-04	7.89E-04	7.27E-04	5.30E-04	4.78E-04	5.28E-04	5.90E-04	6.46E-04	7.48E-04	8.50E-04	7.83E-04	5.21E-04	3.70E-04	3.36E-04	2.91E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.21E-05	7.28E-05	5.00E-05	3.79E-05	3.16E-05	4.61E-05	1.02E-04	2.45E-04	5.38E-04	4.80E-04	3.95E-04	3.63E-04	2.65E-04	2.39E-04	2.64E-04	2.95E-04	3.23E-04	3.74E-04	4.25E-04	3.92E-04	2.60E-04	1.85E-04	1.68E-04	1.45E-04
	Emission in each Box of 1st jet	g/s	1.84E-05	1.46E-05	1.00E-05	7.59E-06	6.31E-06	9.21E-06	2.04E-05	4.89E-05	1.08E-04	9.59E-05	7.89E-05	7.27E-05	5.30E-05	4.78E-05	5.28E-05	5.90E-05	6.46E-05	7.48E-05	8.50E-05	7.83E-05	5.21E-05	3.70E-05	3.36E-05	2.91E-05
	Emission in each Box of 2nd jet	g/s	9.21E-06	7.28E-06	5.00E-06	3.79E-06	3.16E-06	4.61E-06	1.02E-05	2.45E-05	5.38E-05	4.80E-05	3.95E-05	3.63E-05	2.65E-05	2.39E-05	2.64E-05	2.95E-05	3.23E-05	3.74E-05	4.25E-05	3.92E-05	2.60E-05	1.85E-05	1.68E-05	1.45E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	501	408	278	207	171	200	430	1095	1650	1603	1464	1402	1166	1092	1159	1217	1274	1373	1451	1394	1143	935	875	772
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1332	0.1131	0.1149	0.1195	0.1234	0.2281	0.2418	0.1844	0.2175	0.2008	0.1831	0.1787	0.1399	0.1364	0.1406	0.1476	0.1535	0.1635	0.1756	0.1664	0.1401	0.1270	0.1260	0.1232
	NO2	g/vehicle/km	0.0230	0.0221	0.0223	0.0226	0.0230	0.0286	0.0293	0.0276	0.0402	0.0369	0.0331	0.0319	0.0280	0.0270	0.0281	0.0298	0.0312	0.0334	0.0363	0.0344	0.0280	0.0242	0.0238	0.0233
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0026***	***0.0051***	***0.0091***	***0.0081***	***0.0068***	***0.0063***	***0.0041***	***0.0038***	***0.0041***	***0.0045***	***0.0049***	***0.0057***	***0.0064***	***0.0059***	***0.0040***	***0.0030***	***0.0028***	***0.0024***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.12E-03	7.77E-04	5.38E-04	4.16E-04	3.55E-04	7.68E-04	1.75E-03	3.40E-03	6.04E-03	5.42E-03	4.51E-03	4.22E-03	2.74E-03	2.51E-03	2.74E-03	3.02E-03	3.29E-03	3.78E-03	4.29E-03	3.91E-03	2.69E-03	2.00E-03	1.86E-03	1.60E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.61E-04	3.88E-04	2.69E-04	2.08E-04	1.78E-04	3.84E-04	8.75E-04	1.70E-03	3.02E-03	2.71E-03	2.26E-03	2.11E-03	1.37E-03	1.25E-03	1.37E-03	1.51E-03	1.65E-03	1.89E-03	2.14E-03	1.95E-03	1.35E-03	9.99E-04	9.28E-04	8.00E-04
	Emission in each Box of 1st jet	g/s	1.12E-04	7.77E-05	5.38E-05	4.16E-05	3.55E-05	7.68E-05	1.75E-04	3.40E-04	6.04E-04	5.42E-04	4.51E-04	4.22E-04	2.74E-04	2.51E-04	2.74E-04	3.02E-04	3.29E-04	3.78E-04	4.29E-04	3.91E-04	2.69E-04	2.00E-04	1.86E-04	1.60E-04
	Emission in each Box of 2nd jet	g/s	5.61E-05	3.88E-05	2.69E-05	2.08E-05	1.78E-05	3.84E-05	8.75E-05	1.70E-04	3.02E-04	2.71E-04	2.26E-04	2.11E-04	1.37E-04	1.25E-04	1.37E-04	1.51E-04	1.65E-04	1.89E-04	2.14E-04	1.95E-04	1.35E-04	9.99E-05	9.28E-05	8.00E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0015***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0012***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.94E-04	1.52E-04	1.04E-04	7.87E-05	6.61E-05	9.62E-05	2.12E-04	5.09E-04	1.12E-03	9.95E-04	8.17E-04	7.54E-04	5.50E-04	4.96E-04	5.49E-04	6.11E-04	6.68E-04	7.72E-04	8.86E-04	8.07E-04	5.39E-04	3.81E-04	3.50E-04	3.03E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.68E-05	7.58E-05	5.21E-05	3.93E-05	3.30E-05	4.81E-05	1.06E-04	2.54E-04	5.58E-04	4.97E-04	4.08E-04	3.77E-04	2.75E-04	2.48E-04	2.74E-04	3.05E-04	3.34E-04	3.86E-04	4.43E-04	4.04E-04	2.69E-04	1.91E-04	1.75E-04	1.51E-04
	Emission in each Box of 1st jet	g/s	1.94E-05	1.52E-05	1.04E-05	7.87E-06	6.61E-06	9.62E-06	2.12E-05	5.09E-05	1.12E-04	9.95E-05	8.17E-05	7.54E-05	5.50E-05	4.96E-05	5.49E-05	6.11E-05	6.68E-05	7.72E-05	8.86E-05	8.07E-05	5.39E-05	3.81E-05	3.50E-05	3.03E-05
	Emission in each Box of 2nd jet	g/s	9.68E-06	7.58E-06	5.21E-06	3.93E-06	3.30E-06	4.81E-06	1.06E-05	2.54E-05	5.58E-05	4.97E-05	4.08E-05	3.77E-05	2.75E-05	2.48E-05	2.74E-05	3.05E-05	3.34E-05	3.86E-05	4.43E-05	4.04E-05	2.69E-05	1.91E-05	1.75E-05	1.51E-05
RSP Emission Rate		g/s	***1.15E-04***	***7.84E-05***	***5.47E-05***	***4.23E-05***	***3.58E-05***	***7.93E-05***	***1.81E-04***	***3.37E-04***	***5.12E-04***	***4.71E-04***	***4.09E-04***	***3.86E-04***	***2.56E-04***	***2.39E-04***	***2.55E-04***	***2.76E-04***	***2.96E-04***	***3.31E-04***	***3.67E-04***	***3.38E-04***	***2.51E-04***	***2.00E-04***	***1.87E-04***	***1.61E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.66E-05	5.23E-05	3.65E-05	2.82E-05	2.39E-05	5.29E-05	1.21E-04	2.24E-04	3.41E-04	3.14E-04	2.73E-04	2.57E-04	1.71E-04	1.60E-04	1.70E-04	1.84E-04	1.98E-04	2.21E-04	2.45E-04	2.25E-04	1.67E-04	1.34E-04	1.25E-04	1.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.83E-05	2.61E-05	1.82E-05	1.41E-05	1.19E-05	2.64E-05	6.03E-05	1.12E-04	1.71E-04	1.57E-04	1.36E-04	1.29E-04	8.53E-05	7.98E-05	8.50E-05	9.21E-05	9.88E-05	1.10E-04	1.22E-04	1.13E-04	8.36E-05	6.68E-05	6.24E-05	5.36E-05
	Emission in each Box of 1st jet	g/s	7.66E-06	5.23E-06	3.65E-06	2.82E-06	2.39E-06	5.29E-06	1.21E-05	2.24E-05	3.41E-05	3.14E-05	2.73E-05	2.57E-05	1.71E-05	1.60E-05	1.70E-05	1.84E-05	1.98E-05	2.21E-05	2.45E-05	2.25E-05	1.67E-05	1.34E-05	1.25E-05	1.07E-05
	Emission in each Box of 2nd jet	g/s	3.83E-06	2.61E-06	1.82E-06	1.41E-06	1.19E-06	2.64E-06	6.03E-06	1.12E-05	1.71E-05	1.57E-05	1.36E-05	1.29E-05	8.53E-06	7.98E-06	8.50E-06	9.21E-06	9.88E-06	1.10E-05	1.22E-05	1.13E-05	8.36E-06	6.68E-06	6.24E-06	5.36E-06
FSP Emission Rate		g/s	***1.06E-04***	***7.22E-05***	***5.04E-05***	***3.89E-05***	***3.27E-05***	***7.30E-05***	***1.66E-04***	***3.10E-04***	***4.71E-04***	***4.33E-04***	***3.76E-04***	***3.54E-04***	***2.36E-04***	***2.19E-04***	***2.35E-04***	***2.53E-04***	***2.72E-04***	***3.06E-04***	***3.37E-04***	***3.10E-04***	***2.31E-04***	***1.85E-04***	***1.71E-04***	***1.48E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.05E-05	4.81E-05	3.36E-05	2.60E-05	2.18E-05	4.87E-05	1.11E-04	2.06E-04	3.14E-04	2.89E-04	2.50E-04	2.36E-04	1.57E-04	1.46E-04	1.57E-04	1.69E-04	1.81E-04	2.04E-04	2.25E-04	2.07E-04	1.54E-04	1.23E-04	1.14E-04	9.88E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.53E-05	2.41E-05	1.68E-05	1.30E-05	1.09E-05	2.43E-05	5.55E-05	1.03E-04	1.57E-04	1.44E-04	1.25E-04	1.18E-04	7.87E-05	7.30E-05	7.84E-05	8.45E-05	9.06E-05	1.02E-04	1.12E-04	1.03E-04	7.71E-05	6.16E-05	5.70E-05	4.94E-05
	Emission in each Box of 1st jet	g/s	7.05E-06	4.81E-06	3.36E-06	2.60E-06	2.18E-06	4.87E-06	1.11E-05	2.06E-05	3.14E-05	2.89E-05	2.50E-05	2.36E-05	1.57E-05	1.46E-05	1.57E-05	1.69E-05	1.81E-05	2.04E-05	2.25E-05	2.07E-05	1.54E-05	1.23E-05	1.14E-05	9.88E-06
	Emission in each Box of 2nd jet	g/s	3.53E-06	2.41E-06	1.68E-06	1.30E-06	1.09E-06	2.43E-06	5.55E-06	1.03E-05	1.57E-05	1.44E-05	1.25E-05	1.18E-05	7.87E-06	7.30E-06	7.84E-06	8.45E-06	9.06E-06	1.02E-05	1.12E-05	1.03E-05	7.71E-06	6.16E-06	5.70E-06	4.94E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1405	0.1200	0.1223	0.1272	0.1298	0.2391	0.2553	0.1934	0.2292	0.2119	0.1952	0.1888	0.1496	0.1453	0.1479	0.1571	0.1637	0.1734	0.1850	0.1755	0.1478	0.1341	0.1330	0.1298
	NO2	g/vehicle/km	0.0240	0.0232	0.0234	0.0237	0.0239	0.0298	0.0307	0.0288	0.0421	0.0387	0.0351	0.0335	0.0297	0.0285	0.0294	0.0315	0.0330	0.0351	0.0380	0.0360	0.0293	0.0254	0.0249	0.0244
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0039***	***0.0069***	***0.0062***	***0.0052***	***0.0049***	***0.0026***	***0.0024***	***0.0025***	***0.0028***	***0.0031***	***0.0035***	***0.0040***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.54E-04	5.98E-04	4.16E-04	3.21E-04	2.73E-04	6.04E-04	1.38E-03	2.61E-03	4.63E-03	4.16E-03	3.50E-03	3.24E-03	1.73E-03	1.57E-03	1.70E-03	1.89E-03	2.06E-03	2.35E-03	2.65E-03	2.41E-03	1.67E-03	1.25E-03	1.16E-03	9.87E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.27E-04	2.99E-04	2.08E-04	1.61E-04	1.37E-04	3.02E-04	6.90E-04	1.31E-03	2.31E-03	2.08E-03	1.75E-03	1.62E-03	8.64E-04	7.85E-04	8.48E-04	9.45E-04	1.03E-03	1.17E-03	1.32E-03	1.20E-03	8.36E-04	6.25E-04	5.78E-04	4.94E-04
	Emission in each Box of 1st jet	g/s	8.54E-05	5.98E-05	4.16E-05	3.21E-05	2.73E-05	6.04E-05	1.38E-04	2.61E-04	4.63E-04	4.16E-04	3.50E-04	3.24E-04	1.73E-04	1.57E-04	1.70E-04	1.89E-04	2.06E-04	2.35E-04	2.65E-04	2.41E-04	1.67E-04	1.25E-04	1.16E-04	9.87E-05
	Emission in each Box of 2nd jet	g/s	4.27E-05	2.99E-05	2.08E-05	1.61E-05	1.37E-05	3.02E-05	6.90E-05	1.31E-04	2.31E-04	2.08E-04	1.75E-04	1.62E-04	8.64E-05	7.85E-05	8.48E-05	9.45E-05	1.03E-04	1.17E-04	1.32E-04	1.20E-04	8.36E-05	6.25E-05	5.78E-05	4.94E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0011***	***0.0009***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.46E-04	1.15E-04	7.96E-05	5.99E-05	5.04E-05	7.53E-05	1.66E-04	3.89E-04	8.50E-04	7.59E-04	6.28E-04	5.76E-04	3.43E-04	3.08E-04	3.37E-04	3.79E-04	4.15E-04	4.76E-04	5.44E-04	4.94E-04	3.32E-04	2.37E-04	2.16E-04	1.86E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.30E-05	5.77E-05	3.98E-05	3.00E-05	2.52E-05	3.76E-05	8.31E-05	1.95E-04	4.25E-04	3.79E-04	3.14E-04	2.88E-04	1.71E-04	1.54E-04	1.69E-04	1.90E-04	2.07E-04	2.38E-04	2.72E-04	2.47E-04	1.66E-04	1.18E-04	1.08E-04	9.28E-05
	Emission in each Box of 1st jet	g/s	1.46E-05	1.15E-05	7.96E-06	5.99E-06	5.04E-06	7.53E-06	1.66E-05	3.89E-05	8.50E-05	7.59E-05	6.28E-05	5.76E-05	3.43E-05	3.08E-05	3.37E-05	3.79E-05	4.15E-05	4.76E-05	5.44E-05	4.94E-05	3.32E-05	2.37E-05	2.16E-05	1.86E-05
	Emission in each Box of 2nd jet	g/s	7.30E-06	5.77E-06	3.98E-06	3.00E-06	2.52E-06	3.76E-06	8.31E-06	1.95E-05	4.25E-05	3.79E-05	3.14E-05	2.88E-05	1.71E-05	1.54E-05	1.69E-05	1.90E-05	2.07E-05	2.38E-05	2.72E-05	2.47E-05	1.66E-05	1.18E-05	1.08E-05	9.28E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1310	0.1106	0.1125	0.1184	0.1207	0.2233	0.2362	0.1805	0.2119	0.1933	0.1794	0.1736	0.1374	0.1345	0.1380	0.1453	0.1511	0.1609	0.1715	0.1640	0.1379	0.1254	0.1228	0.1197
	NO2	g/vehicle/km	0.0226	0.0217	0.0219	0.0223	0.0225	0.0280	0.0287	0.0271	0.0392	0.0357	0.0325	0.0311	0.0275	0.0266	0.0277	0.0294	0.0308	0.0330	0.0356	0.0339	0.0276	0.0240	0.0233	0.0228
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0012***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0008***	***0.0019***	***0.0037***	***0.0064***	***0.0057***	***0.0048***	***0.0045***	***0.0024***	***0.0022***	***0.0024***	***0.0026***	***0.0029***	***0.0033***	***0.0037***	***0.0034***	***0.0023***	***0.0018***	***0.0016***	***0.0014***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.96E-04	5.51E-04	3.82E-04	2.99E-04	2.54E-04	5.64E-04	1.28E-03	2.44E-03	4.28E-03	3.79E-03	3.22E-03	2.98E-03	1.59E-03	1.45E-03	1.58E-03	1.75E-03	1.90E-03	2.18E-03	2.46E-03	2.25E-03	1.56E-03	1.17E-03	1.07E-03	9.11E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.98E-04	2.76E-04	1.91E-04	1.49E-04	1.27E-04	2.82E-04	6.38E-04	1.22E-03	2.14E-03	1.90E-03	1.61E-03	1.49E-03	7.93E-04	7.26E-04	7.91E-04	8.74E-04	9.51E-04	1.09E-03	1.23E-03	1.12E-03	7.80E-04	5.85E-04	5.33E-04	4.55E-04
	Emission in each Box of 1st jet	g/s	7.96E-05	5.51E-05	3.82E-05	2.99E-05	2.54E-05	5.64E-05	1.28E-04	2.44E-04	4.28E-04	3.79E-04	3.22E-04	2.98E-04	1.59E-04	1.45E-04	1.58E-04	1.75E-04	1.90E-04	2.18E-04	2.46E-04	2.25E-04	1.56E-04	1.17E-04	1.07E-04	9.11E-05
	Emission in each Box of 2nd jet	g/s	3.98E-05	2.76E-05	1.91E-05	1.49E-05	1.27E-05	2.82E-05	6.38E-05	1.22E-04	2.14E-04	1.90E-04	1.61E-04	1.49E-04	7.93E-05	7.26E-05	7.91E-05	8.74E-05	9.51E-05	1.09E-04	1.23E-04	1.12E-04	7.80E-05	5.85E-05	5.33E-05	4.55E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.37E-04	1.08E-04	7.43E-05	5.64E-05	4.74E-05	7.07E-05	1.55E-04	3.66E-04	7.93E-04	7.01E-04	5.83E-04	5.34E-04	3.17E-04	2.87E-04	3.18E-04	3.54E-04	3.87E-04	4.46E-04	5.10E-04	4.65E-04	3.12E-04	2.23E-04	2.02E-04	1.73E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.87E-05	5.40E-05	3.72E-05	2.82E-05	2.37E-05	3.54E-05	7.74E-05	1.83E-04	3.96E-04	3.50E-04	2.92E-04	2.67E-04	1.59E-04	1.44E-04	1.59E-04	1.77E-04	1.94E-04	2.23E-04	2.55E-04	2.33E-04	1.56E-04	1.12E-04	1.01E-04	8.66E-05
	Emission in each Box of 1st jet	g/s	1.37E-05	1.08E-05	7.43E-06	5.64E-06	4.74E-06	7.07E-06	1.55E-05	3.66E-05	7.93E-05	7.01E-05	5.83E-05	5.34E-05	3.17E-05	2.87E-05	3.18E-05	3.54E-05	3.87E-05	4.46E-05	5.10E-05	4.65E-05	3.12E-05	2.23E-05	2.02E-05	1.73E-05
	Emission in each Box of 2nd jet	g/s	6.87E-06	5.40E-06	3.72E-06	2.82E-06	2.37E-06	3.54E-06	7.74E-06	1.83E-05	3.96E-05	3.50E-05	2.92E-05	2.67E-05	1.59E-05	1.44E-05	1.59E-05	1.77E-05	1.94E-05	2.23E-05	2.55E-05	2.33E-05	1.56E-05	1.12E-05	1.01E-05	8.66E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1233	0.1043	0.1062	0.1101	0.1122	0.2089	0.2215	0.1694	0.1995	0.1838	0.1685	0.1654	0.1308	0.1260	0.1294	0.1380	0.1419	0.1519	0.1630	0.1544	0.1293	0.1175	0.1150	0.1124
	NO2	g/vehicle/km	0.0214	0.0206	0.0208	0.0210	0.0212	0.0264	0.0270	0.0256	0.0372	0.0341	0.0308	0.0297	0.0263	0.0251	0.0261	0.0280	0.0290	0.0313	0.0340	0.0322	0.0261	0.0226	0.0219	0.0215
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0008***	***0.0018***	***0.0034***	***0.0060***	***0.0054***	***0.0045***	***0.0043***	***0.0023***	***0.0020***	***0.0022***	***0.0025***	***0.0027***	***0.0031***	***0.0035***	***0.0032***	***0.0022***	***0.0016***	***0.0015***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.49E-04	5.19E-04	3.61E-04	2.78E-04	2.36E-04	5.27E-04	1.20E-03	2.29E-03	4.03E-03	3.61E-03	3.02E-03	2.84E-03	1.51E-03	1.36E-03	1.48E-03	1.66E-03	1.79E-03	2.06E-03	2.34E-03	2.12E-03	1.46E-03	1.10E-03	9.99E-04	8.55E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.75E-04	2.60E-04	1.81E-04	1.39E-04	1.18E-04	2.64E-04	5.98E-04	1.14E-03	2.01E-03	1.80E-03	1.51E-03	1.42E-03	7.55E-04	6.81E-04	7.42E-04	8.30E-04	8.93E-04	1.03E-03	1.17E-03	1.06E-03	7.31E-04	5.48E-04	4.99E-04	4.27E-04
	Emission in each Box of 1st jet	g/s	7.49E-05	5.19E-05	3.61E-05	2.78E-05	2.36E-05	5.27E-05	1.20E-04	2.29E-04	4.03E-04	3.61E-04	3.02E-04	2.84E-04	1.51E-04	1.36E-04	1.48E-04	1.66E-04	1.79E-04	2.06E-04	2.34E-04	2.12E-04	1.46E-04	1.10E-04	9.99E-05	8.55E-05
	Emission in each Box of 2nd jet	g/s	3.75E-05	2.60E-05	1.81E-05	1.39E-05	1.18E-05	2.64E-05	5.98E-05	1.14E-04	2.01E-04	1.80E-04	1.51E-04	1.42E-04	7.55E-05	6.81E-05	7.42E-05	8.30E-05	8.93E-05	1.03E-04	1.17E-04	1.06E-04	7.31E-05	5.48E-05	4.99E-05	4.27E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0007***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.30E-04	1.03E-04	7.07E-05	5.31E-05	4.46E-05	6.66E-05	1.46E-04	3.46E-04	7.51E-04	6.69E-04	5.52E-04	5.10E-04	3.04E-04	2.71E-04	2.99E-04	3.37E-04	3.65E-04	4.24E-04	4.86E-04	4.41E-04	2.95E-04	2.11E-04	1.91E-04	1.64E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.51E-05	5.13E-05	3.54E-05	2.65E-05	2.23E-05	3.33E-05	7.31E-05	1.73E-04	3.75E-04	3.34E-04	2.76E-04	2.55E-04	1.52E-04	1.36E-04	1.50E-04	1.69E-04	1.83E-04	2.12E-04	2.43E-04	2.21E-04	1.47E-04	1.05E-04	9.53E-05	8.18E-05
	Emission in each Box of 1st jet	g/s	1.30E-05	1.03E-05	7.07E-06	5.31E-06	4.46E-06	6.66E-06	1.46E-05	3.46E-05	7.51E-05	6.69E-05	5.52E-05	5.10E-05	3.04E-05	2.71E-05	2.99E-05	3.37E-05	3.65E-05	4.24E-05	4.86E-05	4.41E-05	2.95E-05	2.11E-05	1.91E-05	1.64E-05
	Emission in each Box of 2nd jet	g/s	6.51E-06	5.13E-06	3.54E-06	2.65E-06	2.23E-06	3.33E-06	7.31E-06	1.73E-05	3.75E-05	3.34E-05	2.76E-05	2.55E-05	1.52E-05	1.36E-05	1.50E-05	1.69E-05	1.83E-05	2.12E-05	2.43E-05	2.21E-05	1.47E-05	1.05E-05	9.53E-06	8.18E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1156	0.0976	0.0989	0.1052	0.1073	0.2008	0.2130	0.1612	0.1898	0.1750	0.1603	0.1571	0.1242	0.1216	0.1250	0.1308	0.1374	0.1444	0.1550	0.1461	0.1224	0.1132	0.1102	0.1073
	NO2	g/vehicle/km	0.0203	0.0194	0.0196	0.0202	0.0204	0.0254	0.0261	0.0244	0.0355	0.0326	0.0293	0.0283	0.0251	0.0243	0.0253	0.0267	0.0282	0.0298	0.0325	0.0305	0.0249	0.0219	0.0211	0.0206
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0008***	***0.0017***	***0.0033***	***0.0058***	***0.0052***	***0.0043***	***0.0040***	***0.0022***	***0.0020***	***0.0021***	***0.0024***	***0.0026***	***0.0029***	***0.0033***	***0.0030***	***0.0021***	***0.0016***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.03E-04	4.86E-04	3.36E-04	2.66E-04	2.26E-04	5.07E-04	1.15E-03	2.18E-03	3.83E-03	3.43E-03	2.87E-03	2.70E-03	1.43E-03	1.31E-03	1.43E-03	1.57E-03	1.73E-03	1.96E-03	2.22E-03	2.00E-03	1.38E-03	1.06E-03	9.57E-04	8.16E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.51E-04	2.43E-04	1.68E-04	1.33E-04	1.13E-04	2.54E-04	5.76E-04	1.09E-03	1.92E-03	1.72E-03	1.44E-03	1.35E-03	7.17E-04	6.57E-04	7.16E-04	7.87E-04	8.65E-04	9.78E-04	1.11E-03	1.00E-03	6.92E-04	5.28E-04	4.79E-04	4.08E-04
	Emission in each Box of 1st jet	g/s	7.03E-05	4.86E-05	3.36E-05	2.66E-05	2.26E-05	5.07E-05	1.15E-04	2.18E-04	3.83E-04	3.43E-04	2.87E-04	2.70E-04	1.43E-04	1.31E-04	1.43E-04	1.57E-04	1.73E-04	1.96E-04	2.22E-04	2.00E-04	1.38E-04	1.06E-04	9.57E-05	8.16E-05
	Emission in each Box of 2nd jet	g/s	3.51E-05	2.43E-05	1.68E-05	1.33E-05	1.13E-05	2.54E-05	5.76E-05	1.09E-04	1.92E-04	1.72E-04	1.44E-04	1.35E-04	7.17E-05	6.57E-05	7.16E-05	7.87E-05	8.65E-05	9.78E-05	1.11E-04	1.00E-04	6.92E-05	5.28E-05	4.79E-05	4.08E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0007***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.23E-04	9.69E-05	6.66E-05	5.11E-05	4.29E-05	6.42E-05	1.41E-04	3.30E-04	7.18E-04	6.40E-04	5.26E-04	4.86E-04	2.90E-04	2.63E-04	2.90E-04	3.21E-04	3.55E-04	4.04E-04	4.65E-04	4.19E-04	2.81E-04	2.04E-04	1.84E-04	1.57E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.16E-05	4.84E-05	3.33E-05	2.55E-05	2.14E-05	3.21E-05	7.05E-05	1.65E-04	3.59E-04	3.20E-04	2.63E-04	2.43E-04	1.45E-04	1.31E-04	1.45E-04	1.61E-04	1.77E-04	2.02E-04	2.32E-04	2.09E-04	1.41E-04	1.02E-04	9.18E-05	7.85E-05
	Emission in each Box of 1st jet	g/s	1.23E-05	9.69E-06	6.66E-06	5.11E-06	4.29E-06	6.42E-06	1.41E-05	3.30E-05	7.18E-05	6.40E-05	5.26E-05	4.86E-05	2.90E-05	2.63E-05	2.90E-05	3.21E-05	3.55E-05	4.04E-05	4.65E-05	4.19E-05	2.81E-05	2.04E-05	1.84E-05	1.57E-05
	Emission in each Box of 2nd jet	g/s	6.16E-06	4.84E-06	3.33E-06	2.55E-06	2.14E-06	3.21E-06	7.05E-06	1.65E-05	3.59E-05	3.20E-05	2.63E-05	2.43E-05	1.45E-05	1.31E-05	1.45E-05	1.61E-05	1.77E-05	2.02E-05	2.32E-05	2.09E-05	1.41E-05	1.02E-05	9.18E-06	7.85E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1037	0.0868	0.0884	0.0914	0.0932	0.1750	0.1834	0.1397	0.1669	0.1531	0.1426	0.1394	0.1109	0.1082	0.1119	0.1166	0.1221	0.1302	0.1363	0.1308	0.1093	0.0981	0.0963	0.0936
	NO2	g/vehicle/km	0.0183	0.0175	0.0177	0.0178	0.0180	0.0224	0.0227	0.0213	0.0315	0.0287	0.0262	0.0253	0.0226	0.0218	0.0228	0.0239	0.0252	0.0270	0.0287	0.0275	0.0224	0.0192	0.0187	0.0182
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0005***	***0.0003***	***0.0003***	***0.0007***	***0.0015***	***0.0028***	***0.0051***	***0.0045***	***0.0038***	***0.0036***	***0.0019***	***0.0018***	***0.0019***	***0.0021***	***0.0023***	***0.0026***	***0.0029***	***0.0027***	***0.0019***	***0.0014***	***0.0013***	***0.0011***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.30E-04	4.32E-04	3.00E-04	2.31E-04	1.96E-04	4.42E-04	9.91E-04	1.89E-03	3.37E-03	3.00E-03	2.56E-03	2.39E-03	1.28E-03	1.17E-03	1.28E-03	1.40E-03	1.54E-03	1.76E-03	1.95E-03	1.79E-03	1.24E-03	9.15E-04	8.36E-04	7.12E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.15E-04	2.16E-04	1.50E-04	1.15E-04	9.80E-05	2.21E-04	4.95E-04	9.44E-04	1.69E-03	1.50E-03	1.28E-03	1.20E-03	6.40E-04	5.84E-04	6.41E-04	7.02E-04	7.69E-04	8.82E-04	9.76E-04	8.97E-04	6.18E-04	4.57E-04	4.18E-04	3.56E-04
	Emission in each Box of 1st jet	g/s	6.30E-05	4.32E-05	3.00E-05	2.31E-05	1.96E-05	4.42E-05	9.91E-05	1.89E-04	3.37E-04	3.00E-04	2.56E-04	2.39E-04	1.28E-04	1.17E-04	1.28E-04	1.40E-04	1.54E-04	1.76E-04	1.95E-04	1.79E-04	1.24E-04	9.15E-05	8.36E-05	7.12E-05
	Emission in each Box of 2nd jet	g/s	3.15E-05	2.16E-05	1.50E-05	1.15E-05	9.80E-06	2.21E-05	4.95E-05	9.44E-05	1.69E-04	1.50E-04	1.28E-04	1.20E-04	6.40E-05	5.84E-05	6.41E-05	7.02E-05	7.69E-05	8.82E-05	9.76E-05	8.97E-05	6.18E-05	4.57E-05	4.18E-05	3.56E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0008***	***0.0007***	***0.0007***	***0.0004***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.11E-04	8.72E-05	6.01E-05	4.50E-05	3.78E-05	5.65E-05	1.23E-04	2.88E-04	6.36E-04	5.63E-04	4.70E-04	4.35E-04	2.60E-04	2.35E-04	2.61E-04	2.88E-04	3.17E-04	3.66E-04	4.11E-04	3.78E-04	2.53E-04	1.79E-04	1.62E-04	1.38E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.56E-05	4.36E-05	3.01E-05	2.25E-05	1.89E-05	2.82E-05	6.13E-05	1.44E-04	3.18E-04	2.82E-04	2.35E-04	2.17E-04	1.30E-04	1.18E-04	1.30E-04	1.44E-04	1.59E-04	1.83E-04	2.06E-04	1.89E-04	1.26E-04	8.94E-05	8.11E-05	6.92E-05
	Emission in each Box of 1st jet	g/s	1.11E-05	8.72E-06	6.01E-06	4.50E-06	3.78E-06	5.65E-06	1.23E-05	2.88E-05	6.36E-05	5.63E-05	4.70E-05	4.35E-05	2.60E-05	2.35E-05	2.61E-05	2.88E-05	3.17E-05	3.66E-05	4.11E-05	3.78E-05	2.53E-05	1.79E-05	1.62E-05	1.38E-05
	Emission in each Box of 2nd jet	g/s	5.56E-06	4.36E-06	3.01E-06	2.25E-06	1.89E-06	2.82E-06	6.13E-06	1.44E-05	3.18E-05	2.82E-05	2.35E-05	2.17E-05	1.30E-05	1.18E-05	1.30E-05	1.44E-05	1.59E-05	1.83E-05	2.06E-05	1.89E-05	1.26E-05	8.94E-06	8.11E-06	6.92E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1000	0.0841	0.0878	0.0908	0.0921	0.1731	0.1791	0.1379	0.1632	0.1527	0.1379	0.1348	0.1065	0.1045	0.1067	0.1127	0.1200	0.1269	0.1336	0.1292	0.1080	0.0975	0.0952	0.0930
	NO2	g/vehicle/km	0.0177	0.0170	0.0176	0.0177	0.0178	0.0221	0.0222	0.0211	0.0309	0.0286	0.0255	0.0246	0.0218	0.0211	0.0218	0.0232	0.0248	0.0265	0.0282	0.0273	0.0221	0.0191	0.0185	0.0181
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0007***	***0.0015***	***0.0028***	***0.0049***	***0.0045***	***0.0037***	***0.0035***	***0.0018***	***0.0017***	***0.0018***	***0.0020***	***0.0023***	***0.0026***	***0.0029***	***0.0027***	***0.0018***	***0.0014***	***0.0012***	***0.0011***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.08E-04	4.19E-04	2.99E-04	2.29E-04	1.94E-04	4.37E-04	9.68E-04	1.86E-03	3.30E-03	3.00E-03	2.47E-03	2.31E-03	1.23E-03	1.13E-03	1.22E-03	1.36E-03	1.51E-03	1.72E-03	1.91E-03	1.77E-03	1.22E-03	9.09E-04	8.27E-04	7.07E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.04E-04	2.10E-04	1.49E-04	1.15E-04	9.69E-05	2.18E-04	4.84E-04	9.32E-04	1.65E-03	1.50E-03	1.24E-03	1.16E-03	6.15E-04	5.65E-04	6.11E-04	6.78E-04	7.55E-04	8.60E-04	9.57E-04	8.86E-04	6.11E-04	4.55E-04	4.13E-04	3.54E-04
	Emission in each Box of 1st jet	g/s	6.08E-05	4.19E-05	2.99E-05	2.29E-05	1.94E-05	4.37E-05	9.68E-05	1.86E-04	3.30E-04	3.00E-04	2.47E-04	2.31E-04	1.23E-04	1.13E-04	1.22E-04	1.36E-04	1.51E-04	1.72E-04	1.91E-04	1.77E-04	1.22E-04	9.09E-05	8.27E-05	7.07E-05
	Emission in each Box of 2nd jet	g/s	3.04E-05	2.10E-05	1.49E-05	1.15E-05	9.69E-06	2.18E-05	4.84E-05	9.32E-05	1.65E-04	1.50E-04	1.24E-04	1.16E-04	6.15E-05	5.65E-05	6.11E-05	6.78E-05	7.55E-05	8.60E-05	9.57E-05	8.86E-05	6.11E-05	4.55E-05	4.13E-05	3.54E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.08E-04	8.48E-05	5.98E-05	4.48E-05	3.74E-05	5.59E-05	1.20E-04	2.85E-04	6.23E-04	5.62E-04	4.57E-04	4.22E-04	2.51E-04	2.28E-04	2.50E-04	2.80E-04	3.13E-04	3.58E-04	4.04E-04	3.74E-04	2.51E-04	1.78E-04	1.60E-04	1.38E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.38E-05	4.24E-05	2.99E-05	2.24E-05	1.87E-05	2.80E-05	5.99E-05	1.43E-04	3.12E-04	2.81E-04	2.29E-04	2.11E-04	1.26E-04	1.14E-04	1.25E-04	1.40E-04	1.56E-04	1.79E-04	2.02E-04	1.87E-04	1.25E-04	8.89E-05	8.02E-05	6.89E-05
	Emission in each Box of 1st jet	g/s	1.08E-05	8.48E-06	5.98E-06	4.48E-06	3.74E-06	5.59E-06	1.20E-05	2.85E-05	6.23E-05	5.62E-05	4.57E-05	4.22E-05	2.51E-05	2.28E-05	2.50E-05	2.80E-05	3.13E-05	3.58E-05	4.04E-05	3.74E-05	2.51E-05	1.78E-05	1.60E-05	1.38E-05
	Emission in each Box of 2nd jet	g/s	5.38E-06	4.24E-06	2.99E-06	2.24E-06	1.87E-06	2.80E-06	5.99E-06	1.43E-05	3.12E-05	2.81E-05	2.29E-05	2.11E-05	1.26E-05	1.14E-05	1.25E-05	1.40E-05	1.56E-05	1.79E-05	2.02E-05	1.87E-05	1.25E-05	8.89E-06	8.02E-06	6.89E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1006	0.0836	0.0851	0.0879	0.0897	0.1676	0.1791	0.1345	0.1592	0.1476	0.1386	0.1364	0.1045	0.1027	0.1080	0.1133	0.1179	0.1266	0.1322	0.1278	0.1060	0.0963	0.0940	0.0906
	NO2	g/vehicle/km	0.0178	0.0169	0.0171	0.0172	0.0174	0.0215	0.0222	0.0206	0.0301	0.0277	0.0256	0.0248	0.0214	0.0208	0.0220	0.0233	0.0244	0.0264	0.0279	0.0270	0.0218	0.0189	0.0183	0.0177
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0006***	***0.0015***	***0.0027***	***0.0048***	***0.0043***	***0.0037***	***0.0035***	***0.0018***	***0.0017***	***0.0019***	***0.0020***	***0.0022***	***0.0026***	***0.0028***	***0.0026***	***0.0018***	***0.0013***	***0.0012***	***0.0010***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.12E-04	4.17E-04	2.89E-04	2.22E-04	1.89E-04	4.23E-04	9.68E-04	1.82E-03	3.22E-03	2.90E-03	2.48E-03	2.34E-03	1.21E-03	1.11E-03	1.24E-03	1.36E-03	1.48E-03	1.71E-03	1.89E-03	1.75E-03	1.20E-03	8.98E-04	8.16E-04	6.89E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.06E-04	2.08E-04	1.45E-04	1.11E-04	9.43E-05	2.12E-04	4.84E-04	9.09E-04	1.61E-03	1.45E-03	1.24E-03	1.17E-03	6.03E-04	5.55E-04	6.19E-04	6.82E-04	7.42E-04	8.57E-04	9.47E-04	8.76E-04	6.00E-04	4.49E-04	4.08E-04	3.44E-04
	Emission in each Box of 1st jet	g/s	6.12E-05	4.17E-05	2.89E-05	2.22E-05	1.89E-05	4.23E-05	9.68E-05	1.82E-04	3.22E-04	2.90E-04	2.48E-04	2.34E-04	1.21E-04	1.11E-04	1.24E-04	1.36E-04	1.48E-04	1.71E-04	1.89E-04	1.75E-04	1.20E-04	8.98E-05	8.16E-05	6.89E-05
	Emission in each Box of 2nd jet	g/s	3.06E-05	2.08E-05	1.45E-05	1.11E-05	9.43E-06	2.12E-05	4.84E-05	9.09E-05	1.61E-04	1.45E-04	1.24E-04	1.17E-04	6.03E-05	5.55E-05	6.19E-05	6.82E-05	7.42E-05	8.57E-05	9.47E-05	8.76E-05	6.00E-05	4.49E-05	4.08E-05	3.44E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.08E-04	8.43E-05	5.81E-05	4.35E-05	3.65E-05	5.43E-05	1.20E-04	2.79E-04	6.08E-04	5.44E-04	4.59E-04	4.26E-04	2.47E-04	2.24E-04	2.53E-04	2.81E-04	3.07E-04	3.57E-04	4.00E-04	3.70E-04	2.46E-04	1.76E-04	1.59E-04	1.35E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.41E-05	4.22E-05	2.91E-05	2.18E-05	1.83E-05	2.72E-05	5.99E-05	1.39E-04	3.04E-04	2.72E-04	2.29E-04	2.13E-04	1.23E-04	1.12E-04	1.26E-04	1.40E-04	1.54E-04	1.79E-04	2.00E-04	1.85E-04	1.23E-04	8.79E-05	7.93E-05	6.73E-05
	Emission in each Box of 1st jet	g/s	1.08E-05	8.43E-06	5.81E-06	4.35E-06	3.65E-06	5.43E-06	1.20E-05	2.79E-05	6.08E-05	5.44E-05	4.59E-05	4.26E-05	2.47E-05	2.24E-05	2.53E-05	2.81E-05	3.07E-05	3.57E-05	4.00E-05	3.70E-05	2.46E-05	1.76E-05	1.59E-05	1.35E-05
	Emission in each Box of 2nd jet	g/s	5.41E-06	4.22E-06	2.91E-06	2.18E-06	1.83E-06	2.72E-06	5.99E-06	1.39E-05	3.04E-05	2.72E-05	2.29E-05	2.13E-05	1.23E-05	1.12E-05	1.26E-05	1.40E-05	1.54E-05	1.79E-05	2.00E-05	1.85E-05	1.23E-05	8.79E-06	7.93E-06	6.73E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1020	0.0853	0.0868	0.0898	0.0916	0.1711	0.1827	0.1379	0.1611	0.1481	0.1408	0.1366	0.1065	0.1045	0.1074	0.1127	0.1208	0.1261	0.1360	0.1277	0.1062	0.0963	0.0940	0.0918
	NO2	g/vehicle/km	0.0180	0.0172	0.0174	0.0176	0.0177	0.0219	0.0226	0.0211	0.0304	0.0278	0.0260	0.0249	0.0218	0.0211	0.0220	0.0232	0.0250	0.0263	0.0287	0.0270	0.0217	0.0189	0.0183	0.0179
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0006***	***0.0015***	***0.0028***	***0.0049***	***0.0044***	***0.0038***	***0.0035***	***0.0018***	***0.0017***	***0.0018***	***0.0020***	***0.0023***	***0.0026***	***0.0029***	***0.0026***	***0.0018***	***0.0013***	***0.0012***	***0.0010***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.20E-04	4.25E-04	2.95E-04	2.27E-04	1.93E-04	4.32E-04	9.87E-04	1.86E-03	3.25E-03	2.91E-03	2.52E-03	2.35E-03	1.23E-03	1.13E-03	1.23E-03	1.36E-03	1.52E-03	1.71E-03	1.95E-03	1.75E-03	1.20E-03	8.98E-04	8.16E-04	6.99E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.10E-04	2.12E-04	1.48E-04	1.13E-04	9.63E-05	2.16E-04	4.94E-04	9.32E-04	1.63E-03	1.45E-03	1.26E-03	1.17E-03	6.15E-04	5.65E-04	6.15E-04	6.78E-04	7.60E-04	8.54E-04	9.74E-04	8.76E-04	6.00E-04	4.49E-04	4.08E-04	3.49E-04
	Emission in each Box of 1st jet	g/s	6.20E-05	4.25E-05	2.95E-05	2.27E-05	1.93E-05	4.32E-05	9.87E-05	1.86E-04	3.25E-04	2.91E-04	2.52E-04	2.35E-04	1.23E-04	1.13E-04	1.23E-04	1.36E-04	1.52E-04	1.71E-04	1.95E-04	1.75E-04	1.20E-04	8.98E-05	8.16E-05	6.99E-05
	Emission in each Box of 2nd jet	g/s	3.10E-05	2.12E-05	1.48E-05	1.13E-05	9.63E-06	2.16E-05	4.94E-05	9.32E-05	1.63E-04	1.45E-04	1.26E-04	1.17E-04	6.15E-05	5.65E-05	6.15E-05	6.78E-05	7.60E-05	8.54E-05	9.74E-05	8.76E-05	6.00E-05	4.49E-05	4.08E-05	3.49E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.10E-04	8.59E-05	5.92E-05	4.44E-05	3.72E-05	5.53E-05	1.22E-04	2.85E-04	6.15E-04	5.46E-04	4.65E-04	4.27E-04	2.51E-04	2.28E-04	2.52E-04	2.80E-04	3.14E-04	3.56E-04	4.11E-04	3.70E-04	2.46E-04	1.76E-04	1.59E-04	1.36E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.48E-05	4.29E-05	2.96E-05	2.22E-05	1.86E-05	2.77E-05	6.10E-05	1.43E-04	3.07E-04	2.73E-04	2.33E-04	2.14E-04	1.26E-04	1.14E-04	1.26E-04	1.40E-04	1.57E-04	1.78E-04	2.06E-04	1.85E-04	1.23E-04	8.80E-05	7.93E-05	6.81E-05
	Emission in each Box of 1st jet	g/s	1.10E-05	8.59E-06	5.92E-06	4.44E-06	3.72E-06	5.53E-06	1.22E-05	2.85E-05	6.15E-05	5.46E-05	4.65E-05	4.27E-05	2.51E-05	2.28E-05	2.52E-05	2.80E-05	3.14E-05	3.56E-05	4.11E-05	3.70E-05	2.46E-05	1.76E-05	1.59E-05	1.36E-05
	Emission in each Box of 2nd jet	g/s	5.48E-06	4.29E-06	2.96E-06	2.22E-06	1.86E-06	2.77E-06	6.10E-06	1.43E-05	3.07E-05	2.73E-05	2.33E-05	2.14E-05	1.26E-05	1.14E-05	1.26E-05	1.40E-05	1.57E-05	1.78E-05	2.06E-05	1.85E-05	1.23E-05	8.80E-06	7.93E-06	6.81E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1013	0.0847	0.0861	0.0885	0.0932	0.1740	0.1847	0.1362	0.1625	0.1498	0.1426	0.1365	0.1079	0.1074	0.1096	0.1158	0.1196	0.1257	0.1353	0.1261	0.1093	0.0987	0.0963	0.0941
	NO2	g/vehicle/km	0.0179	0.0171	0.0173	0.0173	0.0180	0.0223	0.0228	0.0209	0.0307	0.0281	0.0262	0.0248	0.0220	0.0216	0.0223	0.0238	0.0247	0.0262	0.0286	0.0266	0.0224	0.0193	0.0187	0.0183
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0007***	***0.0015***	***0.0028***	***0.0049***	***0.0044***	***0.0038***	***0.0035***	***0.0019***	***0.0017***	***0.0019***	***0.0021***	***0.0023***	***0.0026***	***0.0029***	***0.0026***	***0.0019***	***0.0014***	***0.0013***	***0.0011***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.15E-04	4.22E-04	2.93E-04	2.23E-04	1.96E-04	4.39E-04	9.98E-04	1.84E-03	3.28E-03	2.94E-03	2.56E-03	2.34E-03	1.25E-03	1.16E-03	1.26E-03	1.39E-03	1.51E-03	1.70E-03	1.94E-03	1.73E-03	1.24E-03	9.20E-04	8.36E-04	7.16E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.08E-04	2.11E-04	1.46E-04	1.12E-04	9.80E-05	2.20E-04	4.99E-04	9.20E-04	1.64E-03	1.47E-03	1.28E-03	1.17E-03	6.23E-04	5.80E-04	6.28E-04	6.97E-04	7.53E-04	8.52E-04	9.69E-04	8.65E-04	6.18E-04	4.60E-04	4.18E-04	3.58E-04
	Emission in each Box of 1st jet	g/s	6.15E-05	4.22E-05	2.93E-05	2.23E-05	1.96E-05	4.39E-05	9.98E-05	1.84E-04	3.28E-04	2.94E-04	2.56E-04	2.34E-04	1.25E-04	1.16E-04	1.26E-04	1.39E-04	1.51E-04	1.70E-04	1.94E-04	1.73E-04	1.24E-04	9.20E-05	8.36E-05	7.16E-05
	Emission in each Box of 2nd jet	g/s	3.08E-05	2.11E-05	1.46E-05	1.12E-05	9.80E-06	2.20E-05	4.99E-05	9.20E-05	1.64E-04	1.47E-04	1.28E-04	1.17E-04	6.23E-05	5.80E-05	6.28E-05	6.97E-05	7.53E-05	8.52E-05	9.69E-05	8.65E-05	6.18E-05	4.60E-05	4.18E-05	3.58E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.09E-04	8.52E-05	5.88E-05	4.38E-05	3.78E-05	5.62E-05	1.23E-04	2.82E-04	6.21E-04	5.51E-04	4.70E-04	4.26E-04	2.54E-04	2.34E-04	2.56E-04	2.86E-04	3.11E-04	3.55E-04	4.09E-04	3.66E-04	2.53E-04	1.80E-04	1.62E-04	1.39E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.44E-05	4.26E-05	2.94E-05	2.19E-05	1.89E-05	2.81E-05	6.17E-05	1.41E-04	3.10E-04	2.76E-04	2.35E-04	2.13E-04	1.27E-04	1.17E-04	1.28E-04	1.43E-04	1.55E-04	1.77E-04	2.04E-04	1.83E-04	1.26E-04	8.99E-05	8.11E-05	6.97E-05
	Emission in each Box of 1st jet	g/s	1.09E-05	8.52E-06	5.88E-06	4.38E-06	3.78E-06	5.62E-06	1.23E-05	2.82E-05	6.21E-05	5.51E-05	4.70E-05	4.26E-05	2.54E-05	2.34E-05	2.56E-05	2.86E-05	3.11E-05	3.55E-05	4.09E-05	3.66E-05	2.53E-05	1.80E-05	1.62E-05	1.39E-05
	Emission in each Box of 2nd jet	g/s	5.44E-06	4.26E-06	2.94E-06	2.19E-06	1.89E-06	2.81E-06	6.17E-06	1.41E-05	3.10E-05	2.76E-05	2.35E-05	2.13E-05	1.27E-05	1.17E-05	1.28E-05	1.43E-05	1.55E-05	1.77E-05	2.04E-05	1.83E-05	1.26E-05	8.99E-06	8.11E-06	6.97E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1145	0.0966	0.0979	0.1014	0.1030	0.1925	0.2052	0.1567	0.1845	0.1700	0.1556	0.1525	0.1212	0.1181	0.1214	0.1276	0.1336	0.1401	0.1519	0.1437	0.1210	0.1099	0.1074	0.1044
	NO2	g/vehicle/km	0.0201	0.0193	0.0194	0.0196	0.0196	0.0245	0.0252	0.0238	0.0346	0.0317	0.0285	0.0276	0.0245	0.0236	0.0245	0.0261	0.0274	0.0290	0.0318	0.0301	0.0245	0.0213	0.0207	0.0202
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0017***	***0.0032***	***0.0056***	***0.0050***	***0.0042***	***0.0039***	***0.0021***	***0.0019***	***0.0021***	***0.0023***	***0.0025***	***0.0028***	***0.0033***	***0.0030***	***0.0021***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.96E-04	4.81E-04	3.33E-04	2.56E-04	2.17E-04	4.86E-04	1.11E-03	2.12E-03	3.73E-03	3.34E-03	2.79E-03	2.62E-03	1.40E-03	1.28E-03	1.39E-03	1.54E-03	1.68E-03	1.90E-03	2.18E-03	1.97E-03	1.37E-03	1.02E-03	9.32E-04	7.94E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.48E-04	2.41E-04	1.66E-04	1.28E-04	1.08E-04	2.43E-04	5.54E-04	1.06E-03	1.86E-03	1.67E-03	1.39E-03	1.31E-03	7.00E-04	6.38E-04	6.96E-04	7.68E-04	8.41E-04	9.49E-04	1.09E-03	9.85E-04	6.84E-04	5.12E-04	4.66E-04	3.97E-04
	Emission in each Box of 1st jet	g/s	6.96E-05	4.81E-05	3.33E-05	2.56E-05	2.17E-05	4.86E-05	1.11E-04	2.12E-04	3.73E-04	3.34E-04	2.79E-04	2.62E-04	1.40E-04	1.28E-04	1.39E-04	1.54E-04	1.68E-04	1.90E-04	2.18E-04	1.97E-04	1.37E-04	1.02E-04	9.32E-05	7.94E-05
	Emission in each Box of 2nd jet	g/s	3.48E-05	2.41E-05	1.66E-05	1.28E-05	1.08E-05	2.43E-05	5.54E-05	1.06E-04	1.86E-04	1.67E-04	1.39E-04	1.31E-04	7.00E-05	6.38E-05	6.96E-05	7.68E-05	8.41E-05	9.49E-05	1.09E-04	9.85E-05	6.84E-05	5.12E-05	4.66E-05	3.97E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0010***	***0.0009***	***0.0008***	***0.0007***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.22E-04	9.61E-05	6.60E-05	4.95E-05	4.13E-05	6.18E-05	1.36E-04	3.22E-04	6.99E-04	6.21E-04	5.11E-04	4.74E-04	2.83E-04	2.55E-04	2.81E-04	3.14E-04	3.45E-04	3.93E-04	4.56E-04	4.13E-04	2.77E-04	1.99E-04	1.79E-04	1.53E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.11E-05	4.81E-05	3.30E-05	2.48E-05	2.06E-05	3.09E-05	6.81E-05	1.61E-04	3.50E-04	3.11E-04	2.56E-04	2.37E-04	1.41E-04	1.28E-04	1.41E-04	1.57E-04	1.73E-04	1.97E-04	2.28E-04	2.06E-04	1.39E-04	9.93E-05	8.97E-05	7.67E-05
	Emission in each Box of 1st jet	g/s	1.22E-05	9.61E-06	6.60E-06	4.95E-06	4.13E-06	6.18E-06	1.36E-05	3.22E-05	6.99E-05	6.21E-05	5.11E-05	4.74E-05	2.83E-05	2.55E-05	2.81E-05	3.14E-05	3.45E-05	3.93E-05	4.56E-05	4.13E-05	2.77E-05	1.99E-05	1.79E-05	1.53E-05
	Emission in each Box of 2nd jet	g/s	6.11E-06	4.81E-06	3.30E-06	2.48E-06	2.06E-06	3.09E-06	6.81E-06	1.61E-05	3.50E-05	3.11E-05	2.56E-05	2.37E-05	1.41E-05	1.28E-05	1.41E-05	1.57E-05	1.73E-05	1.97E-05	2.28E-05	2.06E-05	1.39E-05	9.93E-06	8.97E-06	7.67E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1259	0.1077	0.1095	0.1145	0.1167	0.2175	0.2313	0.1764	0.2083	0.1925	0.1761	0.1716	0.1346	0.1313	0.1348	0.1418	0.1476	0.1576	0.1675	0.1609	0.1348	0.1224	0.1198	0.1171
	NO2	g/vehicle/km	0.0219	0.0212	0.0214	0.0218	0.0219	0.0274	0.0282	0.0266	0.0387	0.0355	0.0320	0.0308	0.0270	0.0260	0.0271	0.0288	0.0301	0.0324	0.0348	0.0334	0.0271	0.0235	0.0228	0.0224
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0008***	***0.0019***	***0.0036***	***0.0063***	***0.0057***	***0.0047***	***0.0044***	***0.0023***	***0.0021***	***0.0023***	***0.0026***	***0.0028***	***0.0032***	***0.0036***	***0.0033***	***0.0023***	***0.0017***	***0.0016***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.65E-04	5.37E-04	3.72E-04	2.89E-04	2.46E-04	5.49E-04	1.25E-03	2.38E-03	4.21E-03	3.78E-03	3.16E-03	2.95E-03	1.55E-03	1.42E-03	1.55E-03	1.71E-03	1.86E-03	2.14E-03	2.40E-03	2.21E-03	1.52E-03	1.14E-03	1.04E-03	8.91E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.83E-04	2.68E-04	1.86E-04	1.45E-04	1.23E-04	2.75E-04	6.25E-04	1.19E-03	2.10E-03	1.89E-03	1.58E-03	1.47E-03	7.77E-04	7.09E-04	7.73E-04	8.53E-04	9.29E-04	1.07E-03	1.20E-03	1.10E-03	7.62E-04	5.71E-04	5.20E-04	4.45E-04
	Emission in each Box of 1st jet	g/s	7.65E-05	5.37E-05	3.72E-05	2.89E-05	2.46E-05	5.49E-05	1.25E-04	2.38E-04	4.21E-04	3.78E-04	3.16E-04	2.95E-04	1.55E-04	1.42E-04	1.55E-04	1.71E-04	1.86E-04	2.14E-04	2.40E-04	2.21E-04	1.52E-04	1.14E-04	1.04E-04	8.91E-05
	Emission in each Box of 2nd jet	g/s	3.83E-05	2.68E-05	1.86E-05	1.45E-05	1.23E-05	2.75E-05	6.25E-05	1.19E-04	2.10E-04	1.89E-04	1.58E-04	1.47E-04	7.77E-05	7.09E-05	7.73E-05	8.53E-05	9.29E-05	1.07E-04	1.20E-04	1.10E-04	7.62E-05	5.71E-05	5.20E-05	4.45E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0012***	***0.0010***	***0.0009***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0007***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.33E-04	1.06E-04	7.26E-05	5.50E-05	4.61E-05	6.91E-05	1.52E-04	3.59E-04	7.82E-04	6.98E-04	5.74E-04	5.29E-04	3.12E-04	2.81E-04	3.10E-04	3.46E-04	3.79E-04	4.38E-04	4.99E-04	4.58E-04	3.06E-04	2.19E-04	1.98E-04	1.70E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.64E-05	5.28E-05	3.63E-05	2.75E-05	2.31E-05	3.46E-05	7.61E-05	1.79E-04	3.91E-04	3.49E-04	2.87E-04	2.64E-04	1.56E-04	1.41E-04	1.55E-04	1.73E-04	1.90E-04	2.19E-04	2.49E-04	2.29E-04	1.53E-04	1.10E-04	9.92E-05	8.52E-05
	Emission in each Box of 1st jet	g/s	1.33E-05	1.06E-05	7.26E-06	5.50E-06	4.61E-06	6.91E-06	1.52E-05	3.59E-05	7.82E-05	6.98E-05	5.74E-05	5.29E-05	3.12E-05	2.81E-05	3.10E-05	3.46E-05	3.79E-05	4.38E-05	4.99E-05	4.58E-05	3.06E-05	2.19E-05	1.98E-05	1.70E-05
	Emission in each Box of 2nd jet	g/s	6.64E-06	5.28E-06	3.63E-06	2.75E-06	2.31E-06	3.46E-06	7.61E-06	1.79E-05	3.91E-05	3.49E-05	2.87E-05	2.64E-05	1.56E-05	1.41E-05	1.55E-05	1.73E-05	1.90E-05	2.19E-05	2.49E-05	2.29E-05	1.53E-05	1.10E-05	9.92E-06	8.52E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1065	1020	686	642	681	715	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1332	0.1131	0.1149	0.1195	0.1234	0.2281	0.2418	0.1844	0.2175	0.2008	0.1831	0.1787	0.1399	0.1364	0.1406	0.1476	0.1535	0.1635	0.1756	0.1664	0.1401	0.1270	0.1260	0.1232
	NO2	g/vehicle/km	0.0230	0.0221	0.0223	0.0226	0.0230	0.0286	0.0293	0.0276	0.0402	0.0369	0.0331	0.0319	0.0280	0.0270	0.0281	0.0298	0.0312	0.0334	0.0363	0.0344	0.0280	0.0242	0.0238	0.0233
	RSP	g/vehicle/km	0.0091	0.0076	0.0078	0.0081	0.0083	0.0157	0.0167	0.0122	0.0123	0.0116	0.0111	0.0109	0.0087	0.0087	0.0087	0.0090	0.0092	0.0096	0.0100	0.0096	0.0087	0.0085	0.0085	0.0083
	FSP	g/vehicle/km	0.0084	0.0070	0.0072	0.0075	0.0076	0.0145	0.0153	0.0112	0.0113	0.0107	0.0102	0.0100	0.0080	0.0079	0.0080	0.0082	0.0085	0.0088	0.0092	0.0088	0.0080	0.0078	0.0077	0.0076
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0037***	***0.0066***	***0.0059***	***0.0049***	***0.0046***	***0.0024***	***0.0022***	***0.0024***	***0.0027***	***0.0029***	***0.0033***	***0.0038***	***0.0034***	***0.0024***	***0.0018***	***0.0016***	***0.0014***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.09E-04	5.63E-04	3.91E-04	3.02E-04	2.60E-04	5.76E-04	1.31E-03	2.49E-03	4.39E-03	3.94E-03	3.28E-03	3.07E-03	1.61E-03	1.47E-03	1.61E-03	1.78E-03	1.93E-03	2.22E-03	2.51E-03	2.28E-03	1.58E-03	1.18E-03	1.09E-03	9.37E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.05E-04	2.82E-04	1.95E-04	1.51E-04	1.30E-04	2.88E-04	6.53E-04	1.25E-03	2.20E-03	1.97E-03	1.64E-03	1.53E-03	8.07E-04	7.37E-04	8.06E-04	8.88E-04	9.66E-04	1.11E-03	1.26E-03	1.14E-03	7.92E-04	5.92E-04	5.47E-04	4.69E-04
	Emission in each Box of 1st jet	g/s	8.09E-05	5.63E-05	3.91E-05	3.02E-05	2.60E-05	5.76E-05	1.31E-04	2.49E-04	4.39E-04	3.94E-04	3.28E-04	3.07E-04	1.61E-04	1.47E-04	1.61E-04	1.78E-04	1.93E-04	2.22E-04	2.51E-04	2.28E-04	1.58E-04	1.18E-04	1.09E-04	9.37E-05
	Emission in each Box of 2nd jet	g/s	4.05E-05	2.82E-05	1.95E-05	1.51E-05	1.30E-05	2.88E-05	6.53E-05	1.25E-04	2.20E-04	1.97E-04	1.64E-04	1.53E-04	8.07E-05	7.37E-05	8.06E-05	8.88E-05	9.66E-05	1.11E-04	1.26E-04	1.14E-04	7.92E-05	5.92E-05	5.47E-05	4.69E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.39E-04	1.10E-04	7.57E-05	5.70E-05	4.83E-05	7.21E-05	1.58E-04	3.73E-04	8.12E-04	7.24E-04	5.94E-04	5.48E-04	3.23E-04	2.92E-04	3.23E-04	3.59E-04	3.92E-04	4.52E-04	5.20E-04	4.72E-04	3.17E-04	2.26E-04	2.07E-04	1.77E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.97E-05	5.50E-05	3.79E-05	2.85E-05	2.42E-05	3.61E-05	7.91E-05	1.87E-04	4.06E-04	3.62E-04	2.97E-04	2.74E-04	1.62E-04	1.46E-04	1.61E-04	1.79E-04	1.96E-04	2.26E-04	2.60E-04	2.36E-04	1.58E-04	1.13E-04	1.03E-04	8.87E-05
	Emission in each Box of 1st jet	g/s	1.39E-05	1.10E-05	7.57E-06	5.70E-06	4.83E-06	7.21E-06	1.58E-05	3.73E-05	8.12E-05	7.24E-05	5.94E-05	5.48E-05	3.23E-05	2.92E-05	3.23E-05	3.59E-05	3.92E-05	4.52E-05	5.20E-05	4.72E-05	3.17E-05	2.26E-05	2.07E-05	1.77E-05
	Emission in each Box of 2nd jet	g/s	6.97E-06	5.50E-06	3.79E-06	2.85E-06	2.42E-06	3.61E-06	7.91E-06	1.87E-05	4.06E-05	3.62E-05	2.97E-05	2.74E-05	1.62E-05	1.46E-05	1.61E-05	1.79E-05	1.96E-05	2.26E-05	2.60E-05	2.36E-05	1.58E-05	1.13E-05	1.03E-05	8.87E-06
RSP Emission Rate		g/s	***8.28E-05***	***5.69E-05***	***3.97E-05***	***3.06E-05***	***2.62E-05***	***5.95E-05***	***1.35E-04***	***2.47E-04***	***3.72E-04***	***3.42E-04***	***2.98E-04***	***2.81E-04***	***1.50E-04***	***1.41E-04***	***1.50E-04***	***1.62E-04***	***1.74E-04***	***1.94E-04***	***2.15E-04***	***1.98E-04***	***1.47E-04***	***1.19E-04***	***1.10E-04***	***9.42E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.52E-05	3.79E-05	2.65E-05	2.04E-05	1.74E-05	3.96E-05	9.00E-05	1.65E-04	2.48E-04	2.28E-04	1.98E-04	1.87E-04	1.00E-04	9.38E-05	9.99E-05	1.08E-04	1.16E-04	1.30E-04	1.43E-04	1.32E-04	9.82E-05	7.92E-05	7.35E-05	6.28E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.76E-05	1.90E-05	1.32E-05	1.02E-05	8.72E-06	1.98E-05	4.50E-05	8.23E-05	1.24E-04	1.14E-04	9.92E-05	9.37E-05	5.02E-05	4.69E-05	4.99E-05	5.41E-05	5.80E-05	6.48E-05	7.17E-05	6.59E-05	4.91E-05	3.96E-05	3.68E-05	3.14E-05
	Emission in each Box of 1st jet	g/s	5.52E-06	3.79E-06	2.65E-06	2.04E-06	1.74E-06	3.96E-06	9.00E-06	1.65E-05	2.48E-05	2.28E-05	1.98E-05	1.87E-05	1.00E-05	9.38E-06	9.99E-06	1.08E-05	1.16E-05	1.30E-05	1.43E-05	1.32E-05	9.82E-06	7.92E-06	7.35E-06	6.28E-06
	Emission in each Box of 2nd jet	g/s	2.76E-06	1.90E-06	1.32E-06	1.02E-06	8.72E-07	1.98E-06	4.50E-06	8.23E-06	1.24E-05	1.14E-05	9.92E-06	9.37E-06	5.02E-06	4.69E-06	4.99E-06	5.41E-06	5.80E-06	6.48E-06	7.17E-06	6.59E-06	4.91E-06	3.96E-06	3.68E-06	3.14E-06
FSP Emission Rate		g/s	***7.62E-05***	***5.24E-05***	***3.66E-05***	***2.82E-05***	***2.39E-05***	***5.47E-05***	***1.24E-04***	***2.27E-04***	***3.43E-04***	***3.15E-04***	***2.73E-04***	***2.58E-04***	***1.39E-04***	***1.29E-04***	***1.38E-04***	***1.49E-04***	***1.60E-04***	***1.79E-04***	***1.98E-04***	***1.81E-04***	***1.36E-04***	***1.09E-04***	***1.01E-04***	***8.68E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	5.08E-05	3.49E-05	2.44E-05	1.88E-05	1.59E-05	3.65E-05	8.28E-05	1.51E-04	2.29E-04	2.10E-04	1.82E-04	1.72E-04	9.26E-05	8.59E-05	9.21E-05	9.92E-05	1.06E-04	1.20E-04	1.32E-04	1.21E-04	9.06E-05	7.30E-05	6.72E-05	5.79E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.54E-05	1.75E-05	1.22E-05	9.41E-06	7.97E-06	1.82E-05	4.14E-05	7.57E-05	1.14E-04	1.05E-04	9.11E-05	8.59E-05	4.63E-05	4.29E-05	4.61E-05	4.96E-05	5.32E-05	5.98E-05	6.59E-05	6.05E-05	4.53E-05	3.65E-05	3.36E-05	2.89E-05
	Emission in each Box of 1st jet	g/s	5.08E-06	3.49E-06	2.44E-06	1.88E-06	1.59E-06	3.65E-06	8.28E-06	1.51E-05	2.29E-05	2.10E-05	1.82E-05	1.72E-05	9.26E-06	8.59E-06	9.21E-06	9.92E-06	1.06E-05	1.20E-05	1.32E-05	1.21E-05	9.06E-06	7.30E-06	6.72E-06	5.79E-06
	Emission in each Box of 2nd jet	g/s	2.54E-06	1.75E-06	1.22E-06	9.41E-07	7.97E-07	1.82E-06	4.14E-06	7.57E-06	1.14E-05	1.05E-05	9.11E-06	8.59E-06	4.63E-06	4.29E-06	4.61E-06	4.96E-06	5.32E-06	5.98E-06	6.59E-06	6.05E-06	4.53E-06	3.65E-06	3.36E-06	2.89E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1832	0.1389	0.1437	0.1546	0.1656	0.3822	0.4105	0.2762	0.2065	0.2039	0.2066	0.2097	0.1538	0.1551	0.1514	0.1532	0.1530	0.1521	0.1507	0.1472	0.1513	0.1587	0.1603	0.1548
	NO2	g/vehicle/km	0.0276	0.0258	0.0266	0.0275	0.0281	0.0393	0.0405	0.0328	0.0292	0.0290	0.0292	0.0293	0.0266	0.0265	0.0263	0.0264	0.0263	0.0262	0.0260	0.0259	0.0261	0.0266	0.0267	0.0262
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0065***	***0.0040***	***0.0029***	***0.0023***	***0.0021***	***0.0061***	***0.0140***	***0.0223***	***0.0245***	***0.0234***	***0.0218***	***0.0212***	***0.0144***	***0.0136***	***0.0141***	***0.0150***	***0.0157***	***0.0168***	***0.0176***	***0.0165***	***0.0139***	***0.0119***	***0.0113***	***0.0096***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.33E-03	2.65E-03	1.90E-03	1.53E-03	1.37E-03	4.07E-03	9.34E-03	1.49E-02	1.63E-02	1.56E-02	1.45E-02	1.41E-02	9.63E-03	9.08E-03	9.41E-03	1.00E-02	1.05E-02	1.12E-02	1.17E-02	1.10E-02	9.27E-03	7.96E-03	7.52E-03	6.41E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.17E-03	1.33E-03	9.52E-04	7.63E-04	6.85E-04	2.03E-03	4.67E-03	7.44E-03	8.15E-03	7.80E-03	7.25E-03	7.06E-03	4.81E-03	4.54E-03	4.71E-03	5.00E-03	5.23E-03	5.60E-03	5.87E-03	5.50E-03	4.64E-03	3.98E-03	3.76E-03	3.21E-03
	Emission in each Box of 1st jet	g/s	2.17E-03	1.33E-03	9.52E-04	7.63E-04	6.85E-04	2.03E-03	4.67E-03	7.44E-03	8.15E-03	7.80E-03	7.25E-03	7.06E-03	4.81E-03	4.54E-03	4.71E-03	5.00E-03	5.23E-03	5.60E-03	5.87E-03	5.50E-03	4.64E-03	3.98E-03	3.76E-03	3.21E-03
	Emission in each Box of 2nd jet	g/s	2.17E-03	1.33E-03	9.52E-04	7.63E-04	6.85E-04	2.03E-03	4.67E-03	7.44E-03	8.15E-03	7.80E-03	7.25E-03	7.06E-03	4.81E-03	4.54E-03	4.71E-03	5.00E-03	5.23E-03	5.60E-03	5.87E-03	5.50E-03	4.64E-03	3.98E-03	3.76E-03	3.21E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0014***	***0.0027***	***0.0035***	***0.0033***	***0.0031***	***0.0030***	***0.0025***	***0.0023***	***0.0024***	***0.0026***	***0.0027***	***0.0029***	***0.0030***	***0.0029***	***0.0024***	***0.0020***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.52E-04	4.93E-04	3.53E-04	2.72E-04	2.33E-04	4.18E-04	9.22E-04	1.77E-03	2.31E-03	2.22E-03	2.05E-03	1.97E-03	1.66E-03	1.55E-03	1.63E-03	1.72E-03	1.80E-03	1.93E-03	2.03E-03	1.93E-03	1.60E-03	1.33E-03	1.25E-03	1.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.26E-04	2.46E-04	1.76E-04	1.36E-04	1.16E-04	2.09E-04	4.61E-04	8.84E-04	1.15E-03	1.11E-03	1.03E-03	9.87E-04	8.31E-04	7.77E-04	8.16E-04	8.61E-04	9.00E-04	9.64E-04	1.01E-03	9.67E-04	8.01E-04	6.66E-04	6.25E-04	5.43E-04
	Emission in each Box of 1st jet	g/s	3.26E-04	2.46E-04	1.76E-04	1.36E-04	1.16E-04	2.09E-04	4.61E-04	8.84E-04	1.15E-03	1.11E-03	1.03E-03	9.87E-04	8.31E-04	7.77E-04	8.16E-04	8.61E-04	9.00E-04	9.64E-04	1.01E-03	9.67E-04	8.01E-04	6.66E-04	6.25E-04	5.43E-04
	Emission in each Box of 2nd jet	g/s	3.26E-04	2.46E-04	1.76E-04	1.36E-04	1.16E-04	2.09E-04	4.61E-04	8.84E-04	1.15E-03	1.11E-03	1.03E-03	9.87E-04	8.31E-04	7.77E-04	8.16E-04	8.61E-04	9.00E-04	9.64E-04	1.01E-03	9.67E-04	8.01E-04	6.66E-04	6.25E-04	5.43E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1712	0.1283	0.1323	0.1441	0.1542	0.3577	0.3807	0.2586	0.1911	0.1864	0.1902	0.1932	0.1414	0.1436	0.1414	0.1418	0.1414	0.1413	0.1398	0.1375	0.1414	0.1486	0.1484	0.1432
	NO2	g/vehicle/km	0.0260	0.0242	0.0249	0.0260	0.0265	0.0369	0.0378	0.0309	0.0273	0.0268	0.0271	0.0272	0.0246	0.0248	0.0247	0.0246	0.0246	0.0245	0.0244	0.0244	0.0246	0.0251	0.0249	0.0245
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0061***	***0.0037***	***0.0026***	***0.0021***	***0.0019***	***0.0057***	***0.0130***	***0.0209***	***0.0226***	***0.0214***	***0.0200***	***0.0195***	***0.0133***	***0.0126***	***0.0132***	***0.0139***	***0.0145***	***0.0156***	***0.0163***	***0.0154***	***0.0130***	***0.0112***	***0.0104***	***0.0089***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.05E-03	2.45E-03	1.75E-03	1.42E-03	1.28E-03	3.81E-03	8.66E-03	1.39E-02	1.51E-02	1.43E-02	1.34E-02	1.30E-02	8.85E-03	8.41E-03	8.79E-03	9.26E-03	9.66E-03	1.04E-02	1.09E-02	1.03E-02	8.67E-03	7.45E-03	6.96E-03	5.93E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.03E-03	1.22E-03	8.77E-04	7.12E-04	6.38E-04	1.90E-03	4.33E-03	6.97E-03	7.55E-03	7.14E-03	6.68E-03	6.50E-03	4.43E-03	4.21E-03	4.40E-03	4.63E-03	4.83E-03	5.20E-03	5.45E-03	5.14E-03	4.33E-03	3.73E-03	3.48E-03	2.97E-03
	Emission in each Box of 1st jet	g/s	2.03E-03	1.22E-03	8.77E-04	7.12E-04	6.38E-04	1.90E-03	4.33E-03	6.97E-03	7.55E-03	7.14E-03	6.68E-03	6.50E-03	4.43E-03	4.21E-03	4.40E-03	4.63E-03	4.83E-03	5.20E-03	5.45E-03	5.14E-03	4.33E-03	3.73E-03	3.48E-03	2.97E-03
	Emission in each Box of 2nd jet	g/s	2.03E-03	1.22E-03	8.77E-04	7.12E-04	6.38E-04	1.90E-03	4.33E-03	6.97E-03	7.55E-03	7.14E-03	6.68E-03	6.50E-03	4.43E-03	4.21E-03	4.40E-03	4.63E-03	4.83E-03	5.20E-03	5.45E-03	5.14E-03	4.33E-03	3.73E-03	3.48E-03	2.97E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0025***	***0.0032***	***0.0031***	***0.0029***	***0.0027***	***0.0023***	***0.0022***	***0.0023***	***0.0024***	***0.0025***	***0.0027***	***0.0029***	***0.0027***	***0.0023***	***0.0019***	***0.0018***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.15E-04	4.61E-04	3.29E-04	2.56E-04	2.19E-04	3.93E-04	8.61E-04	1.66E-03	2.15E-03	2.05E-03	1.90E-03	1.83E-03	1.54E-03	1.45E-03	1.53E-03	1.61E-03	1.68E-03	1.81E-03	1.90E-03	1.83E-03	1.51E-03	1.26E-03	1.17E-03	1.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.07E-04	2.31E-04	1.65E-04	1.28E-04	1.10E-04	1.96E-04	4.30E-04	8.31E-04	1.08E-03	1.02E-03	9.52E-04	9.15E-04	7.71E-04	7.26E-04	7.67E-04	8.04E-04	8.39E-04	9.04E-04	9.50E-04	9.14E-04	7.54E-04	6.29E-04	5.84E-04	5.07E-04
	Emission in each Box of 1st jet	g/s	3.07E-04	2.31E-04	1.65E-04	1.28E-04	1.10E-04	1.96E-04	4.30E-04	8.31E-04	1.08E-03	1.02E-03	9.52E-04	9.15E-04	7.71E-04	7.26E-04	7.67E-04	8.04E-04	8.39E-04	9.04E-04	9.50E-04	9.14E-04	7.54E-04	6.29E-04	5.84E-04	5.07E-04
	Emission in each Box of 2nd jet	g/s	3.07E-04	2.31E-04	1.65E-04	1.28E-04	1.10E-04	1.96E-04	4.30E-04	8.31E-04	1.08E-03	1.02E-03	9.52E-04	9.15E-04	7.71E-04	7.26E-04	7.67E-04	8.04E-04	8.39E-04	9.04E-04	9.50E-04	9.14E-04	7.54E-04	6.29E-04	5.84E-04	5.07E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1615	0.1209	0.1250	0.1341	0.1436	0.3353	0.3579	0.2434	0.1802	0.1773	0.1789	0.1842	0.1347	0.1347	0.1327	0.1347	0.1328	0.1334	0.1329	0.1295	0.1326	0.1395	0.1392	0.1346
	NO2	g/vehicle/km	0.0246	0.0229	0.0237	0.0244	0.0249	0.0348	0.0357	0.0292	0.0258	0.0256	0.0256	0.0260	0.0236	0.0234	0.0233	0.0235	0.0232	0.0233	0.0233	0.0231	0.0233	0.0237	0.0236	0.0232
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0057***	***0.0035***	***0.0025***	***0.0020***	***0.0018***	***0.0054***	***0.0122***	***0.0197***	***0.0213***	***0.0204***	***0.0188***	***0.0186***	***0.0126***	***0.0118***	***0.0124***	***0.0132***	***0.0136***	***0.0147***	***0.0155***	***0.0145***	***0.0122***	***0.0105***	***0.0098***	***0.0084***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.82E-03	2.31E-03	1.66E-03	1.32E-03	1.19E-03	3.57E-03	8.14E-03	1.31E-02	1.42E-02	1.36E-02	1.26E-02	1.24E-02	8.43E-03	7.89E-03	8.25E-03	8.79E-03	9.07E-03	9.83E-03	1.04E-02	9.69E-03	8.13E-03	6.99E-03	6.53E-03	5.57E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.91E-03	1.15E-03	8.29E-04	6.62E-04	5.94E-04	1.78E-03	4.07E-03	6.56E-03	7.11E-03	6.79E-03	6.28E-03	6.20E-03	4.22E-03	3.94E-03	4.12E-03	4.40E-03	4.54E-03	4.91E-03	5.18E-03	4.84E-03	4.06E-03	3.50E-03	3.27E-03	2.79E-03
	Emission in each Box of 1st jet	g/s	1.91E-03	1.15E-03	8.29E-04	6.62E-04	5.94E-04	1.78E-03	4.07E-03	6.56E-03	7.11E-03	6.79E-03	6.28E-03	6.20E-03	4.22E-03	3.94E-03	4.12E-03	4.40E-03	4.54E-03	4.91E-03	5.18E-03	4.84E-03	4.06E-03	3.50E-03	3.27E-03	2.79E-03
	Emission in each Box of 2nd jet	g/s	1.91E-03	1.15E-03	8.29E-04	6.62E-04	5.94E-04	1.78E-03	4.07E-03	6.56E-03	7.11E-03	6.79E-03	6.28E-03	6.20E-03	4.22E-03	3.94E-03	4.12E-03	4.40E-03	4.54E-03	4.91E-03	5.18E-03	4.84E-03	4.06E-03	3.50E-03	3.27E-03	2.79E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0012***	***0.0024***	***0.0031***	***0.0029***	***0.0027***	***0.0026***	***0.0022***	***0.0021***	***0.0022***	***0.0023***	***0.0024***	***0.0026***	***0.0027***	***0.0026***	***0.0021***	***0.0018***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.83E-04	4.38E-04	3.14E-04	2.41E-04	2.06E-04	3.70E-04	8.13E-04	1.57E-03	2.04E-03	1.96E-03	1.80E-03	1.75E-03	1.47E-03	1.37E-03	1.45E-03	1.53E-03	1.59E-03	1.72E-03	1.82E-03	1.73E-03	1.43E-03	1.19E-03	1.11E-03	9.62E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.91E-04	2.19E-04	1.57E-04	1.21E-04	1.03E-04	1.85E-04	4.06E-04	7.87E-04	1.02E-03	9.78E-04	9.00E-04	8.75E-04	7.37E-04	6.85E-04	7.24E-04	7.67E-04	7.93E-04	8.58E-04	9.09E-04	8.65E-04	7.13E-04	5.95E-04	5.53E-04	4.81E-04
	Emission in each Box of 1st jet	g/s	2.91E-04	2.19E-04	1.57E-04	1.21E-04	1.03E-04	1.85E-04	4.06E-04	7.87E-04	1.02E-03	9.78E-04	9.00E-04	8.75E-04	7.37E-04	6.85E-04	7.24E-04	7.67E-04	7.93E-04	8.58E-04	9.09E-04	8.65E-04	7.13E-04	5.95E-04	5.53E-04	4.81E-04
	Emission in each Box of 2nd jet	g/s	2.91E-04	2.19E-04	1.57E-04	1.21E-04	1.03E-04	1.85E-04	4.06E-04	7.87E-04	1.02E-03	9.78E-04	9.00E-04	8.75E-04	7.37E-04	6.85E-04	7.24E-04	7.67E-04	7.93E-04	8.58E-04	9.09E-04	8.65E-04	7.13E-04	5.95E-04	5.53E-04	4.81E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1517	0.1132	0.1166	0.1281	0.1373	0.3226	0.3444	0.2318	0.1714	0.1689	0.1702	0.1749	0.1279	0.1301	0.1281	0.1277	0.1286	0.1267	0.1263	0.1224	0.1256	0.1343	0.1335	0.1286
	NO2	g/vehicle/km	0.0233	0.0217	0.0223	0.0235	0.0240	0.0336	0.0344	0.0279	0.0247	0.0244	0.0245	0.0248	0.0225	0.0227	0.0226	0.0224	0.0225	0.0222	0.0223	0.0220	0.0222	0.0229	0.0227	0.0223
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0054***	***0.0032***	***0.0023***	***0.0019***	***0.0017***	***0.0052***	***0.0118***	***0.0187***	***0.0203***	***0.0194***	***0.0179***	***0.0177***	***0.0120***	***0.0114***	***0.0119***	***0.0125***	***0.0132***	***0.0140***	***0.0148***	***0.0137***	***0.0116***	***0.0101***	***0.0094***	***0.0080***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.59E-03	2.16E-03	1.54E-03	1.27E-03	1.14E-03	3.43E-03	7.84E-03	1.25E-02	1.35E-02	1.29E-02	1.19E-02	1.18E-02	8.00E-03	7.62E-03	7.97E-03	8.34E-03	8.79E-03	9.34E-03	9.84E-03	9.15E-03	7.70E-03	6.74E-03	6.27E-03	5.33E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.79E-03	1.08E-03	7.72E-04	6.33E-04	5.68E-04	1.72E-03	3.92E-03	6.24E-03	6.77E-03	6.46E-03	5.97E-03	5.88E-03	4.00E-03	3.81E-03	3.98E-03	4.17E-03	4.39E-03	4.67E-03	4.92E-03	4.58E-03	3.85E-03	3.37E-03	3.13E-03	2.66E-03
	Emission in each Box of 1st jet	g/s	1.79E-03	1.08E-03	7.72E-04	6.33E-04	5.68E-04	1.72E-03	3.92E-03	6.24E-03	6.77E-03	6.46E-03	5.97E-03	5.88E-03	4.00E-03	3.81E-03	3.98E-03	4.17E-03	4.39E-03	4.67E-03	4.92E-03	4.58E-03	3.85E-03	3.37E-03	3.13E-03	2.66E-03
	Emission in each Box of 2nd jet	g/s	1.79E-03	1.08E-03	7.72E-04	6.33E-04	5.68E-04	1.72E-03	3.92E-03	6.24E-03	6.77E-03	6.46E-03	5.97E-03	5.88E-03	4.00E-03	3.81E-03	3.98E-03	4.17E-03	4.39E-03	4.67E-03	4.92E-03	4.58E-03	3.85E-03	3.37E-03	3.13E-03	2.66E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0012***	***0.0023***	***0.0029***	***0.0028***	***0.0026***	***0.0025***	***0.0021***	***0.0020***	***0.0021***	***0.0022***	***0.0023***	***0.0025***	***0.0026***	***0.0025***	***0.0020***	***0.0017***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.51E-04	4.14E-04	2.95E-04	2.32E-04	1.98E-04	3.57E-04	7.84E-04	1.50E-03	1.95E-03	1.87E-03	1.72E-03	1.67E-03	1.41E-03	1.33E-03	1.40E-03	1.46E-03	1.54E-03	1.64E-03	1.74E-03	1.65E-03	1.36E-03	1.15E-03	1.07E-03	9.23E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.75E-04	2.07E-04	1.48E-04	1.16E-04	9.92E-05	1.79E-04	3.92E-04	7.52E-04	9.74E-04	9.35E-04	8.59E-04	8.35E-04	7.03E-04	6.64E-04	7.02E-04	7.31E-04	7.70E-04	8.19E-04	8.68E-04	8.23E-04	6.80E-04	5.75E-04	5.33E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	2.75E-04	2.07E-04	1.48E-04	1.16E-04	9.92E-05	1.79E-04	3.92E-04	7.52E-04	9.74E-04	9.35E-04	8.59E-04	8.35E-04	7.03E-04	6.64E-04	7.02E-04	7.31E-04	7.70E-04	8.19E-04	8.68E-04	8.23E-04	6.80E-04	5.75E-04	5.33E-04	4.61E-04
	Emission in each Box of 2nd jet	g/s	2.75E-04	2.07E-04	1.48E-04	1.16E-04	9.92E-05	1.79E-04	3.92E-04	7.52E-04	9.74E-04	9.35E-04	8.59E-04	8.35E-04	7.03E-04	6.64E-04	7.02E-04	7.31E-04	7.70E-04	8.19E-04	8.68E-04	8.23E-04	6.80E-04	5.75E-04	5.33E-04	4.61E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1364	0.1008	0.1041	0.1113	0.1193	0.2816	0.2971	0.2014	0.1507	0.1477	0.1514	0.1553	0.1143	0.1158	0.1148	0.1138	0.1143	0.1143	0.1110	0.1096	0.1123	0.1167	0.1169	0.1124
	NO2	g/vehicle/km	0.0211	0.0195	0.0201	0.0207	0.0212	0.0295	0.0300	0.0244	0.0218	0.0215	0.0219	0.0222	0.0202	0.0203	0.0203	0.0201	0.0202	0.0202	0.0197	0.0198	0.0200	0.0201	0.0200	0.0197
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0048***	***0.0029***	***0.0021***	***0.0016***	***0.0015***	***0.0045***	***0.0101***	***0.0163***	***0.0179***	***0.0170***	***0.0160***	***0.0157***	***0.0107***	***0.0102***	***0.0107***	***0.0112***	***0.0117***	***0.0126***	***0.0130***	***0.0123***	***0.0103***	***0.0088***	***0.0082***	***0.0070***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.23E-03	1.92E-03	1.38E-03	1.10E-03	9.87E-04	3.00E-03	6.76E-03	1.09E-02	1.19E-02	1.13E-02	1.06E-02	1.05E-02	7.16E-03	6.78E-03	7.14E-03	7.44E-03	7.81E-03	8.42E-03	8.65E-03	8.19E-03	6.88E-03	5.85E-03	5.49E-03	4.65E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.61E-03	9.62E-04	6.90E-04	5.50E-04	4.94E-04	1.50E-03	3.38E-03	5.43E-03	5.95E-03	5.65E-03	5.32E-03	5.23E-03	3.58E-03	3.39E-03	3.57E-03	3.72E-03	3.91E-03	4.21E-03	4.32E-03	4.10E-03	3.44E-03	2.93E-03	2.74E-03	2.33E-03
	Emission in each Box of 1st jet	g/s	1.61E-03	9.62E-04	6.90E-04	5.50E-04	4.94E-04	1.50E-03	3.38E-03	5.43E-03	5.95E-03	5.65E-03	5.32E-03	5.23E-03	3.58E-03	3.39E-03	3.57E-03	3.72E-03	3.91E-03	4.21E-03	4.32E-03	4.10E-03	3.44E-03	2.93E-03	2.74E-03	2.33E-03
	Emission in each Box of 2nd jet	g/s	1.61E-03	9.62E-04	6.90E-04	5.50E-04	4.94E-04	1.50E-03	3.38E-03	5.43E-03	5.95E-03	5.65E-03	5.32E-03	5.23E-03	3.58E-03	3.39E-03	3.57E-03	3.72E-03	3.91E-03	4.21E-03	4.32E-03	4.10E-03	3.44E-03	2.93E-03	2.74E-03	2.33E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0020***	***0.0026***	***0.0025***	***0.0023***	***0.0022***	***0.0019***	***0.0018***	***0.0019***	***0.0020***	***0.0021***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.98E-04	3.73E-04	2.67E-04	2.05E-04	1.75E-04	3.14E-04	6.82E-04	1.32E-03	1.72E-03	1.65E-03	1.54E-03	1.49E-03	1.26E-03	1.19E-03	1.26E-03	1.31E-03	1.38E-03	1.49E-03	1.54E-03	1.48E-03	1.22E-03	1.01E-03	9.40E-04	8.14E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.49E-04	1.86E-04	1.33E-04	1.02E-04	8.75E-05	1.57E-04	3.41E-04	6.58E-04	8.62E-04	8.24E-04	7.69E-04	7.46E-04	6.32E-04	5.93E-04	6.31E-04	6.55E-04	6.89E-04	7.43E-04	7.69E-04	7.42E-04	6.12E-04	5.04E-04	4.70E-04	4.07E-04
	Emission in each Box of 1st jet	g/s	2.49E-04	1.86E-04	1.33E-04	1.02E-04	8.75E-05	1.57E-04	3.41E-04	6.58E-04	8.62E-04	8.24E-04	7.69E-04	7.46E-04	6.32E-04	5.93E-04	6.31E-04	6.55E-04	6.89E-04	7.43E-04	7.69E-04	7.42E-04	6.12E-04	5.04E-04	4.70E-04	4.07E-04
	Emission in each Box of 2nd jet	g/s	2.49E-04	1.86E-04	1.33E-04	1.02E-04	8.75E-05	1.57E-04	3.41E-04	6.58E-04	8.62E-04	8.24E-04	7.69E-04	7.46E-04	6.32E-04	5.93E-04	6.31E-04	6.55E-04	6.89E-04	7.43E-04	7.69E-04	7.42E-04	6.12E-04	5.04E-04	4.70E-04	4.07E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1315	0.0977	0.1035	0.1107	0.1180	0.2786	0.2903	0.1990	0.1474	0.1474	0.1466	0.1504	0.1097	0.1119	0.1094	0.1101	0.1124	0.1114	0.1089	0.1083	0.1110	0.1160	0.1156	0.1118
	NO2	g/vehicle/km	0.0204	0.0190	0.0200	0.0206	0.0209	0.0292	0.0293	0.0242	0.0214	0.0215	0.0213	0.0215	0.0195	0.0197	0.0195	0.0195	0.0199	0.0197	0.0194	0.0196	0.0198	0.0200	0.0198	0.0196
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0047***	***0.0028***	***0.0021***	***0.0016***	***0.0015***	***0.0044***	***0.0099***	***0.0161***	***0.0175***	***0.0169***	***0.0154***	***0.0152***	***0.0103***	***0.0098***	***0.0102***	***0.0108***	***0.0115***	***0.0123***	***0.0127***	***0.0122***	***0.0102***	***0.0087***	***0.0081***	***0.0069***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.11E-03	1.87E-03	1.37E-03	1.09E-03	9.76E-04	2.96E-03	6.61E-03	1.07E-02	1.16E-02	1.13E-02	1.03E-02	1.01E-02	6.87E-03	6.55E-03	6.80E-03	7.19E-03	7.68E-03	8.21E-03	8.48E-03	8.10E-03	6.80E-03	5.82E-03	5.42E-03	4.63E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.56E-03	9.33E-04	6.86E-04	5.47E-04	4.88E-04	1.48E-03	3.30E-03	5.36E-03	5.82E-03	5.64E-03	5.15E-03	5.06E-03	3.44E-03	3.28E-03	3.40E-03	3.60E-03	3.84E-03	4.11E-03	4.24E-03	4.05E-03	3.40E-03	2.91E-03	2.71E-03	2.31E-03
	Emission in each Box of 1st jet	g/s	1.56E-03	9.33E-04	6.86E-04	5.47E-04	4.88E-04	1.48E-03	3.30E-03	5.36E-03	5.82E-03	5.64E-03	5.15E-03	5.06E-03	3.44E-03	3.28E-03	3.40E-03	3.60E-03	3.84E-03	4.11E-03	4.24E-03	4.05E-03	3.40E-03	2.91E-03	2.71E-03	2.31E-03
	Emission in each Box of 2nd jet	g/s	1.56E-03	9.33E-04	6.86E-04	5.47E-04	4.88E-04	1.48E-03	3.30E-03	5.36E-03	5.82E-03	5.64E-03	5.15E-03	5.06E-03	3.44E-03	3.28E-03	3.40E-03	3.60E-03	3.84E-03	4.11E-03	4.24E-03	4.05E-03	3.40E-03	2.91E-03	2.71E-03	2.31E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0020***	***0.0025***	***0.0025***	***0.0022***	***0.0022***	***0.0018***	***0.0017***	***0.0018***	***0.0019***	***0.0020***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.82E-04	3.62E-04	2.65E-04	2.04E-04	1.73E-04	3.11E-04	6.67E-04	1.30E-03	1.69E-03	1.65E-03	1.49E-03	1.45E-03	1.22E-03	1.15E-03	1.21E-03	1.27E-03	1.36E-03	1.45E-03	1.51E-03	1.47E-03	1.21E-03	1.00E-03	9.31E-04	8.10E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.41E-04	1.81E-04	1.33E-04	1.02E-04	8.66E-05	1.56E-04	3.33E-04	6.51E-04	8.45E-04	8.23E-04	7.47E-04	7.24E-04	6.10E-04	5.76E-04	6.05E-04	6.36E-04	6.79E-04	7.27E-04	7.56E-04	7.34E-04	6.05E-04	5.02E-04	4.65E-04	4.05E-04
	Emission in each Box of 1st jet	g/s	2.41E-04	1.81E-04	1.33E-04	1.02E-04	8.66E-05	1.56E-04	3.33E-04	6.51E-04	8.45E-04	8.23E-04	7.47E-04	7.24E-04	6.10E-04	5.76E-04	6.05E-04	6.36E-04	6.79E-04	7.27E-04	7.56E-04	7.34E-04	6.05E-04	5.02E-04	4.65E-04	4.05E-04
	Emission in each Box of 2nd jet	g/s	2.41E-04	1.81E-04	1.33E-04	1.02E-04	8.66E-05	1.56E-04	3.33E-04	6.51E-04	8.45E-04	8.23E-04	7.47E-04	7.24E-04	6.10E-04	5.76E-04	6.05E-04	6.36E-04	6.79E-04	7.27E-04	7.56E-04	7.34E-04	6.05E-04	5.02E-04	4.65E-04	4.05E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1324	0.0971	0.1003	0.1071	0.1149	0.2700	0.2903	0.1940	0.1438	0.1425	0.1472	0.1521	0.1077	0.1099	0.1107	0.1106	0.1103	0.1111	0.1077	0.1070	0.1089	0.1146	0.1141	0.1089
	NO2	g/vehicle/km	0.0205	0.0189	0.0195	0.0201	0.0205	0.0284	0.0293	0.0236	0.0209	0.0208	0.0213	0.0217	0.0191	0.0194	0.0197	0.0195	0.0195	0.0197	0.0192	0.0194	0.0194	0.0198	0.0196	0.0191
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0047***	***0.0028***	***0.0020***	***0.0016***	***0.0014***	***0.0043***	***0.0099***	***0.0157***	***0.0170***	***0.0164***	***0.0155***	***0.0153***	***0.0101***	***0.0097***	***0.0103***	***0.0108***	***0.0113***	***0.0123***	***0.0126***	***0.0120***	***0.0100***	***0.0086***	***0.0080***	***0.0068***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.13E-03	1.85E-03	1.33E-03	1.06E-03	9.50E-04	2.87E-03	6.61E-03	1.05E-02	1.14E-02	1.09E-02	1.03E-02	1.02E-02	6.74E-03	6.44E-03	6.89E-03	7.22E-03	7.54E-03	8.18E-03	8.39E-03	8.01E-03	6.68E-03	5.75E-03	5.35E-03	4.51E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.57E-03	9.27E-04	6.64E-04	5.29E-04	4.75E-04	1.44E-03	3.30E-03	5.23E-03	5.68E-03	5.45E-03	5.17E-03	5.12E-03	3.37E-03	3.22E-03	3.44E-03	3.61E-03	3.77E-03	4.09E-03	4.19E-03	4.00E-03	3.34E-03	2.87E-03	2.68E-03	2.25E-03
	Emission in each Box of 1st jet	g/s	1.57E-03	9.27E-04	6.64E-04	5.29E-04	4.75E-04	1.44E-03	3.30E-03	5.23E-03	5.68E-03	5.45E-03	5.17E-03	5.12E-03	3.37E-03	3.22E-03	3.44E-03	3.61E-03	3.77E-03	4.09E-03	4.19E-03	4.00E-03	3.34E-03	2.87E-03	2.68E-03	2.25E-03
	Emission in each Box of 2nd jet	g/s	1.57E-03	9.27E-04	6.64E-04	5.29E-04	4.75E-04	1.44E-03	3.30E-03	5.23E-03	5.68E-03	5.45E-03	5.17E-03	5.12E-03	3.37E-03	3.22E-03	3.44E-03	3.61E-03	3.77E-03	4.09E-03	4.19E-03	4.00E-03	3.34E-03	2.87E-03	2.68E-03	2.25E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0019***	***0.0025***	***0.0024***	***0.0022***	***0.0022***	***0.0018***	***0.0017***	***0.0018***	***0.0019***	***0.0020***	***0.0022***	***0.0022***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.85E-04	3.60E-04	2.58E-04	1.98E-04	1.69E-04	3.02E-04	6.67E-04	1.27E-03	1.65E-03	1.60E-03	1.50E-03	1.46E-03	1.20E-03	1.13E-03	1.22E-03	1.28E-03	1.33E-03	1.45E-03	1.50E-03	1.45E-03	1.19E-03	9.92E-04	9.20E-04	7.90E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.42E-04	1.80E-04	1.29E-04	9.90E-05	8.46E-05	1.51E-04	3.33E-04	6.35E-04	8.25E-04	7.98E-04	7.49E-04	7.32E-04	5.99E-04	5.66E-04	6.12E-04	6.38E-04	6.67E-04	7.24E-04	7.48E-04	7.27E-04	5.95E-04	4.96E-04	4.60E-04	3.95E-04
	Emission in each Box of 1st jet	g/s	2.42E-04	1.80E-04	1.29E-04	9.90E-05	8.46E-05	1.51E-04	3.33E-04	6.35E-04	8.25E-04	7.98E-04	7.49E-04	7.32E-04	5.99E-04	5.66E-04	6.12E-04	6.38E-04	6.67E-04	7.24E-04	7.48E-04	7.27E-04	5.95E-04	4.96E-04	4.60E-04	3.95E-04
	Emission in each Box of 2nd jet	g/s	2.42E-04	1.80E-04	1.29E-04	9.90E-05	8.46E-05	1.51E-04	3.33E-04	6.35E-04	8.25E-04	7.98E-04	7.49E-04	7.32E-04	5.99E-04	5.66E-04	6.12E-04	6.38E-04	6.67E-04	7.24E-04	7.48E-04	7.27E-04	5.95E-04	4.96E-04	4.60E-04	3.95E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1341	0.0991	0.1023	0.1094	0.1173	0.2756	0.2961	0.1990	0.1455	0.1430	0.1495	0.1524	0.1097	0.1119	0.1102	0.1101	0.1130	0.1107	0.1108	0.1070	0.1089	0.1146	0.1141	0.1104
	NO2	g/vehicle/km	0.0207	0.0192	0.0198	0.0204	0.0208	0.0289	0.0298	0.0242	0.0212	0.0209	0.0217	0.0218	0.0195	0.0197	0.0196	0.0195	0.0200	0.0196	0.0197	0.0194	0.0194	0.0198	0.0196	0.0193
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0048***	***0.0028***	***0.0020***	***0.0016***	***0.0015***	***0.0044***	***0.0101***	***0.0161***	***0.0172***	***0.0164***	***0.0158***	***0.0154***	***0.0103***	***0.0098***	***0.0103***	***0.0108***	***0.0116***	***0.0122***	***0.0130***	***0.0120***	***0.0100***	***0.0086***	***0.0080***	***0.0069***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.17E-03	1.89E-03	1.36E-03	1.08E-03	9.70E-04	2.93E-03	6.74E-03	1.07E-02	1.15E-02	1.09E-02	1.05E-02	1.03E-02	6.87E-03	6.55E-03	6.85E-03	7.19E-03	7.72E-03	8.16E-03	8.63E-03	8.00E-03	6.68E-03	5.75E-03	5.35E-03	4.57E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.59E-03	9.46E-04	6.78E-04	5.40E-04	4.85E-04	1.47E-03	3.37E-03	5.36E-03	5.75E-03	5.47E-03	5.25E-03	5.13E-03	3.44E-03	3.28E-03	3.43E-03	3.60E-03	3.86E-03	4.08E-03	4.32E-03	4.00E-03	3.34E-03	2.87E-03	2.68E-03	2.29E-03
	Emission in each Box of 1st jet	g/s	1.59E-03	9.46E-04	6.78E-04	5.40E-04	4.85E-04	1.47E-03	3.37E-03	5.36E-03	5.75E-03	5.47E-03	5.25E-03	5.13E-03	3.44E-03	3.28E-03	3.43E-03	3.60E-03	3.86E-03	4.08E-03	4.32E-03	4.00E-03	3.34E-03	2.87E-03	2.68E-03	2.29E-03
	Emission in each Box of 2nd jet	g/s	1.59E-03	9.46E-04	6.78E-04	5.40E-04	4.85E-04	1.47E-03	3.37E-03	5.36E-03	5.75E-03	5.47E-03	5.25E-03	5.13E-03	3.44E-03	3.28E-03	3.43E-03	3.60E-03	3.86E-03	4.08E-03	4.32E-03	4.00E-03	3.34E-03	2.87E-03	2.68E-03	2.29E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0020***	***0.0025***	***0.0024***	***0.0023***	***0.0022***	***0.0018***	***0.0017***	***0.0018***	***0.0019***	***0.0020***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.91E-04	3.67E-04	2.63E-04	2.02E-04	1.72E-04	3.08E-04	6.79E-04	1.30E-03	1.67E-03	1.60E-03	1.52E-03	1.47E-03	1.22E-03	1.15E-03	1.22E-03	1.27E-03	1.37E-03	1.45E-03	1.54E-03	1.45E-03	1.19E-03	9.93E-04	9.21E-04	8.01E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.45E-04	1.83E-04	1.31E-04	1.01E-04	8.62E-05	1.54E-04	3.40E-04	6.51E-04	8.35E-04	8.00E-04	7.61E-04	7.33E-04	6.10E-04	5.76E-04	6.09E-04	6.36E-04	6.83E-04	7.23E-04	7.69E-04	7.27E-04	5.96E-04	4.96E-04	4.60E-04	4.01E-04
	Emission in each Box of 1st jet	g/s	2.45E-04	1.83E-04	1.31E-04	1.01E-04	8.62E-05	1.54E-04	3.40E-04	6.51E-04	8.35E-04	8.00E-04	7.61E-04	7.33E-04	6.10E-04	5.76E-04	6.09E-04	6.36E-04	6.83E-04	7.23E-04	7.69E-04	7.27E-04	5.96E-04	4.96E-04	4.60E-04	4.01E-04
	Emission in each Box of 2nd jet	g/s	2.45E-04	1.83E-04	1.31E-04	1.01E-04	8.62E-05	1.54E-04	3.40E-04	6.51E-04	8.35E-04	8.00E-04	7.61E-04	7.33E-04	6.10E-04	5.76E-04	6.09E-04	6.36E-04	6.83E-04	7.23E-04	7.69E-04	7.27E-04	5.96E-04	4.96E-04	4.60E-04	4.01E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1331	0.0983	0.1016	0.1078	0.1193	0.2801	0.2993	0.1964	0.1468	0.1446	0.1514	0.1521	0.1111	0.1149	0.1124	0.1131	0.1119	0.1103	0.1103	0.1057	0.1123	0.1174	0.1169	0.1131
	NO2	g/vehicle/km	0.0206	0.0191	0.0197	0.0202	0.0212	0.0294	0.0302	0.0239	0.0213	0.0211	0.0219	0.0217	0.0197	0.0202	0.0199	0.0199	0.0198	0.0195	0.0196	0.0192	0.0200	0.0202	0.0200	0.0198
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0047***	***0.0028***	***0.0020***	***0.0016***	***0.0015***	***0.0045***	***0.0102***	***0.0159***	***0.0174***	***0.0166***	***0.0160***	***0.0154***	***0.0104***	***0.0101***	***0.0105***	***0.0111***	***0.0115***	***0.0122***	***0.0129***	***0.0119***	***0.0103***	***0.0088***	***0.0082***	***0.0070***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.15E-03	1.88E-03	1.35E-03	1.06E-03	9.87E-04	2.98E-03	6.81E-03	1.06E-02	1.16E-02	1.11E-02	1.06E-02	1.02E-02	6.96E-03	6.73E-03	6.99E-03	7.38E-03	7.65E-03	8.13E-03	8.59E-03	7.91E-03	6.88E-03	5.89E-03	5.49E-03	4.68E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.57E-03	9.39E-04	6.73E-04	5.32E-04	4.94E-04	1.49E-03	3.41E-03	5.29E-03	5.80E-03	5.53E-03	5.32E-03	5.12E-03	3.48E-03	3.36E-03	3.49E-03	3.69E-03	3.82E-03	4.06E-03	4.30E-03	3.95E-03	3.44E-03	2.94E-03	2.74E-03	2.34E-03
	Emission in each Box of 1st jet	g/s	1.57E-03	9.39E-04	6.73E-04	5.32E-04	4.94E-04	1.49E-03	3.41E-03	5.29E-03	5.80E-03	5.53E-03	5.32E-03	5.12E-03	3.48E-03	3.36E-03	3.49E-03	3.69E-03	3.82E-03	4.06E-03	4.30E-03	3.95E-03	3.44E-03	2.94E-03	2.74E-03	2.34E-03
	Emission in each Box of 2nd jet	g/s	1.57E-03	9.39E-04	6.73E-04	5.32E-04	4.94E-04	1.49E-03	3.41E-03	5.29E-03	5.80E-03	5.53E-03	5.32E-03	5.12E-03	3.48E-03	3.36E-03	3.49E-03	3.69E-03	3.82E-03	4.06E-03	4.30E-03	3.95E-03	3.44E-03	2.94E-03	2.74E-03	2.34E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0019***	***0.0025***	***0.0024***	***0.0023***	***0.0022***	***0.0018***	***0.0018***	***0.0019***	***0.0020***	***0.0020***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.88E-04	3.64E-04	2.61E-04	1.99E-04	1.75E-04	3.13E-04	6.86E-04	1.29E-03	1.68E-03	1.62E-03	1.54E-03	1.46E-03	1.23E-03	1.18E-03	1.24E-03	1.30E-03	1.35E-03	1.44E-03	1.53E-03	1.44E-03	1.22E-03	1.01E-03	9.40E-04	8.18E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.44E-04	1.82E-04	1.30E-04	9.96E-05	8.75E-05	1.56E-04	3.43E-04	6.43E-04	8.41E-04	8.08E-04	7.69E-04	7.31E-04	6.16E-04	5.90E-04	6.20E-04	6.51E-04	6.75E-04	7.19E-04	7.65E-04	7.18E-04	6.12E-04	5.07E-04	4.70E-04	4.09E-04
	Emission in each Box of 1st jet	g/s	2.44E-04	1.82E-04	1.30E-04	9.96E-05	8.75E-05	1.56E-04	3.43E-04	6.43E-04	8.41E-04	8.08E-04	7.69E-04	7.31E-04	6.16E-04	5.90E-04	6.20E-04	6.51E-04	6.75E-04	7.19E-04	7.65E-04	7.18E-04	6.12E-04	5.07E-04	4.70E-04	4.09E-04
	Emission in each Box of 2nd jet	g/s	2.44E-04	1.82E-04	1.30E-04	9.96E-05	8.75E-05	1.56E-04	3.43E-04	6.43E-04	8.41E-04	8.08E-04	7.69E-04	7.31E-04	6.16E-04	5.90E-04	6.20E-04	6.51E-04	6.75E-04	7.19E-04	7.65E-04	7.18E-04	6.12E-04	5.07E-04	4.70E-04	4.09E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1503	0.1122	0.1154	0.1236	0.1318	0.3095	0.3319	0.2255	0.1667	0.1641	0.1652	0.1699	0.1248	0.1264	0.1245	0.1246	0.1249	0.1230	0.1237	0.1205	0.1242	0.1306	0.1302	0.1254
	NO2	g/vehicle/km	0.0230	0.0215	0.0220	0.0227	0.0231	0.0323	0.0332	0.0272	0.0240	0.0237	0.0237	0.0242	0.0220	0.0221	0.0220	0.0219	0.0220	0.0216	0.0219	0.0216	0.0219	0.0223	0.0221	0.0217
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0053***	***0.0032***	***0.0023***	***0.0018***	***0.0016***	***0.0049***	***0.0113***	***0.0182***	***0.0197***	***0.0188***	***0.0174***	***0.0171***	***0.0117***	***0.0111***	***0.0116***	***0.0122***	***0.0128***	***0.0136***	***0.0145***	***0.0135***	***0.0114***	***0.0098***	***0.0092***	***0.0078***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.56E-03	2.14E-03	1.53E-03	1.22E-03	1.09E-03	3.29E-03	7.55E-03	1.21E-02	1.32E-02	1.26E-02	1.16E-02	1.14E-02	7.81E-03	7.40E-03	7.74E-03	8.13E-03	8.54E-03	9.06E-03	9.64E-03	9.01E-03	7.61E-03	6.55E-03	6.11E-03	5.19E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.78E-03	1.07E-03	7.65E-04	6.10E-04	5.45E-04	1.65E-03	3.78E-03	6.07E-03	6.58E-03	6.28E-03	5.80E-03	5.72E-03	3.91E-03	3.70E-03	3.87E-03	4.07E-03	4.27E-03	4.53E-03	4.82E-03	4.51E-03	3.81E-03	3.27E-03	3.05E-03	2.60E-03
	Emission in each Box of 1st jet	g/s	1.78E-03	1.07E-03	7.65E-04	6.10E-04	5.45E-04	1.65E-03	3.78E-03	6.07E-03	6.58E-03	6.28E-03	5.80E-03	5.72E-03	3.91E-03	3.70E-03	3.87E-03	4.07E-03	4.27E-03	4.53E-03	4.82E-03	4.51E-03	3.81E-03	3.27E-03	3.05E-03	2.60E-03
	Emission in each Box of 2nd jet	g/s	1.78E-03	1.07E-03	7.65E-04	6.10E-04	5.45E-04	1.65E-03	3.78E-03	6.07E-03	6.58E-03	6.28E-03	5.80E-03	5.72E-03	3.91E-03	3.70E-03	3.87E-03	4.07E-03	4.27E-03	4.53E-03	4.82E-03	4.51E-03	3.81E-03	3.27E-03	3.05E-03	2.60E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0022***	***0.0028***	***0.0027***	***0.0025***	***0.0024***	***0.0021***	***0.0019***	***0.0020***	***0.0021***	***0.0023***	***0.0024***	***0.0026***	***0.0024***	***0.0020***	***0.0017***	***0.0016***	***0.0013***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.45E-04	4.10E-04	2.92E-04	2.25E-04	1.91E-04	3.43E-04	7.57E-04	1.46E-03	1.89E-03	1.82E-03	1.67E-03	1.63E-03	1.38E-03	1.29E-03	1.37E-03	1.43E-03	1.50E-03	1.59E-03	1.71E-03	1.62E-03	1.34E-03	1.12E-03	1.04E-03	8.99E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.73E-04	2.05E-04	1.46E-04	1.12E-04	9.56E-05	1.72E-04	3.78E-04	7.32E-04	9.46E-04	9.09E-04	8.34E-04	8.13E-04	6.88E-04	6.46E-04	6.83E-04	7.14E-04	7.50E-04	7.95E-04	8.53E-04	8.08E-04	6.70E-04	5.59E-04	5.19E-04	4.49E-04
	Emission in each Box of 1st jet	g/s	2.73E-04	2.05E-04	1.46E-04	1.12E-04	9.56E-05	1.72E-04	3.78E-04	7.32E-04	9.46E-04	9.09E-04	8.34E-04	8.13E-04	6.88E-04	6.46E-04	6.83E-04	7.14E-04	7.50E-04	7.95E-04	8.53E-04	8.08E-04	6.70E-04	5.59E-04	5.19E-04	4.49E-04
	Emission in each Box of 2nd jet	g/s	2.73E-04	2.05E-04	1.46E-04	1.12E-04	9.56E-05	1.72E-04	3.78E-04	7.32E-04	9.46E-04	9.09E-04	8.34E-04	8.13E-04	6.88E-04	6.46E-04	6.83E-04	7.14E-04	7.50E-04	7.95E-04	8.53E-04	8.08E-04	6.70E-04	5.59E-04	5.19E-04	4.49E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1649	0.1250	0.1289	0.1394	0.1493	0.3490	0.3734	0.2532	0.1880	0.1856	0.1868	0.1910	0.1385	0.1403	0.1382	0.1384	0.1381	0.1384	0.1365	0.1349	0.1381	0.1453	0.1450	0.1403
	NO2	g/vehicle/km	0.0251	0.0236	0.0243	0.0253	0.0258	0.0361	0.0372	0.0303	0.0268	0.0267	0.0267	0.0269	0.0242	0.0243	0.0242	0.0241	0.0241	0.0241	0.0239	0.0240	0.0242	0.0246	0.0245	0.0241
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0059***	***0.0036***	***0.0026***	***0.0021***	***0.0019***	***0.0056***	***0.0127***	***0.0205***	***0.0223***	***0.0213***	***0.0197***	***0.0193***	***0.0130***	***0.0123***	***0.0129***	***0.0136***	***0.0142***	***0.0153***	***0.0160***	***0.0151***	***0.0127***	***0.0109***	***0.0102***	***0.0087***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.90E-03	2.39E-03	1.71E-03	1.38E-03	1.24E-03	3.71E-03	8.50E-03	1.36E-02	1.48E-02	1.42E-02	1.31E-02	1.29E-02	8.67E-03	8.22E-03	8.59E-03	9.04E-03	9.44E-03	1.02E-02	1.06E-02	1.01E-02	8.47E-03	7.28E-03	6.80E-03	5.81E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.95E-03	1.19E-03	8.54E-04	6.89E-04	6.18E-04	1.86E-03	4.25E-03	6.82E-03	7.42E-03	7.10E-03	6.56E-03	6.43E-03	4.34E-03	4.11E-03	4.30E-03	4.52E-03	4.72E-03	5.10E-03	5.32E-03	5.04E-03	4.23E-03	3.64E-03	3.40E-03	2.90E-03
	Emission in each Box of 1st jet	g/s	1.95E-03	1.19E-03	8.54E-04	6.89E-04	6.18E-04	1.86E-03	4.25E-03	6.82E-03	7.42E-03	7.10E-03	6.56E-03	6.43E-03	4.34E-03	4.11E-03	4.30E-03	4.52E-03	4.72E-03	5.10E-03	5.32E-03	5.04E-03	4.23E-03	3.64E-03	3.40E-03	2.90E-03
	Emission in each Box of 2nd jet	g/s	1.95E-03	1.19E-03	8.54E-04	6.89E-04	6.18E-04	1.86E-03	4.25E-03	6.82E-03	7.42E-03	7.10E-03	6.56E-03	6.43E-03	4.34E-03	4.11E-03	4.30E-03	4.52E-03	4.72E-03	5.10E-03	5.32E-03	5.04E-03	4.23E-03	3.64E-03	3.40E-03	2.90E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0024***	***0.0032***	***0.0031***	***0.0028***	***0.0027***	***0.0023***	***0.0021***	***0.0023***	***0.0024***	***0.0025***	***0.0027***	***0.0028***	***0.0027***	***0.0022***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.94E-04	4.51E-04	3.22E-04	2.50E-04	2.14E-04	3.84E-04	8.46E-04	1.63E-03	2.12E-03	2.04E-03	1.87E-03	1.81E-03	1.51E-03	1.42E-03	1.50E-03	1.57E-03	1.64E-03	1.77E-03	1.86E-03	1.80E-03	1.48E-03	1.23E-03	1.15E-03	9.98E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.97E-04	2.26E-04	1.61E-04	1.25E-04	1.07E-04	1.92E-04	4.23E-04	8.16E-04	1.06E-03	1.02E-03	9.37E-04	9.06E-04	7.57E-04	7.11E-04	7.51E-04	7.86E-04	8.22E-04	8.87E-04	9.32E-04	8.98E-04	7.40E-04	6.17E-04	5.74E-04	4.99E-04
	Emission in each Box of 1st jet	g/s	2.97E-04	2.26E-04	1.61E-04	1.25E-04	1.07E-04	1.92E-04	4.23E-04	8.16E-04	1.06E-03	1.02E-03	9.37E-04	9.06E-04	7.57E-04	7.11E-04	7.51E-04	7.86E-04	8.22E-04	8.87E-04	9.32E-04	8.98E-04	7.40E-04	6.17E-04	5.74E-04	4.99E-04
	Emission in each Box of 2nd jet	g/s	2.97E-04	2.26E-04	1.61E-04	1.25E-04	1.07E-04	1.92E-04	4.23E-04	8.16E-04	1.06E-03	1.02E-03	9.37E-04	9.06E-04	7.57E-04	7.11E-04	7.51E-04	7.86E-04	8.22E-04	8.87E-04	9.32E-04	8.98E-04	7.40E-04	6.17E-04	5.74E-04	4.99E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3200	3066	2853	2668	2833	2976	3114	3357	3550	3408	2793	2285	2138	1887
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1740	0.1310	0.1353	0.1455	0.1577	0.3653	0.3896	0.2640	0.1962	0.1934	0.1941	0.1988	0.1440	0.1458	0.1440	0.1440	0.1436	0.1435	0.1431	0.1396	0.1435	0.1505	0.1522	0.1472
	NO2	g/vehicle/km	0.0264	0.0246	0.0253	0.0262	0.0270	0.0377	0.0387	0.0315	0.0279	0.0277	0.0277	0.0280	0.0250	0.0251	0.0251	0.0249	0.0249	0.0249	0.0249	0.0248	0.0250	0.0254	0.0255	0.0251
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0136	0.0139	0.0101	0.0102	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0100	0.0106	0.0106	0.0102
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0125	0.0127	0.0092	0.0093	0.0092	0.0093	0.0092	0.0092	0.0091	0.0089	0.0092	0.0097	0.0097	0.0094
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0062***	***0.0038***	***0.0027***	***0.0022***	***0.0020***	***0.0058***	***0.0133***	***0.0213***	***0.0232***	***0.0222***	***0.0204***	***0.0201***	***0.0135***	***0.0128***	***0.0134***	***0.0141***	***0.0147***	***0.0159***	***0.0167***	***0.0157***	***0.0132***	***0.0113***	***0.0107***	***0.0091***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.12E-03	2.50E-03	1.79E-03	1.44E-03	1.30E-03	3.89E-03	8.87E-03	1.42E-02	1.55E-02	1.48E-02	1.36E-02	1.34E-02	9.01E-03	8.54E-03	8.95E-03	9.40E-03	9.81E-03	1.06E-02	1.11E-02	1.04E-02	8.79E-03	7.54E-03	7.14E-03	6.10E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.06E-03	1.25E-03	8.96E-04	7.18E-04	6.52E-04	1.94E-03	4.43E-03	7.11E-03	7.75E-03	7.40E-03	6.81E-03	6.69E-03	4.51E-03	4.27E-03	4.48E-03	4.70E-03	4.91E-03	5.29E-03	5.57E-03	5.22E-03	4.40E-03	3.77E-03	3.57E-03	3.05E-03
	Emission in each Box of 1st jet	g/s	2.06E-03	1.25E-03	8.96E-04	7.18E-04	6.52E-04	1.94E-03	4.43E-03	7.11E-03	7.75E-03	7.40E-03	6.81E-03	6.69E-03	4.51E-03	4.27E-03	4.48E-03	4.70E-03	4.91E-03	5.29E-03	5.57E-03	5.22E-03	4.40E-03	3.77E-03	3.57E-03	3.05E-03
	Emission in each Box of 2nd jet	g/s	2.06E-03	1.25E-03	8.96E-04	7.18E-04	6.52E-04	1.94E-03	4.43E-03	7.11E-03	7.75E-03	7.40E-03	6.81E-03	6.69E-03	4.51E-03	4.27E-03	4.48E-03	4.70E-03	4.91E-03	5.29E-03	5.57E-03	5.22E-03	4.40E-03	3.77E-03	3.57E-03	3.05E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0025***	***0.0033***	***0.0032***	***0.0029***	***0.0028***	***0.0024***	***0.0022***	***0.0023***	***0.0024***	***0.0026***	***0.0028***	***0.0029***	***0.0028***	***0.0023***	***0.0019***	***0.0018***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.24E-04	4.70E-04	3.36E-04	2.59E-04	2.24E-04	4.01E-04	8.80E-04	1.70E-03	2.20E-03	2.12E-03	1.94E-03	1.88E-03	1.57E-03	1.47E-03	1.56E-03	1.63E-03	1.70E-03	1.84E-03	1.94E-03	1.85E-03	1.53E-03	1.27E-03	1.20E-03	1.04E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.12E-04	2.35E-04	1.68E-04	1.29E-04	1.12E-04	2.00E-04	4.40E-04	8.48E-04	1.10E-03	1.06E-03	9.71E-04	9.41E-04	7.83E-04	7.36E-04	7.81E-04	8.14E-04	8.50E-04	9.18E-04	9.72E-04	9.26E-04	7.66E-04	6.37E-04	5.99E-04	5.21E-04
	Emission in each Box of 1st jet	g/s	3.12E-04	2.35E-04	1.68E-04	1.29E-04	1.12E-04	2.00E-04	4.40E-04	8.48E-04	1.10E-03	1.06E-03	9.71E-04	9.41E-04	7.83E-04	7.36E-04	7.81E-04	8.14E-04	8.50E-04	9.18E-04	9.72E-04	9.26E-04	7.66E-04	6.37E-04	5.99E-04	5.21E-04
	Emission in each Box of 2nd jet	g/s	3.12E-04	2.35E-04	1.68E-04	1.29E-04	1.12E-04	2.00E-04	4.40E-04	8.48E-04	1.10E-03	1.06E-03	9.71E-04	9.41E-04	7.83E-04	7.36E-04	7.81E-04	8.14E-04	8.50E-04	9.18E-04	9.72E-04	9.26E-04	7.66E-04	6.37E-04	5.99E-04	5.21E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.43E-03***	***1.40E-03***	***9.47E-04***	***8.97E-04***	***9.38E-04***	***9.91E-04***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.22E-04***	***7.94E-04***	***7.45E-04***	***6.36E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.55E-04	9.32E-04	6.31E-04	5.98E-04	6.25E-04	6.61E-04	6.90E-04	7.42E-04	7.76E-04	7.28E-04	6.15E-04	5.29E-04	4.97E-04	4.24E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.78E-04	4.66E-04	3.16E-04	2.99E-04	3.13E-04	3.30E-04	3.45E-04	3.71E-04	3.88E-04	3.64E-04	3.07E-04	2.65E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.31E-03***	***1.28E-03***	***8.66E-04***	***8.20E-04***	***8.58E-04***	***9.07E-04***	***9.46E-04***	***1.02E-03***	***1.07E-03***	***9.98E-04***	***8.44E-04***	***7.27E-04***	***6.82E-04***	***5.82E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.75E-04	8.54E-04	5.77E-04	5.47E-04	5.72E-04	6.05E-04	6.31E-04	6.79E-04	7.10E-04	6.66E-04	5.62E-04	4.84E-04	4.55E-04	3.88E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.37E-04	4.27E-04	2.89E-04	2.73E-04	2.86E-04	3.02E-04	3.15E-04	3.39E-04	3.55E-04	3.33E-04	2.81E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1623	0.1223	0.1253	0.1392	0.1488	0.3491	0.3764	0.2487	0.1852	0.1827	0.1839	0.1867	0.1512	0.1531	0.1496	0.1504	0.1502	0.1504	0.1488	0.1446	0.1486	0.1584	0.1593	0.1531
	NO2	g/vehicle/km	0.0239	0.0223	0.0227	0.0239	0.0243	0.0353	0.0366	0.0289	0.0256	0.0254	0.0255	0.0256	0.0249	0.0250	0.0246	0.0248	0.0247	0.0246	0.0245	0.0243	0.0245	0.0251	0.0250	0.0246
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0117***	***0.0071***	***0.0051***	***0.0042***	***0.0038***	***0.0112***	***0.0258***	***0.0407***	***0.0447***	***0.0427***	***0.0394***	***0.0384***	***0.0272***	***0.0258***	***0.0267***	***0.0282***	***0.0295***	***0.0318***	***0.0332***	***0.0310***	***0.0261***	***0.0228***	***0.0215***	***0.0182***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.83E-03	4.77E-03	3.38E-03	2.81E-03	2.51E-03	7.46E-03	1.72E-02	2.71E-02	2.98E-02	2.85E-02	2.63E-02	2.56E-02	1.81E-02	1.72E-02	1.78E-02	1.88E-02	1.96E-02	2.12E-02	2.22E-02	2.07E-02	1.74E-02	1.52E-02	1.43E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.91E-03	2.38E-03	1.69E-03	1.40E-03	1.25E-03	3.73E-03	8.60E-03	1.36E-02	1.49E-02	1.42E-02	1.31E-02	1.28E-02	9.06E-03	8.59E-03	8.90E-03	9.39E-03	9.82E-03	1.06E-02	1.11E-02	1.03E-02	8.72E-03	7.61E-03	7.15E-03	6.07E-03
	Emission in each Box of 1st jet	g/s	2.61E-03	1.59E-03	1.13E-03	9.36E-04	8.37E-04	2.49E-03	5.73E-03	9.05E-03	9.92E-03	9.49E-03	8.76E-03	8.52E-03	6.04E-03	5.72E-03	5.94E-03	6.26E-03	6.55E-03	7.06E-03	7.39E-03	6.89E-03	5.81E-03	5.08E-03	4.77E-03	4.05E-03
	Emission in each Box of 2nd jet	g/s	1.30E-03	7.94E-04	5.63E-04	4.68E-04	4.18E-04	1.24E-03	2.87E-03	4.52E-03	4.96E-03	4.75E-03	4.38E-03	4.26E-03	3.02E-03	2.86E-03	2.97E-03	3.13E-03	3.27E-03	3.53E-03	3.69E-03	3.45E-03	2.91E-03	2.54E-03	2.38E-03	2.02E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0025***	***0.0047***	***0.0062***	***0.0059***	***0.0055***	***0.0053***	***0.0045***	***0.0042***	***0.0044***	***0.0046***	***0.0049***	***0.0052***	***0.0055***	***0.0052***	***0.0043***	***0.0036***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.15E-03	8.69E-04	6.13E-04	4.82E-04	4.09E-04	7.55E-04	1.67E-03	3.15E-03	4.11E-03	3.96E-03	3.64E-03	3.51E-03	2.99E-03	2.80E-03	2.93E-03	3.09E-03	3.23E-03	3.47E-03	3.65E-03	3.47E-03	2.88E-03	2.41E-03	2.25E-03	1.95E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.77E-04	4.34E-04	3.06E-04	2.41E-04	2.04E-04	3.77E-04	8.36E-04	1.58E-03	2.06E-03	1.98E-03	1.82E-03	1.75E-03	1.49E-03	1.40E-03	1.47E-03	1.55E-03	1.62E-03	1.73E-03	1.83E-03	1.74E-03	1.44E-03	1.21E-03	1.12E-03	9.75E-04
	Emission in each Box of 1st jet	g/s	3.84E-04	2.90E-04	2.04E-04	1.61E-04	1.36E-04	2.52E-04	5.57E-04	1.05E-03	1.37E-03	1.32E-03	1.21E-03	1.17E-03	9.96E-04	9.34E-04	9.77E-04	1.03E-03	1.08E-03	1.16E-03	1.22E-03	1.16E-03	9.60E-04	8.04E-04	7.50E-04	6.50E-04
	Emission in each Box of 2nd jet	g/s	1.92E-04	1.45E-04	1.02E-04	8.04E-05	6.81E-05	1.26E-04	2.79E-04	5.25E-04	6.85E-04	6.61E-04	6.07E-04	5.85E-04	4.98E-04	4.67E-04	4.89E-04	5.16E-04	5.39E-04	5.78E-04	6.08E-04	5.79E-04	4.80E-04	4.02E-04	3.75E-04	3.25E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1515	0.1127	0.1151	0.1295	0.1384	0.3264	0.3488	0.2327	0.1712	0.1667	0.1691	0.1717	0.1388	0.1418	0.1396	0.1391	0.1387	0.1396	0.1379	0.1351	0.1388	0.1483	0.1474	0.1416
	NO2	g/vehicle/km	0.0225	0.0208	0.0212	0.0225	0.0228	0.0332	0.0341	0.0271	0.0238	0.0235	0.0237	0.0238	0.0231	0.0233	0.0232	0.0231	0.0231	0.0231	0.0230	0.0229	0.0231	0.0236	0.0234	0.0230
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0110***	***0.0066***	***0.0047***	***0.0039***	***0.0035***	***0.0105***	***0.0239***	***0.0381***	***0.0413***	***0.0390***	***0.0362***	***0.0353***	***0.0250***	***0.0239***	***0.0249***	***0.0261***	***0.0272***	***0.0295***	***0.0308***	***0.0290***	***0.0244***	***0.0214***	***0.0199***	***0.0168***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.31E-03	4.39E-03	3.10E-03	2.61E-03	2.33E-03	6.97E-03	1.59E-02	2.54E-02	2.75E-02	2.60E-02	2.42E-02	2.35E-02	1.66E-02	1.59E-02	1.66E-02	1.74E-02	1.81E-02	1.97E-02	2.05E-02	1.93E-02	1.63E-02	1.43E-02	1.32E-02	1.12E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.65E-03	2.20E-03	1.55E-03	1.31E-03	1.17E-03	3.49E-03	7.97E-03	1.27E-02	1.38E-02	1.30E-02	1.21E-02	1.18E-02	8.32E-03	7.95E-03	8.31E-03	8.69E-03	9.07E-03	9.83E-03	1.03E-02	9.66E-03	8.14E-03	7.13E-03	6.62E-03	5.61E-03
	Emission in each Box of 1st jet	g/s	2.44E-03	1.46E-03	1.03E-03	8.71E-04	7.78E-04	2.32E-03	5.31E-03	8.46E-03	9.18E-03	8.66E-03	8.05E-03	7.84E-03	5.55E-03	5.30E-03	5.54E-03	5.79E-03	6.05E-03	6.55E-03	6.85E-03	6.44E-03	5.43E-03	4.75E-03	4.41E-03	3.74E-03
	Emission in each Box of 2nd jet	g/s	1.22E-03	7.32E-04	5.17E-04	4.36E-04	3.89E-04	1.16E-03	2.66E-03	4.23E-03	4.59E-03	4.33E-03	4.03E-03	3.92E-03	2.77E-03	2.65E-03	2.77E-03	2.90E-03	3.02E-03	3.28E-03	3.42E-03	3.22E-03	2.71E-03	2.38E-03	2.21E-03	1.87E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0023***	***0.0044***	***0.0058***	***0.0055***	***0.0051***	***0.0049***	***0.0042***	***0.0039***	***0.0041***	***0.0043***	***0.0045***	***0.0049***	***0.0051***	***0.0049***	***0.0041***	***0.0034***	***0.0032***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.08E-03	8.12E-04	5.72E-04	4.54E-04	3.85E-04	7.09E-04	1.56E-03	2.96E-03	3.83E-03	3.66E-03	3.38E-03	3.25E-03	2.77E-03	2.62E-03	2.76E-03	2.88E-03	3.01E-03	3.25E-03	3.42E-03	3.27E-03	2.71E-03	2.27E-03	2.10E-03	1.82E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.42E-04	4.06E-04	2.86E-04	2.27E-04	1.92E-04	3.55E-04	7.79E-04	1.48E-03	1.92E-03	1.83E-03	1.69E-03	1.63E-03	1.38E-03	1.31E-03	1.38E-03	1.44E-03	1.51E-03	1.62E-03	1.71E-03	1.64E-03	1.35E-03	1.14E-03	1.05E-03	9.11E-04
	Emission in each Box of 1st jet	g/s	3.62E-04	2.71E-04	1.91E-04	1.51E-04	1.28E-04	2.36E-04	5.19E-04	9.87E-04	1.28E-03	1.22E-03	1.13E-03	1.08E-03	9.23E-04	8.72E-04	9.21E-04	9.61E-04	1.00E-03	1.08E-03	1.14E-03	1.09E-03	9.03E-04	7.58E-04	7.01E-04	6.07E-04
	Emission in each Box of 2nd jet	g/s	1.81E-04	1.35E-04	9.53E-05	7.57E-05	6.41E-05	1.18E-04	2.60E-04	4.94E-04	6.39E-04	6.10E-04	5.63E-04	5.42E-04	4.62E-04	4.36E-04	4.60E-04	4.80E-04	5.02E-04	5.41E-04	5.70E-04	5.46E-04	4.52E-04	3.79E-04	3.50E-04	3.04E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1427	0.1061	0.1085	0.1202	0.1286	0.3057	0.3276	0.2187	0.1611	0.1584	0.1589	0.1636	0.1323	0.1330	0.1309	0.1320	0.1303	0.1317	0.1311	0.1272	0.1302	0.1392	0.1383	0.1331
	NO2	g/vehicle/km	0.0214	0.0198	0.0202	0.0212	0.0215	0.0313	0.0322	0.0257	0.0226	0.0224	0.0224	0.0227	0.0221	0.0220	0.0218	0.0220	0.0217	0.0219	0.0219	0.0217	0.0218	0.0223	0.0221	0.0217
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0103***	***0.0062***	***0.0044***	***0.0036***	***0.0033***	***0.0098***	***0.0225***	***0.0358***	***0.0388***	***0.0371***	***0.0340***	***0.0336***	***0.0238***	***0.0224***	***0.0234***	***0.0247***	***0.0256***	***0.0278***	***0.0293***	***0.0273***	***0.0229***	***0.0201***	***0.0186***	***0.0158***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.88E-03	4.13E-03	2.92E-03	2.43E-03	2.17E-03	6.53E-03	1.50E-02	2.39E-02	2.59E-02	2.47E-02	2.27E-02	2.24E-02	1.59E-02	1.49E-02	1.56E-02	1.65E-02	1.70E-02	1.86E-02	1.95E-02	1.82E-02	1.53E-02	1.34E-02	1.24E-02	1.06E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.44E-03	2.07E-03	1.46E-03	1.21E-03	1.08E-03	3.27E-03	7.49E-03	1.19E-02	1.29E-02	1.24E-02	1.13E-02	1.12E-02	7.93E-03	7.46E-03	7.79E-03	8.24E-03	8.52E-03	9.28E-03	9.76E-03	9.09E-03	7.63E-03	6.69E-03	6.21E-03	5.28E-03
	Emission in each Box of 1st jet	g/s	2.29E-03	1.38E-03	9.75E-04	8.09E-04	7.23E-04	2.18E-03	4.99E-03	7.96E-03	8.63E-03	8.23E-03	7.57E-03	7.47E-03	5.28E-03	4.97E-03	5.20E-03	5.50E-03	5.68E-03	6.18E-03	6.51E-03	6.06E-03	5.09E-03	4.46E-03	4.14E-03	3.52E-03
	Emission in each Box of 2nd jet	g/s	1.15E-03	6.89E-04	4.87E-04	4.04E-04	3.61E-04	1.09E-03	2.50E-03	3.98E-03	4.32E-03	4.12E-03	3.78E-03	3.73E-03	2.64E-03	2.49E-03	2.60E-03	2.75E-03	2.84E-03	3.09E-03	3.25E-03	3.03E-03	2.54E-03	2.23E-03	2.07E-03	1.76E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0010***	***0.0022***	***0.0042***	***0.0055***	***0.0052***	***0.0048***	***0.0047***	***0.0040***	***0.0037***	***0.0039***	***0.0041***	***0.0043***	***0.0046***	***0.0049***	***0.0047***	***0.0038***	***0.0032***	***0.0030***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.03E-03	7.74E-04	5.46E-04	4.28E-04	3.63E-04	6.69E-04	1.47E-03	2.81E-03	3.64E-03	3.49E-03	3.19E-03	3.11E-03	2.65E-03	2.46E-03	2.60E-03	2.75E-03	2.84E-03	3.08E-03	3.27E-03	3.11E-03	2.56E-03	2.15E-03	1.98E-03	1.72E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.16E-04	3.87E-04	2.73E-04	2.14E-04	1.81E-04	3.35E-04	7.36E-04	1.40E-03	1.82E-03	1.75E-03	1.60E-03	1.56E-03	1.33E-03	1.23E-03	1.30E-03	1.38E-03	1.42E-03	1.54E-03	1.63E-03	1.55E-03	1.28E-03	1.07E-03	9.91E-04	8.61E-04
	Emission in each Box of 1st jet	g/s	3.44E-04	2.58E-04	1.82E-04	1.43E-04	1.21E-04	2.23E-04	4.91E-04	9.35E-04	1.21E-03	1.16E-03	1.06E-03	1.04E-03	8.84E-04	8.21E-04	8.66E-04	9.18E-04	9.47E-04	1.03E-03	1.09E-03	1.04E-03	8.52E-04	7.15E-04	6.61E-04	5.74E-04
	Emission in each Box of 2nd jet	g/s	1.72E-04	1.29E-04	9.09E-05	7.14E-05	6.04E-05	1.12E-04	2.45E-04	4.68E-04	6.06E-04	5.82E-04	5.32E-04	5.19E-04	4.42E-04	4.10E-04	4.33E-04	4.59E-04	4.74E-04	5.14E-04	5.45E-04	5.18E-04	4.26E-04	3.58E-04	3.30E-04	2.87E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1339	0.0992	0.1010	0.1148	0.1228	0.2940	0.3152	0.2082	0.1532	0.1508	0.1511	0.1554	0.1256	0.1284	0.1265	0.1252	0.1261	0.1252	0.1246	0.1202	0.1233	0.1340	0.1326	0.1272
	NO2	g/vehicle/km	0.0201	0.0187	0.0190	0.0204	0.0206	0.0302	0.0310	0.0245	0.0216	0.0214	0.0213	0.0216	0.0211	0.0213	0.0211	0.0209	0.0211	0.0209	0.0209	0.0206	0.0208	0.0216	0.0213	0.0208
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0097***	***0.0058***	***0.0041***	***0.0035***	***0.0031***	***0.0094***	***0.0216***	***0.0341***	***0.0370***	***0.0353***	***0.0324***	***0.0319***	***0.0226***	***0.0216***	***0.0226***	***0.0235***	***0.0247***	***0.0264***	***0.0278***	***0.0258***	***0.0217***	***0.0193***	***0.0179***	***0.0151***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.46E-03	3.87E-03	2.72E-03	2.32E-03	2.07E-03	6.28E-03	1.44E-02	2.27E-02	2.46E-02	2.35E-02	2.16E-02	2.13E-02	1.50E-02	1.44E-02	1.51E-02	1.56E-02	1.65E-02	1.76E-02	1.86E-02	1.72E-02	1.45E-02	1.29E-02	1.19E-02	1.01E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.23E-03	1.93E-03	1.36E-03	1.16E-03	1.04E-03	3.14E-03	7.20E-03	1.14E-02	1.23E-02	1.18E-02	1.08E-02	1.06E-02	7.52E-03	7.20E-03	7.53E-03	7.82E-03	8.25E-03	8.82E-03	9.28E-03	8.59E-03	7.23E-03	6.44E-03	5.95E-03	5.04E-03
	Emission in each Box of 1st jet	g/s	2.15E-03	1.29E-03	9.07E-04	7.72E-04	6.90E-04	2.09E-03	4.80E-03	7.57E-03	8.21E-03	7.84E-03	7.20E-03	7.09E-03	5.01E-03	4.80E-03	5.02E-03	5.21E-03	5.50E-03	5.88E-03	6.18E-03	5.73E-03	4.82E-03	4.30E-03	3.97E-03	3.36E-03
	Emission in each Box of 2nd jet	g/s	1.08E-03	6.44E-04	4.54E-04	3.86E-04	3.45E-04	1.05E-03	2.40E-03	3.79E-03	4.11E-03	3.92E-03	3.60E-03	3.55E-03	2.51E-03	2.40E-03	2.51E-03	2.61E-03	2.75E-03	2.94E-03	3.09E-03	2.86E-03	2.41E-03	2.15E-03	1.98E-03	1.68E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0010***	***0.0021***	***0.0040***	***0.0052***	***0.0050***	***0.0046***	***0.0044***	***0.0038***	***0.0036***	***0.0038***	***0.0039***	***0.0041***	***0.0044***	***0.0047***	***0.0044***	***0.0037***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.72E-04	7.29E-04	5.12E-04	4.11E-04	3.48E-04	6.45E-04	1.42E-03	2.68E-03	3.47E-03	3.33E-03	3.04E-03	2.96E-03	2.52E-03	2.38E-03	2.52E-03	2.61E-03	2.76E-03	2.94E-03	3.11E-03	2.95E-03	2.44E-03	2.07E-03	1.91E-03	1.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.86E-04	3.64E-04	2.56E-04	2.05E-04	1.74E-04	3.22E-04	7.09E-04	1.34E-03	1.73E-03	1.67E-03	1.52E-03	1.48E-03	1.26E-03	1.19E-03	1.26E-03	1.31E-03	1.38E-03	1.47E-03	1.56E-03	1.47E-03	1.22E-03	1.04E-03	9.55E-04	8.26E-04
	Emission in each Box of 1st jet	g/s	3.24E-04	2.43E-04	1.71E-04	1.37E-04	1.16E-04	2.15E-04	4.73E-04	8.92E-04	1.16E-03	1.11E-03	1.01E-03	9.87E-04	8.41E-04	7.95E-04	8.39E-04	8.72E-04	9.20E-04	9.79E-04	1.04E-03	9.83E-04	8.12E-04	6.91E-04	6.36E-04	5.51E-04
	Emission in each Box of 2nd jet	g/s	1.62E-04	1.21E-04	8.53E-05	6.85E-05	5.80E-05	1.07E-04	2.36E-04	4.46E-04	5.78E-04	5.55E-04	5.07E-04	4.93E-04	4.20E-04	3.97E-04	4.19E-04	4.36E-04	4.60E-04	4.90E-04	5.19E-04	4.91E-04	4.06E-04	3.46E-04	3.18E-04	2.75E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1201	0.0880	0.0899	0.0995	0.1066	0.2564	0.2716	0.1807	0.1345	0.1317	0.1343	0.1378	0.1121	0.1141	0.1131	0.1115	0.1120	0.1128	0.1093	0.1075	0.1100	0.1164	0.1160	0.1111
	NO2	g/vehicle/km	0.0183	0.0169	0.0172	0.0179	0.0182	0.0265	0.0270	0.0215	0.0191	0.0189	0.0191	0.0193	0.0189	0.0191	0.0191	0.0188	0.0189	0.0189	0.0186	0.0186	0.0187	0.0189	0.0188	0.0184
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0087***	***0.0051***	***0.0036***	***0.0030***	***0.0027***	***0.0082***	***0.0186***	***0.0296***	***0.0324***	***0.0308***	***0.0288***	***0.0283***	***0.0201***	***0.0192***	***0.0202***	***0.0209***	***0.0220***	***0.0238***	***0.0244***	***0.0231***	***0.0194***	***0.0168***	***0.0156***	***0.0132***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.79E-03	3.43E-03	2.42E-03	2.01E-03	1.80E-03	5.48E-03	1.24E-02	1.97E-02	2.16E-02	2.05E-02	1.92E-02	1.89E-02	1.34E-02	1.28E-02	1.35E-02	1.39E-02	1.46E-02	1.59E-02	1.63E-02	1.54E-02	1.29E-02	1.12E-02	1.04E-02	8.80E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.90E-03	1.72E-03	1.21E-03	1.00E-03	8.98E-04	2.74E-03	6.21E-03	9.86E-03	1.08E-02	1.03E-02	9.59E-03	9.43E-03	6.71E-03	6.40E-03	6.73E-03	6.96E-03	7.32E-03	7.94E-03	8.14E-03	7.68E-03	6.45E-03	5.59E-03	5.21E-03	4.40E-03
	Emission in each Box of 1st jet	g/s	1.93E-03	1.14E-03	8.07E-04	6.69E-04	5.99E-04	1.83E-03	4.14E-03	6.57E-03	7.21E-03	6.84E-03	6.40E-03	6.29E-03	4.48E-03	4.26E-03	4.49E-03	4.64E-03	4.88E-03	5.30E-03	5.43E-03	5.12E-03	4.30E-03	3.73E-03	3.47E-03	2.93E-03
	Emission in each Box of 2nd jet	g/s	9.66E-04	5.72E-04	4.04E-04	3.35E-04	2.99E-04	9.13E-04	2.07E-03	3.29E-03	3.60E-03	3.42E-03	3.20E-03	3.14E-03	2.24E-03	2.13E-03	2.24E-03	2.32E-03	2.44E-03	2.65E-03	2.71E-03	2.56E-03	2.15E-03	1.86E-03	1.74E-03	1.47E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0035***	***0.0046***	***0.0044***	***0.0041***	***0.0040***	***0.0034***	***0.0032***	***0.0034***	***0.0035***	***0.0037***	***0.0040***	***0.0041***	***0.0040***	***0.0033***	***0.0027***	***0.0025***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.81E-04	6.57E-04	4.64E-04	3.62E-04	3.06E-04	5.67E-04	1.23E-03	2.34E-03	3.07E-03	2.94E-03	2.73E-03	2.65E-03	2.27E-03	2.14E-03	2.27E-03	2.35E-03	2.47E-03	2.67E-03	2.77E-03	2.66E-03	2.20E-03	1.82E-03	1.68E-03	1.46E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.40E-04	3.29E-04	2.32E-04	1.81E-04	1.53E-04	2.83E-04	6.16E-04	1.17E-03	1.54E-03	1.47E-03	1.36E-03	1.32E-03	1.13E-03	1.07E-03	1.14E-03	1.17E-03	1.24E-03	1.33E-03	1.38E-03	1.33E-03	1.10E-03	9.09E-04	8.42E-04	7.28E-04
	Emission in each Box of 1st jet	g/s	2.94E-04	2.19E-04	1.55E-04	1.21E-04	1.02E-04	1.89E-04	4.11E-04	7.81E-04	1.02E-03	9.80E-04	9.09E-04	8.83E-04	7.57E-04	7.13E-04	7.57E-04	7.83E-04	8.25E-04	8.90E-04	9.22E-04	8.88E-04	7.33E-04	6.06E-04	5.62E-04	4.85E-04
	Emission in each Box of 2nd jet	g/s	1.47E-04	1.10E-04	7.73E-05	6.03E-05	5.11E-05	9.44E-05	2.05E-04	3.91E-04	5.12E-04	4.90E-04	4.55E-04	4.41E-04	3.78E-04	3.56E-04	3.79E-04	3.92E-04	4.12E-04	4.45E-04	4.61E-04	4.44E-04	3.66E-04	3.03E-04	2.81E-04	2.43E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1159	0.0854	0.0895	0.0989	0.1053	0.2536	0.2653	0.1786	0.1315	0.1314	0.1300	0.1333	0.1076	0.1103	0.1079	0.1078	0.1101	0.1099	0.1073	0.1062	0.1088	0.1156	0.1146	0.1104
	NO2	g/vehicle/km	0.0176	0.0163	0.0171	0.0179	0.0180	0.0262	0.0264	0.0212	0.0187	0.0188	0.0185	0.0187	0.0182	0.0185	0.0182	0.0182	0.0186	0.0185	0.0183	0.0184	0.0185	0.0188	0.0186	0.0183
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0084***	***0.0050***	***0.0036***	***0.0030***	***0.0027***	***0.0081***	***0.0182***	***0.0292***	***0.0317***	***0.0307***	***0.0279***	***0.0274***	***0.0193***	***0.0185***	***0.0193***	***0.0202***	***0.0216***	***0.0232***	***0.0240***	***0.0228***	***0.0191***	***0.0167***	***0.0154***	***0.0131***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.59E-03	3.33E-03	2.41E-03	2.00E-03	1.78E-03	5.42E-03	1.21E-02	1.95E-02	2.11E-02	2.05E-02	1.86E-02	1.83E-02	1.29E-02	1.24E-02	1.28E-02	1.35E-02	1.44E-02	1.55E-02	1.60E-02	1.52E-02	1.28E-02	1.11E-02	1.03E-02	8.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.80E-03	1.66E-03	1.21E-03	9.98E-04	8.88E-04	2.71E-03	6.06E-03	9.74E-03	1.06E-02	1.02E-02	9.28E-03	9.13E-03	6.45E-03	6.18E-03	6.42E-03	6.73E-03	7.20E-03	7.74E-03	7.99E-03	7.60E-03	6.38E-03	5.56E-03	5.15E-03	4.38E-03
	Emission in each Box of 1st jet	g/s	1.86E-03	1.11E-03	8.04E-04	6.65E-04	5.92E-04	1.81E-03	4.04E-03	6.49E-03	7.05E-03	6.83E-03	6.19E-03	6.09E-03	4.30E-03	4.12E-03	4.28E-03	4.49E-03	4.80E-03	5.16E-03	5.32E-03	5.06E-03	4.25E-03	3.71E-03	3.43E-03	2.92E-03
	Emission in each Box of 2nd jet	g/s	9.32E-04	5.55E-04	4.02E-04	3.33E-04	2.96E-04	9.03E-04	2.02E-03	3.25E-03	3.52E-03	3.41E-03	3.09E-03	3.04E-03	2.15E-03	2.06E-03	2.14E-03	2.24E-03	2.40E-03	2.58E-03	2.66E-03	2.53E-03	2.13E-03	1.85E-03	1.72E-03	1.46E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0035***	***0.0045***	***0.0044***	***0.0040***	***0.0038***	***0.0033***	***0.0031***	***0.0033***	***0.0034***	***0.0037***	***0.0039***	***0.0041***	***0.0040***	***0.0033***	***0.0027***	***0.0025***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.50E-04	6.37E-04	4.60E-04	3.60E-04	3.03E-04	5.61E-04	1.21E-03	2.31E-03	3.01E-03	2.94E-03	2.64E-03	2.56E-03	2.18E-03	2.08E-03	2.17E-03	2.27E-03	2.44E-03	2.61E-03	2.72E-03	2.63E-03	2.17E-03	1.81E-03	1.67E-03	1.45E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.25E-04	3.19E-04	2.30E-04	1.80E-04	1.52E-04	2.80E-04	6.03E-04	1.16E-03	1.51E-03	1.47E-03	1.32E-03	1.28E-03	1.09E-03	1.04E-03	1.09E-03	1.14E-03	1.22E-03	1.31E-03	1.36E-03	1.32E-03	1.08E-03	9.05E-04	8.33E-04	7.24E-04
	Emission in each Box of 1st jet	g/s	2.83E-04	2.12E-04	1.53E-04	1.20E-04	1.01E-04	1.87E-04	4.02E-04	7.71E-04	1.00E-03	9.79E-04	8.80E-04	8.55E-04	7.28E-04	6.92E-04	7.24E-04	7.58E-04	8.13E-04	8.70E-04	9.06E-04	8.78E-04	7.22E-04	6.03E-04	5.56E-04	4.82E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	1.06E-04	7.66E-05	6.00E-05	5.05E-05	9.35E-05	2.01E-04	3.85E-04	5.02E-04	4.90E-04	4.40E-04	4.27E-04	3.64E-04	3.46E-04	3.62E-04	3.79E-04	4.06E-04	4.35E-04	4.53E-04	4.39E-04	3.61E-04	3.02E-04	2.78E-04	2.41E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1166	0.0848	0.0866	0.0957	0.1025	0.2457	0.2653	0.1740	0.1283	0.1270	0.1304	0.1348	0.1056	0.1084	0.1092	0.1083	0.1081	0.1096	0.1061	0.1050	0.1067	0.1142	0.1132	0.1076
	NO2	g/vehicle/km	0.0177	0.0162	0.0166	0.0173	0.0176	0.0255	0.0264	0.0207	0.0183	0.0182	0.0186	0.0190	0.0179	0.0181	0.0185	0.0183	0.0183	0.0185	0.0181	0.0182	0.0182	0.0186	0.0183	0.0178
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0084***	***0.0050***	***0.0035***	***0.0029***	***0.0026***	***0.0079***	***0.0182***	***0.0285***	***0.0309***	***0.0297***	***0.0280***	***0.0277***	***0.0190***	***0.0182***	***0.0195***	***0.0203***	***0.0212***	***0.0231***	***0.0237***	***0.0225***	***0.0188***	***0.0165***	***0.0152***	***0.0128***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.63E-03	3.31E-03	2.33E-03	1.93E-03	1.73E-03	5.25E-03	1.21E-02	1.90E-02	2.06E-02	1.98E-02	1.86E-02	1.85E-02	1.27E-02	1.22E-02	1.30E-02	1.35E-02	1.41E-02	1.54E-02	1.58E-02	1.50E-02	1.25E-02	1.10E-02	1.02E-02	8.52E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.81E-03	1.65E-03	1.17E-03	9.65E-04	8.64E-04	2.62E-03	6.06E-03	9.49E-03	1.03E-02	9.90E-03	9.32E-03	9.23E-03	6.33E-03	6.08E-03	6.50E-03	6.77E-03	7.07E-03	7.72E-03	7.90E-03	7.51E-03	6.26E-03	5.49E-03	5.08E-03	4.26E-03
	Emission in each Box of 1st jet	g/s	1.88E-03	1.10E-03	7.78E-04	6.44E-04	5.76E-04	1.75E-03	4.04E-03	6.33E-03	6.88E-03	6.60E-03	6.21E-03	6.16E-03	4.22E-03	4.05E-03	4.33E-03	4.51E-03	4.71E-03	5.14E-03	5.27E-03	5.00E-03	4.17E-03	3.66E-03	3.39E-03	2.84E-03
	Emission in each Box of 2nd jet	g/s	9.38E-04	5.51E-04	3.89E-04	3.22E-04	2.88E-04	8.75E-04	2.02E-03	3.16E-03	3.44E-03	3.30E-03	3.11E-03	3.08E-03	2.11E-03	2.03E-03	2.17E-03	2.26E-03	2.36E-03	2.57E-03	2.63E-03	2.50E-03	2.09E-03	1.83E-03	1.69E-03	1.42E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0008***	***0.0018***	***0.0034***	***0.0044***	***0.0043***	***0.0040***	***0.0039***	***0.0032***	***0.0031***	***0.0033***	***0.0034***	***0.0036***	***0.0039***	***0.0040***	***0.0039***	***0.0032***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.53E-04	6.33E-04	4.46E-04	3.50E-04	2.96E-04	5.45E-04	1.21E-03	2.26E-03	2.93E-03	2.84E-03	2.66E-03	2.60E-03	2.14E-03	2.03E-03	2.20E-03	2.29E-03	2.39E-03	2.60E-03	2.69E-03	2.61E-03	2.13E-03	1.79E-03	1.65E-03	1.41E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.27E-04	3.16E-04	2.23E-04	1.75E-04	1.48E-04	2.72E-04	6.03E-04	1.13E-03	1.47E-03	1.42E-03	1.33E-03	1.30E-03	1.07E-03	1.02E-03	1.10E-03	1.14E-03	1.20E-03	1.30E-03	1.34E-03	1.30E-03	1.07E-03	8.94E-04	8.24E-04	7.07E-04
	Emission in each Box of 1st jet	g/s	2.84E-04	2.11E-04	1.49E-04	1.17E-04	9.87E-05	1.82E-04	4.02E-04	7.53E-04	9.78E-04	9.48E-04	8.86E-04	8.66E-04	7.15E-04	6.78E-04	7.34E-04	7.63E-04	7.98E-04	8.67E-04	8.96E-04	8.69E-04	7.11E-04	5.96E-04	5.49E-04	4.71E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	1.05E-04	7.44E-05	5.83E-05	4.94E-05	9.08E-05	2.01E-04	3.76E-04	4.89E-04	4.74E-04	4.43E-04	4.33E-04	3.57E-04	3.39E-04	3.67E-04	3.82E-04	3.99E-04	4.34E-04	4.48E-04	4.34E-04	3.55E-04	2.98E-04	2.75E-04	2.36E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1181	0.0866	0.0884	0.0977	0.1047	0.2509	0.2706	0.1786	0.1299	0.1274	0.1326	0.1351	0.1076	0.1103	0.1085	0.1078	0.1108	0.1092	0.1093	0.1050	0.1068	0.1142	0.1132	0.1091
	NO2	g/vehicle/km	0.0179	0.0165	0.0169	0.0177	0.0179	0.0260	0.0269	0.0212	0.0185	0.0183	0.0189	0.0190	0.0182	0.0185	0.0184	0.0182	0.0188	0.0184	0.0186	0.0182	0.0182	0.0186	0.0184	0.0181
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0085***	***0.0051***	***0.0036***	***0.0030***	***0.0026***	***0.0080***	***0.0186***	***0.0292***	***0.0313***	***0.0298***	***0.0284***	***0.0278***	***0.0193***	***0.0185***	***0.0194***	***0.0202***	***0.0217***	***0.0231***	***0.0244***	***0.0225***	***0.0188***	***0.0165***	***0.0153***	***0.0130***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.70E-03	3.38E-03	2.38E-03	1.97E-03	1.76E-03	5.36E-03	1.24E-02	1.95E-02	2.09E-02	1.99E-02	1.89E-02	1.85E-02	1.29E-02	1.24E-02	1.29E-02	1.35E-02	1.45E-02	1.54E-02	1.63E-02	1.50E-02	1.25E-02	1.10E-02	1.02E-02	8.65E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.85E-03	1.69E-03	1.19E-03	9.86E-04	8.82E-04	2.68E-03	6.19E-03	9.74E-03	1.04E-02	9.94E-03	9.47E-03	9.25E-03	6.45E-03	6.18E-03	6.46E-03	6.73E-03	7.24E-03	7.69E-03	8.13E-03	7.51E-03	6.26E-03	5.49E-03	5.08E-03	4.32E-03
	Emission in each Box of 1st jet	g/s	1.90E-03	1.13E-03	7.94E-04	6.57E-04	5.88E-04	1.79E-03	4.12E-03	6.49E-03	6.96E-03	6.62E-03	6.31E-03	6.17E-03	4.30E-03	4.12E-03	4.31E-03	4.49E-03	4.83E-03	5.13E-03	5.42E-03	5.00E-03	4.18E-03	3.66E-03	3.39E-03	2.88E-03
	Emission in each Box of 2nd jet	g/s	9.50E-04	5.63E-04	3.97E-04	3.29E-04	2.94E-04	8.93E-04	2.06E-03	3.25E-03	3.48E-03	3.31E-03	3.16E-03	3.08E-03	2.15E-03	2.06E-03	2.15E-03	2.24E-03	2.41E-03	2.56E-03	2.71E-03	2.50E-03	2.09E-03	1.83E-03	1.69E-03	1.44E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0035***	***0.0045***	***0.0043***	***0.0040***	***0.0039***	***0.0033***	***0.0031***	***0.0033***	***0.0034***	***0.0037***	***0.0039***	***0.0041***	***0.0039***	***0.0032***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.65E-04	6.45E-04	4.55E-04	3.57E-04	3.02E-04	5.55E-04	1.23E-03	2.31E-03	2.97E-03	2.86E-03	2.70E-03	2.60E-03	2.18E-03	2.08E-03	2.19E-03	2.27E-03	2.45E-03	2.60E-03	2.76E-03	2.61E-03	2.13E-03	1.79E-03	1.65E-03	1.43E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.32E-04	3.22E-04	2.27E-04	1.78E-04	1.51E-04	2.78E-04	6.14E-04	1.16E-03	1.48E-03	1.43E-03	1.35E-03	1.30E-03	1.09E-03	1.04E-03	1.10E-03	1.14E-03	1.23E-03	1.30E-03	1.38E-03	1.30E-03	1.07E-03	8.95E-04	8.24E-04	7.16E-04
	Emission in each Box of 1st jet	g/s	2.88E-04	2.15E-04	1.52E-04	1.19E-04	1.01E-04	1.85E-04	4.09E-04	7.71E-04	9.90E-04	9.53E-04	8.99E-04	8.68E-04	7.28E-04	6.92E-04	7.31E-04	7.58E-04	8.18E-04	8.65E-04	9.21E-04	8.69E-04	7.11E-04	5.97E-04	5.50E-04	4.77E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	1.07E-04	7.58E-05	5.94E-05	5.03E-05	9.25E-05	2.05E-04	3.85E-04	4.95E-04	4.76E-04	4.50E-04	4.34E-04	3.64E-04	3.46E-04	3.65E-04	3.79E-04	4.09E-04	4.33E-04	4.61E-04	4.34E-04	3.56E-04	2.98E-04	2.75E-04	2.39E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1173	0.0860	0.0877	0.0963	0.1066	0.2550	0.2736	0.1763	0.1309	0.1289	0.1343	0.1349	0.1090	0.1133	0.1107	0.1107	0.1096	0.1089	0.1087	0.1037	0.1100	0.1170	0.1160	0.1118
	NO2	g/vehicle/km	0.0178	0.0164	0.0167	0.0174	0.0182	0.0264	0.0272	0.0209	0.0187	0.0185	0.0191	0.0190	0.0185	0.0190	0.0187	0.0187	0.0186	0.0184	0.0185	0.0180	0.0187	0.0191	0.0188	0.0185
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0085***	***0.0050***	***0.0035***	***0.0029***	***0.0027***	***0.0082***	***0.0188***	***0.0289***	***0.0316***	***0.0301***	***0.0288***	***0.0277***	***0.0196***	***0.0191***	***0.0198***	***0.0207***	***0.0215***	***0.0230***	***0.0243***	***0.0222***	***0.0194***	***0.0169***	***0.0156***	***0.0133***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.66E-03	3.35E-03	2.36E-03	1.94E-03	1.80E-03	5.45E-03	1.25E-02	1.92E-02	2.11E-02	2.01E-02	1.92E-02	1.85E-02	1.31E-02	1.27E-02	1.32E-02	1.38E-02	1.43E-02	1.53E-02	1.62E-02	1.48E-02	1.29E-02	1.12E-02	1.04E-02	8.86E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.83E-03	1.68E-03	1.18E-03	9.71E-04	8.98E-04	2.72E-03	6.25E-03	9.62E-03	1.05E-02	1.00E-02	9.59E-03	9.24E-03	6.53E-03	6.35E-03	6.59E-03	6.91E-03	7.17E-03	7.67E-03	8.09E-03	7.41E-03	6.45E-03	5.62E-03	5.21E-03	4.43E-03
	Emission in each Box of 1st jet	g/s	1.89E-03	1.12E-03	7.88E-04	6.48E-04	5.99E-04	1.82E-03	4.17E-03	6.41E-03	7.02E-03	6.70E-03	6.40E-03	6.16E-03	4.35E-03	4.23E-03	4.39E-03	4.61E-03	4.78E-03	5.11E-03	5.40E-03	4.94E-03	4.30E-03	3.75E-03	3.47E-03	2.95E-03
	Emission in each Box of 2nd jet	g/s	9.43E-04	5.58E-04	3.94E-04	3.24E-04	2.99E-04	9.08E-04	2.08E-03	3.21E-03	3.51E-03	3.35E-03	3.20E-03	3.08E-03	2.18E-03	2.12E-03	2.20E-03	2.30E-03	2.39E-03	2.56E-03	2.70E-03	2.47E-03	2.15E-03	1.87E-03	1.74E-03	1.48E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0019***	***0.0034***	***0.0045***	***0.0043***	***0.0041***	***0.0039***	***0.0033***	***0.0032***	***0.0033***	***0.0035***	***0.0036***	***0.0039***	***0.0041***	***0.0039***	***0.0033***	***0.0028***	***0.0025***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.59E-04	6.40E-04	4.51E-04	3.52E-04	3.06E-04	5.64E-04	1.24E-03	2.29E-03	3.00E-03	2.88E-03	2.73E-03	2.60E-03	2.21E-03	2.13E-03	2.23E-03	2.33E-03	2.43E-03	2.58E-03	2.75E-03	2.57E-03	2.20E-03	1.83E-03	1.68E-03	1.46E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.29E-04	3.20E-04	2.26E-04	1.76E-04	1.53E-04	2.82E-04	6.21E-04	1.14E-03	1.50E-03	1.44E-03	1.36E-03	1.30E-03	1.11E-03	1.06E-03	1.11E-03	1.17E-03	1.21E-03	1.29E-03	1.37E-03	1.28E-03	1.10E-03	9.17E-04	8.42E-04	7.32E-04
	Emission in each Box of 1st jet	g/s	2.86E-04	2.13E-04	1.50E-04	1.17E-04	1.02E-04	1.88E-04	4.14E-04	7.62E-04	1.00E-03	9.61E-04	9.09E-04	8.66E-04	7.38E-04	7.08E-04	7.43E-04	7.78E-04	8.09E-04	8.62E-04	9.16E-04	8.56E-04	7.33E-04	6.11E-04	5.62E-04	4.88E-04
	Emission in each Box of 2nd jet	g/s	1.43E-04	1.07E-04	7.52E-05	5.86E-05	5.11E-05	9.40E-05	2.07E-04	3.81E-04	5.00E-04	4.81E-04	4.55E-04	4.33E-04	3.69E-04	3.54E-04	3.71E-04	3.89E-04	4.04E-04	4.31E-04	4.58E-04	4.28E-04	3.66E-04	3.06E-04	2.81E-04	2.44E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1326	0.0982	0.0999	0.1106	0.1179	0.2820	0.3036	0.2025	0.1489	0.1465	0.1466	0.1508	0.1225	0.1247	0.1228	0.1221	0.1226	0.1214	0.1221	0.1182	0.1217	0.1302	0.1292	0.1239
	NO2	g/vehicle/km	0.0200	0.0185	0.0188	0.0197	0.0199	0.0290	0.0300	0.0239	0.0210	0.0208	0.0207	0.0210	0.0206	0.0207	0.0206	0.0205	0.0205	0.0203	0.0205	0.0203	0.0205	0.0210	0.0208	0.0204
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0096***	***0.0057***	***0.0040***	***0.0033***	***0.0030***	***0.0090***	***0.0208***	***0.0331***	***0.0359***	***0.0343***	***0.0314***	***0.0310***	***0.0220***	***0.0210***	***0.0219***	***0.0229***	***0.0240***	***0.0257***	***0.0273***	***0.0254***	***0.0214***	***0.0188***	***0.0174***	***0.0147***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.40E-03	3.83E-03	2.69E-03	2.23E-03	1.99E-03	6.03E-03	1.39E-02	2.21E-02	2.39E-02	2.28E-02	2.09E-02	2.07E-02	1.47E-02	1.40E-02	1.46E-02	1.53E-02	1.60E-02	1.71E-02	1.82E-02	1.69E-02	1.43E-02	1.25E-02	1.16E-02	9.82E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.20E-03	1.91E-03	1.35E-03	1.12E-03	9.94E-04	3.01E-03	6.94E-03	1.10E-02	1.20E-02	1.14E-02	1.05E-02	1.03E-02	7.34E-03	6.99E-03	7.31E-03	7.63E-03	8.01E-03	8.55E-03	9.09E-03	8.45E-03	7.14E-03	6.26E-03	5.80E-03	4.91E-03
	Emission in each Box of 1st jet	g/s	2.13E-03	1.28E-03	8.98E-04	7.44E-04	6.63E-04	2.01E-03	4.63E-03	7.36E-03	7.98E-03	7.61E-03	6.98E-03	6.89E-03	4.89E-03	4.66E-03	4.87E-03	5.08E-03	5.34E-03	5.70E-03	6.06E-03	5.63E-03	4.76E-03	4.17E-03	3.87E-03	3.27E-03
	Emission in each Box of 2nd jet	g/s	1.07E-03	6.38E-04	4.49E-04	3.72E-04	3.31E-04	1.00E-03	2.31E-03	3.68E-03	3.99E-03	3.81E-03	3.49E-03	3.44E-03	2.45E-03	2.33E-03	2.44E-03	2.54E-03	2.67E-03	2.85E-03	3.03E-03	2.82E-03	2.38E-03	2.09E-03	1.93E-03	1.64E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0021***	***0.0039***	***0.0051***	***0.0049***	***0.0044***	***0.0043***	***0.0037***	***0.0035***	***0.0037***	***0.0038***	***0.0040***	***0.0043***	***0.0046***	***0.0044***	***0.0036***	***0.0030***	***0.0028***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.64E-04	7.23E-04	5.08E-04	3.98E-04	3.36E-04	6.20E-04	1.37E-03	2.61E-03	3.38E-03	3.24E-03	2.96E-03	2.88E-03	2.46E-03	2.32E-03	2.45E-03	2.55E-03	2.69E-03	2.86E-03	3.06E-03	2.90E-03	2.41E-03	2.02E-03	1.87E-03	1.61E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.82E-04	3.61E-04	2.54E-04	1.99E-04	1.68E-04	3.10E-04	6.85E-04	1.30E-03	1.69E-03	1.62E-03	1.48E-03	1.44E-03	1.23E-03	1.16E-03	1.22E-03	1.28E-03	1.34E-03	1.43E-03	1.53E-03	1.45E-03	1.20E-03	1.01E-03	9.33E-04	8.06E-04
	Emission in each Box of 1st jet	g/s	3.21E-04	2.41E-04	1.69E-04	1.33E-04	1.12E-04	2.07E-04	4.57E-04	8.70E-04	1.13E-03	1.08E-03	9.86E-04	9.60E-04	8.22E-04	7.74E-04	8.17E-04	8.52E-04	8.95E-04	9.52E-04	1.02E-03	9.68E-04	8.03E-04	6.74E-04	6.22E-04	5.38E-04
	Emission in each Box of 2nd jet	g/s	1.61E-04	1.20E-04	8.46E-05	6.64E-05	5.59E-05	1.03E-04	2.28E-04	4.35E-04	5.63E-04	5.41E-04	4.93E-04	4.80E-04	4.11E-04	3.87E-04	4.08E-04	4.26E-04	4.48E-04	4.76E-04	5.10E-04	4.84E-04	4.01E-04	3.37E-04	3.11E-04	2.69E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1457	0.1096	0.1119	0.1252	0.1338	0.3182	0.3419	0.2276	0.1682	0.1660	0.1660	0.1697	0.1361	0.1385	0.1364	0.1357	0.1355	0.1367	0.1347	0.1325	0.1356	0.1449	0.1440	0.1387
	NO2	g/vehicle/km	0.0218	0.0204	0.0208	0.0220	0.0223	0.0325	0.0335	0.0267	0.0235	0.0234	0.0233	0.0235	0.0227	0.0228	0.0227	0.0226	0.0226	0.0226	0.0225	0.0226	0.0227	0.0232	0.0230	0.0226
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0105***	***0.0064***	***0.0045***	***0.0038***	***0.0034***	***0.0102***	***0.0234***	***0.0373***	***0.0406***	***0.0388***	***0.0356***	***0.0349***	***0.0245***	***0.0233***	***0.0244***	***0.0254***	***0.0266***	***0.0289***	***0.0301***	***0.0284***	***0.0239***	***0.0209***	***0.0194***	***0.0165***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.03E-03	4.27E-03	3.01E-03	2.53E-03	2.26E-03	6.80E-03	1.56E-02	2.48E-02	2.71E-02	2.59E-02	2.37E-02	2.32E-02	1.63E-02	1.55E-02	1.62E-02	1.70E-02	1.77E-02	1.93E-02	2.01E-02	1.89E-02	1.59E-02	1.39E-02	1.29E-02	1.10E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.51E-03	2.14E-03	1.51E-03	1.26E-03	1.13E-03	3.40E-03	7.81E-03	1.24E-02	1.35E-02	1.29E-02	1.19E-02	1.16E-02	8.15E-03	7.77E-03	8.12E-03	8.48E-03	8.86E-03	9.63E-03	1.00E-02	9.47E-03	7.95E-03	6.97E-03	6.47E-03	5.49E-03
	Emission in each Box of 1st jet	g/s	2.34E-03	1.42E-03	1.00E-03	8.42E-04	7.52E-04	2.27E-03	5.21E-03	8.28E-03	9.02E-03	8.62E-03	7.91E-03	7.75E-03	5.43E-03	5.18E-03	5.41E-03	5.65E-03	5.91E-03	6.42E-03	6.68E-03	6.32E-03	5.30E-03	4.65E-03	4.31E-03	3.66E-03
	Emission in each Box of 2nd jet	g/s	1.17E-03	7.12E-04	5.02E-04	4.21E-04	3.76E-04	1.13E-03	2.60E-03	4.14E-03	4.51E-03	4.31E-03	3.95E-03	3.87E-03	2.72E-03	2.59E-03	2.71E-03	2.83E-03	2.95E-03	3.21E-03	3.34E-03	3.16E-03	2.65E-03	2.32E-03	2.16E-03	1.83E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0012***	***0.0008***	***0.0007***	***0.0006***	***0.0010***	***0.0023***	***0.0044***	***0.0057***	***0.0055***	***0.0050***	***0.0048***	***0.0041***	***0.0038***	***0.0041***	***0.0042***	***0.0044***	***0.0048***	***0.0050***	***0.0048***	***0.0040***	***0.0033***	***0.0031***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.05E-03	7.96E-04	5.60E-04	4.44E-04	3.75E-04	6.95E-04	1.53E-03	2.91E-03	3.78E-03	3.65E-03	3.33E-03	3.22E-03	2.72E-03	2.56E-03	2.70E-03	2.82E-03	2.95E-03	3.19E-03	3.35E-03	3.22E-03	2.66E-03	2.23E-03	2.06E-03	1.79E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.26E-04	3.98E-04	2.80E-04	2.22E-04	1.88E-04	3.47E-04	7.66E-04	1.46E-03	1.89E-03	1.82E-03	1.66E-03	1.61E-03	1.36E-03	1.28E-03	1.35E-03	1.41E-03	1.48E-03	1.59E-03	1.67E-03	1.61E-03	1.33E-03	1.12E-03	1.03E-03	8.96E-04
	Emission in each Box of 1st jet	g/s	3.50E-04	2.65E-04	1.87E-04	1.48E-04	1.25E-04	2.32E-04	5.11E-04	9.71E-04	1.26E-03	1.22E-03	1.11E-03	1.07E-03	9.07E-04	8.54E-04	9.01E-04	9.41E-04	9.84E-04	1.06E-03	1.12E-03	1.07E-03	8.87E-04	7.44E-04	6.88E-04	5.97E-04
	Emission in each Box of 2nd jet	g/s	1.75E-04	1.33E-04	9.33E-05	7.39E-05	6.26E-05	1.16E-04	2.55E-04	4.85E-04	6.30E-04	6.08E-04	5.54E-04	5.37E-04	4.53E-04	4.27E-04	4.51E-04	4.70E-04	4.92E-04	5.31E-04	5.58E-04	5.37E-04	4.43E-04	3.72E-04	3.44E-04	2.99E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(With Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4220	4045	3539	3312	3516	3690	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1539	0.1152	0.1176	0.1308	0.1415	0.3334	0.3570	0.2376	0.1757	0.1731	0.1727	0.1768	0.1414	0.1440	0.1422	0.1412	0.1410	0.1419	0.1413	0.1372	0.1409	0.1502	0.1512	0.1456
	NO2	g/vehicle/km	0.0228	0.0212	0.0216	0.0227	0.0233	0.0339	0.0348	0.0277	0.0245	0.0242	0.0241	0.0244	0.0235	0.0236	0.0236	0.0234	0.0234	0.0234	0.0234	0.0232	0.0234	0.0239	0.0239	0.0235
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0122	0.0124	0.0101	0.0103	0.0101	0.0101	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0112	0.0115	0.0093	0.0095	0.0093	0.0093	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0111***	***0.0067***	***0.0048***	***0.0040***	***0.0036***	***0.0107***	***0.0245***	***0.0389***	***0.0424***	***0.0405***	***0.0370***	***0.0363***	***0.0254***	***0.0242***	***0.0254***	***0.0265***	***0.0277***	***0.0300***	***0.0316***	***0.0294***	***0.0248***	***0.0217***	***0.0204***	***0.0173***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.43E-03	4.49E-03	3.17E-03	2.64E-03	2.39E-03	7.12E-03	1.63E-02	2.59E-02	2.83E-02	2.70E-02	2.47E-02	2.42E-02	1.69E-02	1.61E-02	1.69E-02	1.76E-02	1.84E-02	2.00E-02	2.10E-02	1.96E-02	1.65E-02	1.44E-02	1.36E-02	1.15E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.71E-03	2.25E-03	1.59E-03	1.32E-03	1.19E-03	3.56E-03	8.16E-03	1.30E-02	1.41E-02	1.35E-02	1.23E-02	1.21E-02	8.47E-03	8.07E-03	8.46E-03	8.82E-03	9.22E-03	9.99E-03	1.05E-02	9.81E-03	8.26E-03	7.22E-03	6.79E-03	5.77E-03
	Emission in each Box of 1st jet	g/s	2.48E-03	1.50E-03	1.06E-03	8.80E-04	7.95E-04	2.37E-03	5.44E-03	8.64E-03	9.42E-03	9.00E-03	8.22E-03	8.07E-03	5.65E-03	5.38E-03	5.64E-03	5.88E-03	6.15E-03	6.66E-03	7.01E-03	6.54E-03	5.51E-03	4.81E-03	4.53E-03	3.85E-03
	Emission in each Box of 2nd jet	g/s	1.24E-03	7.48E-04	5.28E-04	4.40E-04	3.98E-04	1.19E-03	2.72E-03	4.32E-03	4.71E-03	4.50E-03	4.11E-03	4.04E-03	2.82E-03	2.69E-03	2.82E-03	2.94E-03	3.07E-03	3.33E-03	3.51E-03	3.27E-03	2.75E-03	2.41E-03	2.26E-03	1.92E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0024***	***0.0045***	***0.0059***	***0.0057***	***0.0052***	***0.0050***	***0.0042***	***0.0040***	***0.0042***	***0.0044***	***0.0046***	***0.0049***	***0.0052***	***0.0050***	***0.0041***	***0.0034***	***0.0032***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.10E-03	8.28E-04	5.83E-04	4.59E-04	3.92E-04	7.23E-04	1.59E-03	3.02E-03	3.93E-03	3.78E-03	3.44E-03	3.34E-03	2.82E-03	2.65E-03	2.81E-03	2.92E-03	3.06E-03	3.29E-03	3.49E-03	3.32E-03	2.75E-03	2.30E-03	2.15E-03	1.87E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.51E-04	4.14E-04	2.91E-04	2.29E-04	1.96E-04	3.62E-04	7.96E-04	1.51E-03	1.97E-03	1.89E-03	1.72E-03	1.67E-03	1.41E-03	1.33E-03	1.40E-03	1.46E-03	1.53E-03	1.65E-03	1.74E-03	1.66E-03	1.37E-03	1.15E-03	1.07E-03	9.33E-04
	Emission in each Box of 1st jet	g/s	3.67E-04	2.76E-04	1.94E-04	1.53E-04	1.31E-04	2.41E-04	5.31E-04	1.01E-03	1.31E-03	1.26E-03	1.15E-03	1.11E-03	9.38E-04	8.84E-04	9.36E-04	9.74E-04	1.02E-03	1.10E-03	1.16E-03	1.11E-03	9.16E-04	7.66E-04	7.16E-04	6.22E-04
	Emission in each Box of 2nd jet	g/s	1.84E-04	1.38E-04	9.71E-05	7.64E-05	6.53E-05	1.21E-04	2.65E-04	5.04E-04	6.56E-04	6.30E-04	5.73E-04	5.56E-04	4.69E-04	4.42E-04	4.68E-04	4.87E-04	5.09E-04	5.49E-04	5.81E-04	5.53E-04	4.58E-04	3.83E-04	3.58E-04	3.11E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.62E-03***	***2.56E-03***	***1.82E-03***	***1.73E-03***	***1.81E-03***	***1.90E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.74E-03	1.70E-03	1.21E-03	1.15E-03	1.21E-03	1.27E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.72E-04	8.52E-04	6.06E-04	5.77E-04	6.03E-04	6.33E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.81E-04	5.68E-04	4.04E-04	3.85E-04	4.02E-04	4.22E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.91E-04	2.84E-04	2.02E-04	1.92E-04	2.01E-04	2.11E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.41E-03***	***2.35E-03***	***1.67E-03***	***1.59E-03***	***1.67E-03***	***1.75E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.60E-03	1.57E-03	1.12E-03	1.06E-03	1.11E-03	1.17E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.02E-04	7.85E-04	5.58E-04	5.32E-04	5.56E-04	5.83E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.35E-04	5.23E-04	3.72E-04	3.54E-04	3.71E-04	3.89E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.67E-04	2.62E-04	1.86E-04	1.77E-04	1.85E-04	1.94E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2677	0.2254	0.2279	0.2394	0.2471	0.4642	0.4907	0.4240	0.4575	0.4225	0.4158	0.4101	0.3907	0.3711	0.3894	0.4041	0.4000	0.4278	0.4544	0.4155	0.3831	0.3530	0.3417	0.3239
	NO2	g/vehicle/km	0.0473	0.0455	0.0450	0.0463	0.0473	0.0589	0.0599	0.0638	0.0819	0.0753	0.0739	0.0720	0.0759	0.0717	0.0757	0.0787	0.0774	0.0835	0.0900	0.0826	0.0741	0.0662	0.0634	0.0610
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0147***	***0.0101***	***0.0070***	***0.0055***	***0.0047***	***0.0109***	***0.0247***	***0.0522***	***0.0837***	***0.0749***	***0.0678***	***0.0640***	***0.0577***	***0.0512***	***0.0571***	***0.0622***	***0.0642***	***0.0740***	***0.0830***	***0.0729***	***0.0552***	***0.0416***	***0.0377***	***0.0315***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.83E-03	6.71E-03	4.66E-03	3.64E-03	3.16E-03	7.30E-03	1.65E-02	3.48E-02	5.58E-02	4.99E-02	4.52E-02	4.27E-02	3.85E-02	3.42E-02	3.80E-02	4.15E-02	4.28E-02	4.93E-02	5.54E-02	4.86E-02	3.68E-02	2.78E-02	2.51E-02	2.10E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.91E-03	3.35E-03	2.33E-03	1.82E-03	1.58E-03	3.65E-03	8.24E-03	1.74E-02	2.79E-02	2.50E-02	2.26E-02	2.13E-02	1.92E-02	1.71E-02	1.90E-02	2.07E-02	2.14E-02	2.47E-02	2.77E-02	2.43E-02	1.84E-02	1.39E-02	1.26E-02	1.05E-02
	Emission in each Box of 1st jet	g/s	1.40E-03	9.58E-04	6.66E-04	5.20E-04	4.51E-04	1.04E-03	2.35E-03	4.97E-03	7.97E-03	7.13E-03	6.46E-03	6.10E-03	5.50E-03	4.88E-03	5.43E-03	5.92E-03	6.12E-03	7.04E-03	7.91E-03	6.94E-03	5.25E-03	3.97E-03	3.59E-03	3.00E-03
	Emission in each Box of 2nd jet	g/s	2.46E-03	1.68E-03	1.17E-03	9.11E-04	7.89E-04	1.82E-03	4.12E-03	8.70E-03	1.39E-02	1.25E-02	1.13E-02	1.07E-02	9.62E-03	8.54E-03	9.51E-03	1.04E-02	1.07E-02	1.23E-02	1.38E-02	1.22E-02	9.20E-03	6.94E-03	6.28E-03	5.25E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0011***	***0.0009***	***0.0014***	***0.0030***	***0.0079***	***0.0150***	***0.0134***	***0.0121***	***0.0112***	***0.0112***	***0.0099***	***0.0111***	***0.0121***	***0.0124***	***0.0144***	***0.0165***	***0.0145***	***0.0107***	***0.0078***	***0.0070***	***0.0059***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.74E-03	1.35E-03	9.21E-04	7.05E-04	6.04E-04	9.26E-04	2.01E-03	5.24E-03	9.99E-03	8.91E-03	8.04E-03	7.50E-03	7.48E-03	6.60E-03	7.40E-03	8.08E-03	8.29E-03	9.63E-03	1.10E-02	9.67E-03	7.11E-03	5.20E-03	4.66E-03	3.95E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.68E-04	6.77E-04	4.61E-04	3.52E-04	3.02E-04	4.63E-04	1.01E-03	2.62E-03	5.00E-03	4.45E-03	4.02E-03	3.75E-03	3.74E-03	3.30E-03	3.70E-03	4.04E-03	4.14E-03	4.81E-03	5.48E-03	4.83E-03	3.56E-03	2.60E-03	2.33E-03	1.98E-03
	Emission in each Box of 1st jet	g/s	2.48E-04	1.93E-04	1.32E-04	1.01E-04	8.63E-05	1.32E-04	2.87E-04	7.48E-04	1.43E-03	1.27E-03	1.15E-03	1.07E-03	1.07E-03	9.42E-04	1.06E-03	1.15E-03	1.18E-03	1.38E-03	1.57E-03	1.38E-03	1.02E-03	7.43E-04	6.66E-04	5.65E-04
	Emission in each Box of 2nd jet	g/s	4.34E-04	3.39E-04	2.30E-04	1.76E-04	1.51E-04	2.32E-04	5.03E-04	1.31E-03	2.50E-03	2.23E-03	2.01E-03	1.87E-03	1.87E-03	1.65E-03	1.85E-03	2.02E-03	2.07E-03	2.41E-03	2.74E-03	2.42E-03	1.78E-03	1.30E-03	1.17E-03	9.88E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 085A01-085A09
Enclosure Involvec: 085P1
Road Located: 085
Vehicle EF Adopte: 085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2446	0.2050	0.2064	0.2178	0.2313	0.4405	0.4677	0.4007	0.4333	0.4049	0.3999	0.3925	0.3728	0.3498	0.3695	0.3847	0.3805	0.4021	0.4173	0.3810	0.3495	0.3227	0.3125	0.2959
	NO2	g/vehicle/km	0.0438	0.0420	0.0414	0.0429	0.0449	0.0564	0.0574	0.0609	0.0783	0.0727	0.0716	0.0694	0.0730	0.0682	0.0725	0.0756	0.0742	0.0792	0.0835	0.0765	0.0683	0.0611	0.0587	0.0563
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0135***	***0.0092***	***0.0063***	***0.0050***	***0.0044***	***0.0104***	***0.0236***	***0.0493***	***0.0793***	***0.0718***	***0.0652***	***0.0613***	***0.0551***	***0.0483***	***0.0542***	***0.0592***	***0.0611***	***0.0695***	***0.0763***	***0.0669***	***0.0503***	***0.0381***	***0.0345***	***0.0288***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.98E-03	6.10E-03	4.23E-03	3.32E-03	2.96E-03	6.93E-03	1.57E-02	3.29E-02	5.28E-02	4.79E-02	4.35E-02	4.09E-02	3.67E-02	3.22E-02	3.61E-02	3.95E-02	4.07E-02	4.64E-02	5.08E-02	4.46E-02	3.36E-02	2.54E-02	2.30E-02	1.92E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.49E-03	3.05E-03	2.11E-03	1.66E-03	1.48E-03	3.46E-03	7.85E-03	1.64E-02	2.64E-02	2.39E-02	2.17E-02	2.04E-02	1.84E-02	1.61E-02	1.81E-02	1.97E-02	2.04E-02	2.32E-02	2.54E-02	2.23E-02	1.68E-02	1.27E-02	1.15E-02	9.60E-03
	Emission in each Box of 1st jet	g/s	1.28E-03	8.72E-04	6.04E-04	4.74E-04	4.22E-04	9.89E-04	2.24E-03	4.70E-03	7.55E-03	6.84E-03	6.21E-03	5.84E-03	5.25E-03	4.60E-03	5.16E-03	5.64E-03	5.82E-03	6.62E-03	7.26E-03	6.37E-03	4.79E-03	3.63E-03	3.28E-03	2.74E-03
	Emission in each Box of 2nd jet	g/s	2.24E-03	1.53E-03	1.06E-03	8.29E-04	7.39E-04	1.73E-03	3.93E-03	8.22E-03	1.32E-02	1.20E-02	1.09E-02	1.02E-02	9.18E-03	8.05E-03	9.03E-03	9.87E-03	1.02E-02	1.16E-02	1.27E-02	1.11E-02	8.39E-03	6.35E-03	5.75E-03	4.80E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0009***	***0.0013***	***0.0029***	***0.0075***	***0.0143***	***0.0129***	***0.0117***	***0.0108***	***0.0108***	***0.0094***	***0.0106***	***0.0116***	***0.0119***	***0.0137***	***0.0153***	***0.0134***	***0.0098***	***0.0072***	***0.0065***	***0.0055***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.61E-03	1.25E-03	8.48E-04	6.53E-04	5.74E-04	8.86E-04	1.93E-03	4.99E-03	9.55E-03	8.60E-03	7.79E-03	7.23E-03	7.20E-03	6.27E-03	7.08E-03	7.75E-03	7.94E-03	9.12E-03	1.02E-02	8.95E-03	6.56E-03	4.81E-03	4.31E-03	3.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.03E-04	6.25E-04	4.24E-04	3.26E-04	2.87E-04	4.43E-04	9.65E-04	2.50E-03	4.77E-03	4.30E-03	3.89E-03	3.61E-03	3.60E-03	3.14E-03	3.54E-03	3.88E-03	3.97E-03	4.56E-03	5.09E-03	4.48E-03	3.28E-03	2.40E-03	2.16E-03	1.83E-03
	Emission in each Box of 1st jet	g/s	2.30E-04	1.79E-04	1.21E-04	9.32E-05	8.21E-05	1.27E-04	2.76E-04	7.13E-04	1.36E-03	1.23E-03	1.11E-03	1.03E-03	1.03E-03	8.96E-04	1.01E-03	1.11E-03	1.13E-03	1.30E-03	1.45E-03	1.28E-03	9.37E-04	6.87E-04	6.16E-04	5.22E-04
	Emission in each Box of 2nd jet	g/s	4.02E-04	3.13E-04	2.12E-04	1.63E-04	1.44E-04	2.22E-04	4.82E-04	1.25E-03	2.39E-03	2.15E-03	1.95E-03	1.81E-03	1.80E-03	1.57E-03	1.77E-03	1.94E-03	1.98E-03	2.28E-03	2.54E-03	2.24E-03	1.64E-03	1.20E-03	1.08E-03	9.13E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section 085A01-085A09

Enclosure Involvec 085P1

Road Located 085

Vehicle EF Adopte 085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2469	0.2048	0.2065	0.2183	0.2271	0.4299	0.4531	0.3946	0.4255	0.3933	0.3797	0.3736	0.3545	0.3369	0.3533	0.3681	0.3657	0.3903	0.4153	0.3815	0.3540	0.3236	0.3185	0.3026
	NO2	g/vehicle/km	0.0442	0.0421	0.0416	0.0430	0.0442	0.0551	0.0558	0.0600	0.0770	0.0708	0.0683	0.0664	0.0698	0.0659	0.0696	0.0726	0.0716	0.0771	0.0832	0.0767	0.0692	0.0614	0.0598	0.0576
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0136***	***0.0091***	***0.0063***	***0.0050***	***0.0044***	***0.0101***	***0.0228***	***0.0486***	***0.0778***	***0.0697***	***0.0619***	***0.0583***	***0.0524***	***0.0465***	***0.0518***	***0.0567***	***0.0587***	***0.0675***	***0.0759***	***0.0669***	***0.0510***	***0.0382***	***0.0351***	***0.0294***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.06E-03	6.09E-03	4.23E-03	3.32E-03	2.90E-03	6.76E-03	1.52E-02	3.24E-02	5.19E-02	4.65E-02	4.13E-02	3.89E-02	3.49E-02	3.10E-02	3.45E-02	3.78E-02	3.91E-02	4.50E-02	5.06E-02	4.46E-02	3.40E-02	2.55E-02	2.34E-02	1.96E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.53E-03	3.05E-03	2.11E-03	1.66E-03	1.45E-03	3.38E-03	7.61E-03	1.62E-02	2.59E-02	2.32E-02	2.06E-02	1.94E-02	1.75E-02	1.55E-02	1.73E-02	1.89E-02	1.96E-02	2.25E-02	2.53E-02	2.23E-02	1.70E-02	1.27E-02	1.17E-02	9.82E-03
	Emission in each Box of 1st jet	g/s	1.29E-03	8.71E-04	6.04E-04	4.75E-04	4.15E-04	9.66E-04	2.17E-03	4.63E-03	7.41E-03	6.64E-03	5.90E-03	5.56E-03	4.99E-03	4.43E-03	4.93E-03	5.40E-03	5.59E-03	6.43E-03	7.23E-03	6.38E-03	4.86E-03	3.64E-03	3.35E-03	2.80E-03
	Emission in each Box of 2nd jet	g/s	2.27E-03	1.52E-03	1.06E-03	8.30E-04	7.25E-04	1.69E-03	3.81E-03	8.10E-03	1.30E-02	1.16E-02	1.03E-02	9.72E-03	8.73E-03	7.75E-03	8.63E-03	9.44E-03	9.78E-03	1.12E-02	1.26E-02	1.12E-02	8.50E-03	6.36E-03	5.85E-03	4.91E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0013***	***0.0028***	***0.0074***	***0.0141***	***0.0126***	***0.0111***	***0.0104***	***0.0103***	***0.0091***	***0.0102***	***0.0112***	***0.0115***	***0.0133***	***0.0152***	***0.0135***	***0.0100***	***0.0072***	***0.0066***	***0.0056***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.62E-03	1.25E-03	8.51E-04	6.55E-04	5.65E-04	8.66E-04	1.87E-03	4.92E-03	9.39E-03	8.37E-03	7.43E-03	6.91E-03	6.88E-03	6.07E-03	6.80E-03	7.45E-03	7.66E-03	8.89E-03	1.01E-02	8.97E-03	6.64E-03	4.83E-03	4.39E-03	3.74E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.11E-04	6.27E-04	4.25E-04	3.27E-04	2.82E-04	4.33E-04	9.37E-04	2.46E-03	4.69E-03	4.19E-03	3.71E-03	3.46E-03	3.44E-03	3.03E-03	3.40E-03	3.72E-03	3.83E-03	4.44E-03	5.07E-03	4.49E-03	3.32E-03	2.41E-03	2.20E-03	1.87E-03
	Emission in each Box of 1st jet	g/s	2.32E-04	1.79E-04	1.22E-04	9.35E-05	8.07E-05	1.24E-04	2.68E-04	7.03E-04	1.34E-03	1.20E-03	1.06E-03	9.88E-04	9.82E-04	8.67E-04	9.71E-04	1.06E-03	1.09E-03	1.27E-03	1.45E-03	1.28E-03	9.49E-04	6.90E-04	6.28E-04	5.34E-04
	Emission in each Box of 2nd jet	g/s	4.06E-04	3.13E-04	2.13E-04	1.64E-04	1.41E-04	2.17E-04	4.68E-04	1.23E-03	2.35E-03	2.09E-03	1.86E-03	1.73E-03	1.72E-03	1.52E-03	1.70E-03	1.86E-03	1.92E-03	2.22E-03	2.53E-03	2.24E-03	1.66E-03	1.21E-03	1.10E-03	9.34E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2272	0.1907	0.1942	0.2051	0.2136	0.4091	0.4380	0.3944	0.4234	0.3931	0.3851	0.3747	0.3501	0.3337	0.3461	0.3608	0.3598	0.3789	0.3977	0.3606	0.3316	0.3024	0.2916	0.2715
	NO2	g/vehicle/km	0.0411	0.0396	0.0394	0.0408	0.0420	0.0526	0.0541	0.0601	0.0767	0.0710	0.0694	0.0667	0.0691	0.0655	0.0684	0.0713	0.0706	0.0751	0.0800	0.0729	0.0652	0.0577	0.0551	0.0521
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0125***	***0.0085***	***0.0060***	***0.0047***	***0.0041***	***0.0096***	***0.0221***	***0.0485***	***0.0774***	***0.0697***	***0.0628***	***0.0585***	***0.0517***	***0.0461***	***0.0507***	***0.0555***	***0.0578***	***0.0655***	***0.0727***	***0.0633***	***0.0478***	***0.0357***	***0.0322***	***0.0264***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.34E-03	5.67E-03	3.98E-03	3.12E-03	2.73E-03	6.43E-03	1.47E-02	3.24E-02	5.16E-02	4.65E-02	4.19E-02	3.90E-02	3.45E-02	3.07E-02	3.38E-02	3.70E-02	3.85E-02	4.37E-02	4.84E-02	4.22E-02	3.18E-02	2.38E-02	2.14E-02	1.76E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.17E-03	2.84E-03	1.99E-03	1.56E-03	1.37E-03	3.22E-03	7.36E-03	1.62E-02	2.58E-02	2.32E-02	2.09E-02	1.95E-02	1.72E-02	1.54E-02	1.69E-02	1.85E-02	1.93E-02	2.18E-02	2.42E-02	2.11E-02	1.59E-02	1.19E-02	1.07E-02	8.81E-03
	Emission in each Box of 1st jet	g/s	1.19E-03	8.11E-04	5.68E-04	4.46E-04	3.90E-04	9.19E-04	2.10E-03	4.62E-03	7.38E-03	6.64E-03	5.98E-03	5.57E-03	4.93E-03	4.39E-03	4.83E-03	5.29E-03	5.50E-03	6.24E-03	6.92E-03	6.03E-03	4.55E-03	3.40E-03	3.06E-03	2.52E-03
	Emission in each Box of 2nd jet	g/s	2.08E-03	1.42E-03	9.94E-04	7.80E-04	6.83E-04	1.61E-03	3.68E-03	8.09E-03	1.29E-02	1.16E-02	1.05E-02	9.75E-03	8.62E-03	7.68E-03	8.45E-03	9.26E-03	9.63E-03	1.09E-02	1.21E-02	1.05E-02	7.96E-03	5.95E-03	5.36E-03	4.40E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0027***	***0.0074***	***0.0140***	***0.0126***	***0.0113***	***0.0104***	***0.0102***	***0.0090***	***0.0100***	***0.0110***	***0.0113***	***0.0130***	***0.0146***	***0.0128***	***0.0094***	***0.0068***	***0.0061***	***0.0051***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.51E-03	1.18E-03	8.07E-04	6.21E-04	5.36E-04	8.28E-04	1.82E-03	4.93E-03	9.36E-03	8.39E-03	7.54E-03	6.94E-03	6.81E-03	6.02E-03	6.68E-03	7.32E-03	7.56E-03	8.66E-03	9.74E-03	8.53E-03	6.26E-03	4.54E-03	4.05E-03	3.38E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.54E-04	5.89E-04	4.04E-04	3.11E-04	2.68E-04	4.14E-04	9.08E-04	2.47E-03	4.68E-03	4.19E-03	3.77E-03	3.47E-03	3.40E-03	3.01E-03	3.34E-03	3.66E-03	3.78E-03	4.33E-03	4.87E-03	4.26E-03	3.13E-03	2.27E-03	2.03E-03	1.69E-03
	Emission in each Box of 1st jet	g/s	2.15E-04	1.68E-04	1.15E-04	8.88E-05	7.66E-05	1.18E-04	2.59E-04	7.05E-04	1.34E-03	1.20E-03	1.08E-03	9.92E-04	9.73E-04	8.61E-04	9.54E-04	1.05E-03	1.08E-03	1.24E-03	1.39E-03	1.22E-03	8.94E-04	6.48E-04	5.79E-04	4.83E-04
	Emission in each Box of 2nd jet	g/s	3.77E-04	2.95E-04	2.02E-04	1.55E-04	1.34E-04	2.07E-04	4.54E-04	1.23E-03	2.34E-03	2.10E-03	1.89E-03	1.74E-03	1.70E-03	1.51E-03	1.67E-03	1.83E-03	1.89E-03	2.16E-03	2.44E-03	2.13E-03	1.57E-03	1.13E-03	1.01E-03	8.45E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2188	0.1778	0.1783	0.1861	0.1932	0.3688	0.3891	0.3397	0.3746	0.3474	0.3444	0.3394	0.3223	0.3000	0.3194	0.3293	0.3236	0.3394	0.3575	0.3287	0.3050	0.2841	0.2763	0.2597
	NO2	g/vehicle/km	0.0396	0.0372	0.0365	0.0374	0.0384	0.0478	0.0484	0.0522	0.0684	0.0632	0.0624	0.0608	0.0639	0.0592	0.0634	0.0654	0.0638	0.0676	0.0723	0.0667	0.0602	0.0544	0.0524	0.0500
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0120***	***0.0079***	***0.0055***	***0.0042***	***0.0037***	***0.0087***	***0.0196***	***0.0418***	***0.0685***	***0.0616***	***0.0562***	***0.0530***	***0.0476***	***0.0414***	***0.0468***	***0.0507***	***0.0519***	***0.0587***	***0.0653***	***0.0577***	***0.0439***	***0.0335***	***0.0305***	***0.0253***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.03E-03	5.29E-03	3.65E-03	2.83E-03	2.47E-03	5.80E-03	1.31E-02	2.79E-02	4.57E-02	4.11E-02	3.75E-02	3.53E-02	3.18E-02	2.76E-02	3.12E-02	3.38E-02	3.46E-02	3.91E-02	4.36E-02	3.85E-02	2.93E-02	2.23E-02	2.03E-02	1.68E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.02E-03	2.65E-03	1.83E-03	1.42E-03	1.23E-03	2.90E-03	6.54E-03	1.39E-02	2.28E-02	2.05E-02	1.87E-02	1.77E-02	1.59E-02	1.38E-02	1.56E-02	1.69E-02	1.73E-02	1.96E-02	2.18E-02	1.92E-02	1.46E-02	1.12E-02	1.02E-02	8.42E-03
	Emission in each Box of 1st jet	g/s	1.15E-03	7.56E-04	5.22E-04	4.04E-04	3.53E-04	8.28E-04	1.87E-03	3.98E-03	6.53E-03	5.87E-03	5.35E-03	5.05E-03	4.54E-03	3.94E-03	4.46E-03	4.83E-03	4.95E-03	5.59E-03	6.22E-03	5.49E-03	4.18E-03	3.19E-03	2.90E-03	2.41E-03
	Emission in each Box of 2nd jet	g/s	2.01E-03	1.32E-03	9.13E-04	7.08E-04	6.17E-04	1.45E-03	3.27E-03	6.97E-03	1.14E-02	1.03E-02	9.36E-03	8.83E-03	7.94E-03	6.90E-03	7.80E-03	8.45E-03	8.66E-03	9.78E-03	1.09E-02	9.61E-03	7.32E-03	5.59E-03	5.08E-03	4.21E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0011***	***0.0009***	***0.0007***	***0.0011***	***0.0024***	***0.0064***	***0.0125***	***0.0112***	***0.0102***	***0.0095***	***0.0094***	***0.0082***	***0.0093***	***0.0101***	***0.0102***	***0.0117***	***0.0132***	***0.0117***	***0.0087***	***0.0064***	***0.0058***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.45E-03	1.11E-03	7.48E-04	5.70E-04	4.91E-04	7.52E-04	1.63E-03	4.29E-03	8.34E-03	7.47E-03	6.79E-03	6.32E-03	6.29E-03	5.44E-03	6.19E-03	6.71E-03	6.83E-03	7.79E-03	8.81E-03	7.80E-03	5.78E-03	4.28E-03	3.85E-03	3.24E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.27E-04	5.53E-04	3.74E-04	2.85E-04	2.45E-04	3.76E-04	8.13E-04	2.14E-03	4.17E-03	3.74E-03	3.40E-03	3.16E-03	3.15E-03	2.72E-03	3.10E-03	3.36E-03	3.41E-03	3.89E-03	4.40E-03	3.90E-03	2.89E-03	2.14E-03	1.93E-03	1.62E-03
	Emission in each Box of 1st jet	g/s	2.08E-04	1.58E-04	1.07E-04	8.14E-05	7.01E-05	1.07E-04	2.32E-04	6.12E-04	1.19E-03	1.07E-03	9.70E-04	9.04E-04	8.99E-04	7.78E-04	8.85E-04	9.59E-04	9.75E-04	1.11E-03	1.26E-03	1.11E-03	8.26E-04	6.11E-04	5.51E-04	4.63E-04
	Emission in each Box of 2nd jet	g/s	3.64E-04	2.76E-04	1.87E-04	1.42E-04	1.23E-04	1.88E-04	4.06E-04	1.07E-03	2.09E-03	1.87E-03	1.70E-03	1.58E-03	1.57E-03	1.36E-03	1.55E-03	1.68E-03	1.71E-03	1.95E-03	2.20E-03	1.95E-03	1.45E-03	1.07E-03	9.64E-04	8.11E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1995	0.1685	0.1737	0.1796	0.1858	0.3523	0.3716	0.3345	0.3732	0.3423	0.3383	0.3276	0.3110	0.3008	0.3162	0.3287	0.3213	0.3437	0.3708	0.3336	0.3088	0.2849	0.2738	0.2632
	NO2	g/vehicle/km	0.0363	0.0354	0.0357	0.0363	0.0371	0.0458	0.0463	0.0515	0.0682	0.0623	0.0614	0.0587	0.0617	0.0593	0.0627	0.0653	0.0634	0.0684	0.0748	0.0677	0.0609	0.0546	0.0520	0.0506
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0110***	***0.0075***	***0.0053***	***0.0041***	***0.0036***	***0.0083***	***0.0187***	***0.0412***	***0.0683***	***0.0607***	***0.0552***	***0.0511***	***0.0460***	***0.0415***	***0.0463***	***0.0506***	***0.0516***	***0.0594***	***0.0678***	***0.0585***	***0.0445***	***0.0336***	***0.0302***	***0.0256***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.32E-03	5.02E-03	3.56E-03	2.73E-03	2.38E-03	5.54E-03	1.25E-02	2.75E-02	4.55E-02	4.05E-02	3.68E-02	3.41E-02	3.06E-02	2.77E-02	3.09E-02	3.37E-02	3.44E-02	3.96E-02	4.52E-02	3.90E-02	2.97E-02	2.24E-02	2.01E-02	1.71E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.66E-03	2.51E-03	1.78E-03	1.37E-03	1.19E-03	2.77E-03	6.24E-03	1.37E-02	2.28E-02	2.02E-02	1.84E-02	1.70E-02	1.53E-02	1.38E-02	1.54E-02	1.69E-02	1.72E-02	1.98E-02	2.26E-02	1.95E-02	1.48E-02	1.12E-02	1.01E-02	8.54E-03
	Emission in each Box of 1st jet	g/s	1.05E-03	7.16E-04	5.08E-04	3.91E-04	3.39E-04	7.91E-04	1.78E-03	3.92E-03	6.50E-03	5.78E-03	5.26E-03	4.87E-03	4.38E-03	3.95E-03	4.41E-03	4.82E-03	4.91E-03	5.66E-03	6.45E-03	5.58E-03	4.24E-03	3.20E-03	2.88E-03	2.44E-03
	Emission in each Box of 2nd jet	g/s	1.83E-03	1.25E-03	8.89E-04	6.83E-04	5.94E-04	1.38E-03	3.12E-03	6.86E-03	1.14E-02	1.01E-02	9.20E-03	8.52E-03	7.66E-03	6.92E-03	7.72E-03	8.43E-03	8.60E-03	9.91E-03	1.13E-02	9.76E-03	7.41E-03	5.60E-03	5.03E-03	4.27E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0023***	***0.0063***	***0.0125***	***0.0111***	***0.0100***	***0.0092***	***0.0091***	***0.0082***	***0.0092***	***0.0100***	***0.0102***	***0.0118***	***0.0137***	***0.0119***	***0.0088***	***0.0064***	***0.0057***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.33E-03	1.05E-03	7.30E-04	5.52E-04	4.74E-04	7.20E-04	1.56E-03	4.22E-03	8.32E-03	7.37E-03	6.68E-03	6.11E-03	6.08E-03	5.46E-03	6.13E-03	6.70E-03	6.78E-03	7.89E-03	9.11E-03	7.92E-03	5.85E-03	4.29E-03	3.82E-03	3.28E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.67E-04	5.27E-04	3.65E-04	2.76E-04	2.37E-04	3.60E-04	7.78E-04	2.11E-03	4.16E-03	3.68E-03	3.34E-03	3.06E-03	3.04E-03	2.73E-03	3.06E-03	3.35E-03	3.39E-03	3.94E-03	4.56E-03	3.96E-03	2.93E-03	2.15E-03	1.91E-03	1.64E-03
	Emission in each Box of 1st jet	g/s	1.91E-04	1.51E-04	1.04E-04	7.89E-05	6.77E-05	1.03E-04	2.22E-04	6.04E-04	1.19E-03	1.05E-03	9.54E-04	8.73E-04	8.69E-04	7.79E-04	8.75E-04	9.57E-04	9.69E-04	1.13E-03	1.30E-03	1.13E-03	8.36E-04	6.13E-04	5.46E-04	4.69E-04
	Emission in each Box of 2nd jet	g/s	3.33E-04	2.63E-04	1.83E-04	1.38E-04	1.18E-04	1.80E-04	3.89E-04	1.06E-03	2.08E-03	1.84E-03	1.67E-03	1.53E-03	1.52E-03	1.36E-03	1.53E-03	1.67E-03	1.70E-03	1.97E-03	2.28E-03	1.98E-03	1.46E-03	1.07E-03	9.56E-04	8.21E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 085A01-085A09
Enclosure Involvec: 085P1
Road Located: 085
Vehicle EF Adopte: 085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1951	0.1627	0.1665	0.1720	0.1753	0.3434	0.3569	0.3194	0.3538	0.3424	0.3437	0.3433	0.3223	0.3055	0.3224	0.3378	0.3185	0.3393	0.3588	0.3208	0.2891	0.2668	0.2571	0.2400
	NO2	g/vehicle/km	0.0356	0.0342	0.0343	0.0348	0.0351	0.0447	0.0446	0.0492	0.0648	0.0623	0.0623	0.0614	0.0639	0.0602	0.0640	0.0670	0.0628	0.0676	0.0725	0.0652	0.0572	0.0512	0.0489	0.0464
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0107***	***0.0073***	***0.0051***	***0.0039***	***0.0034***	***0.0081***	***0.0180***	***0.0393***	***0.0647***	***0.0607***	***0.0561***	***0.0536***	***0.0476***	***0.0422***	***0.0472***	***0.0520***	***0.0511***	***0.0587***	***0.0656***	***0.0563***	***0.0416***	***0.0315***	***0.0284***	***0.0233***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.16E-03	4.84E-03	3.41E-03	2.62E-03	2.24E-03	5.40E-03	1.20E-02	2.62E-02	4.31E-02	4.05E-02	3.74E-02	3.57E-02	3.18E-02	2.81E-02	3.15E-02	3.47E-02	3.41E-02	3.91E-02	4.37E-02	3.75E-02	2.78E-02	2.10E-02	1.89E-02	1.56E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.58E-03	2.42E-03	1.70E-03	1.31E-03	1.12E-03	2.70E-03	5.99E-03	1.31E-02	2.16E-02	2.02E-02	1.87E-02	1.79E-02	1.59E-02	1.41E-02	1.57E-02	1.73E-02	1.70E-02	1.96E-02	2.19E-02	1.88E-02	1.39E-02	1.05E-02	9.45E-03	7.78E-03
	Emission in each Box of 1st jet	g/s	1.02E-03	6.92E-04	4.87E-04	3.74E-04	3.20E-04	7.71E-04	1.71E-03	3.74E-03	6.16E-03	5.78E-03	5.34E-03	5.10E-03	4.54E-03	4.02E-03	4.50E-03	4.95E-03	4.87E-03	5.59E-03	6.25E-03	5.36E-03	3.97E-03	3.00E-03	2.70E-03	2.22E-03
	Emission in each Box of 2nd jet	g/s	1.79E-03	1.21E-03	8.52E-04	6.54E-04	5.60E-04	1.35E-03	3.00E-03	6.55E-03	1.08E-02	1.01E-02	9.34E-03	8.93E-03	7.94E-03	7.03E-03	7.87E-03	8.67E-03	8.52E-03	9.78E-03	1.09E-02	9.38E-03	6.94E-03	5.25E-03	4.73E-03	3.89E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0015***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0022***	***0.0061***	***0.0119***	***0.0111***	***0.0102***	***0.0096***	***0.0094***	***0.0083***	***0.0094***	***0.0103***	***0.0101***	***0.0117***	***0.0133***	***0.0114***	***0.0082***	***0.0060***	***0.0054***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.31E-03	1.02E-03	7.02E-04	5.30E-04	4.49E-04	7.02E-04	1.50E-03	4.04E-03	7.91E-03	7.37E-03	6.78E-03	6.39E-03	6.29E-03	5.54E-03	6.25E-03	6.88E-03	6.73E-03	7.79E-03	8.83E-03	7.62E-03	5.49E-03	4.03E-03	3.60E-03	3.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.53E-04	5.09E-04	3.51E-04	2.65E-04	2.24E-04	3.51E-04	7.49E-04	2.02E-03	3.95E-03	3.68E-03	3.39E-03	3.20E-03	3.15E-03	2.77E-03	3.12E-03	3.44E-03	3.36E-03	3.90E-03	4.42E-03	3.81E-03	2.75E-03	2.02E-03	1.80E-03	1.50E-03
	Emission in each Box of 1st jet	g/s	1.87E-04	1.46E-04	1.00E-04	7.57E-05	6.41E-05	1.00E-04	2.14E-04	5.77E-04	1.13E-03	1.05E-03	9.68E-04	9.14E-04	8.99E-04	7.92E-04	8.93E-04	9.82E-04	9.61E-04	1.11E-03	1.26E-03	1.09E-03	7.85E-04	5.76E-04	5.14E-04	4.30E-04
	Emission in each Box of 2nd jet	g/s	3.27E-04	2.55E-04	1.75E-04	1.32E-04	1.12E-04	1.76E-04	3.74E-04	1.01E-03	1.98E-03	1.84E-03	1.69E-03	1.60E-03	1.57E-03	1.39E-03	1.56E-03	1.72E-03	1.68E-03	1.95E-03	2.21E-03	1.91E-03	1.37E-03	1.01E-03	9.00E-04	7.52E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 085A01-085A09
Enclosure Involvec: 085P1
Road Located: 085
Vehicle EF Adopte: 085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2062	0.1672	0.1722	0.1811	0.1858	0.3509	0.3700	0.3180	0.3572	0.3357	0.3361	0.3289	0.3135	0.3050	0.3228	0.3334	0.3395	0.3551	0.3788	0.3391	0.3028	0.2709	0.2666	0.2523
	NO2	g/vehicle/km	0.0375	0.0351	0.0354	0.0365	0.0371	0.0456	0.0461	0.0490	0.0654	0.0612	0.0610	0.0589	0.0622	0.0601	0.0640	0.0662	0.0668	0.0706	0.0763	0.0687	0.0598	0.0520	0.0506	0.0486
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0114***	***0.0075***	***0.0053***	***0.0041***	***0.0036***	***0.0083***	***0.0186***	***0.0391***	***0.0654***	***0.0595***	***0.0548***	***0.0513***	***0.0463***	***0.0421***	***0.0473***	***0.0513***	***0.0545***	***0.0614***	***0.0692***	***0.0595***	***0.0436***	***0.0320***	***0.0294***	***0.0245***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.57E-03	4.98E-03	3.53E-03	2.76E-03	2.38E-03	5.52E-03	1.24E-02	2.61E-02	4.36E-02	3.97E-02	3.65E-02	3.42E-02	3.09E-02	2.81E-02	3.15E-02	3.42E-02	3.63E-02	4.09E-02	4.61E-02	3.97E-02	2.91E-02	2.13E-02	1.96E-02	1.64E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.78E-03	2.49E-03	1.76E-03	1.38E-03	1.19E-03	2.76E-03	6.21E-03	1.30E-02	2.18E-02	1.98E-02	1.83E-02	1.71E-02	1.54E-02	1.40E-02	1.58E-02	1.71E-02	1.82E-02	2.05E-02	2.31E-02	1.98E-02	1.45E-02	1.07E-02	9.80E-03	8.18E-03
	Emission in each Box of 1st jet	g/s	1.08E-03	7.11E-04	5.04E-04	3.94E-04	3.39E-04	7.88E-04	1.78E-03	3.73E-03	6.22E-03	5.67E-03	5.22E-03	4.89E-03	4.41E-03	4.01E-03	4.51E-03	4.89E-03	5.19E-03	5.85E-03	6.59E-03	5.67E-03	4.15E-03	3.04E-03	2.80E-03	2.34E-03
	Emission in each Box of 2nd jet	g/s	1.89E-03	1.24E-03	8.81E-04	6.89E-04	5.94E-04	1.38E-03	3.11E-03	6.52E-03	1.09E-02	9.92E-03	9.14E-03	8.56E-03	7.72E-03	7.02E-03	7.88E-03	8.55E-03	9.09E-03	1.02E-02	1.15E-02	9.92E-03	7.27E-03	5.33E-03	4.90E-03	4.09E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0023***	***0.0060***	***0.0120***	***0.0108***	***0.0100***	***0.0092***	***0.0092***	***0.0083***	***0.0094***	***0.0102***	***0.0107***	***0.0122***	***0.0140***	***0.0121***	***0.0086***	***0.0061***	***0.0056***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.38E-03	1.04E-03	7.25E-04	5.56E-04	4.74E-04	7.16E-04	1.55E-03	4.02E-03	7.98E-03	7.23E-03	6.64E-03	6.13E-03	6.13E-03	5.53E-03	6.26E-03	6.79E-03	7.15E-03	8.14E-03	9.30E-03	8.04E-03	5.74E-03	4.09E-03	3.72E-03	3.15E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.89E-04	5.22E-04	3.62E-04	2.78E-04	2.37E-04	3.58E-04	7.75E-04	2.01E-03	3.99E-03	3.62E-03	3.32E-03	3.07E-03	3.06E-03	2.77E-03	3.13E-03	3.40E-03	3.58E-03	4.07E-03	4.65E-03	4.02E-03	2.87E-03	2.04E-03	1.86E-03	1.58E-03
	Emission in each Box of 1st jet	g/s	1.97E-04	1.49E-04	1.04E-04	7.94E-05	6.77E-05	1.02E-04	2.21E-04	5.75E-04	1.14E-03	1.03E-03	9.48E-04	8.76E-04	8.76E-04	7.90E-04	8.94E-04	9.70E-04	1.02E-03	1.16E-03	1.33E-03	1.15E-03	8.21E-04	5.84E-04	5.32E-04	4.50E-04
	Emission in each Box of 2nd jet	g/s	3.44E-04	2.61E-04	1.81E-04	1.39E-04	1.18E-04	1.79E-04	3.87E-04	1.01E-03	1.99E-03	1.81E-03	1.66E-03	1.53E-03	1.53E-03	1.38E-03	1.56E-03	1.70E-03	1.79E-03	2.03E-03	2.33E-03	2.01E-03	1.44E-03	1.02E-03	9.31E-04	7.88E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2048	0.1708	0.1698	0.1736	0.1849	0.3418	0.3620	0.3127	0.3422	0.3210	0.3332	0.3142	0.3083	0.2965	0.3206	0.3164	0.3060	0.3365	0.3619	0.3241	0.3025	0.2734	0.2658	0.2495
	NO2	g/vehicle/km	0.0373	0.0358	0.0349	0.0351	0.0369	0.0445	0.0452	0.0482	0.0627	0.0585	0.0605	0.0564	0.0612	0.0585	0.0636	0.0629	0.0605	0.0670	0.0731	0.0658	0.0598	0.0524	0.0505	0.0481
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0113***	***0.0076***	***0.0052***	***0.0040***	***0.0035***	***0.0081***	***0.0182***	***0.0385***	***0.0626***	***0.0569***	***0.0544***	***0.0491***	***0.0456***	***0.0409***	***0.0470***	***0.0487***	***0.0491***	***0.0582***	***0.0661***	***0.0569***	***0.0436***	***0.0323***	***0.0293***	***0.0243***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.51E-03	5.08E-03	3.48E-03	2.64E-03	2.36E-03	5.37E-03	1.22E-02	2.57E-02	4.17E-02	3.79E-02	3.62E-02	3.27E-02	3.04E-02	2.73E-02	3.13E-02	3.25E-02	3.28E-02	3.88E-02	4.41E-02	3.79E-02	2.90E-02	2.15E-02	1.95E-02	1.62E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.76E-03	2.54E-03	1.74E-03	1.32E-03	1.18E-03	2.69E-03	6.08E-03	1.28E-02	2.09E-02	1.90E-02	1.81E-02	1.64E-02	1.52E-02	1.36E-02	1.57E-02	1.62E-02	1.64E-02	1.94E-02	2.20E-02	1.90E-02	1.45E-02	1.08E-02	9.77E-03	8.09E-03
	Emission in each Box of 1st jet	g/s	1.07E-03	7.26E-04	4.97E-04	3.78E-04	3.37E-04	7.68E-04	1.74E-03	3.67E-03	5.96E-03	5.42E-03	5.18E-03	4.67E-03	4.34E-03	3.90E-03	4.47E-03	4.64E-03	4.68E-03	5.54E-03	6.30E-03	5.42E-03	4.15E-03	3.07E-03	2.79E-03	2.31E-03
	Emission in each Box of 2nd jet	g/s	1.88E-03	1.27E-03	8.69E-04	6.61E-04	5.91E-04	1.34E-03	3.04E-03	6.41E-03	1.04E-02	9.49E-03	9.06E-03	8.18E-03	7.60E-03	6.82E-03	7.83E-03	8.12E-03	8.19E-03	9.70E-03	1.10E-02	9.48E-03	7.26E-03	5.38E-03	4.89E-03	4.05E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0023***	***0.0059***	***0.0115***	***0.0104***	***0.0099***	***0.0088***	***0.0090***	***0.0081***	***0.0093***	***0.0097***	***0.0097***	***0.0116***	***0.0134***	***0.0115***	***0.0086***	***0.0062***	***0.0056***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.37E-03	1.07E-03	7.15E-04	5.34E-04	4.71E-04	6.99E-04	1.52E-03	3.96E-03	7.65E-03	6.92E-03	6.58E-03	5.87E-03	6.03E-03	5.38E-03	6.21E-03	6.45E-03	6.48E-03	7.72E-03	8.91E-03	7.70E-03	5.74E-03	4.12E-03	3.71E-03	3.12E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.84E-04	5.33E-04	3.58E-04	2.67E-04	2.36E-04	3.50E-04	7.59E-04	1.98E-03	3.83E-03	3.46E-03	3.29E-03	2.94E-03	3.01E-03	2.69E-03	3.11E-03	3.23E-03	3.24E-03	3.86E-03	4.45E-03	3.85E-03	2.87E-03	2.06E-03	1.86E-03	1.56E-03
	Emission in each Box of 1st jet	g/s	1.95E-04	1.52E-04	1.02E-04	7.63E-05	6.73E-05	9.99E-05	2.17E-04	5.65E-04	1.09E-03	9.89E-04	9.40E-04	8.39E-04	8.61E-04	7.69E-04	8.87E-04	9.21E-04	9.25E-04	1.10E-03	1.27E-03	1.10E-03	8.20E-04	5.89E-04	5.31E-04	4.46E-04
	Emission in each Box of 2nd jet	g/s	3.42E-04	2.67E-04	1.79E-04	1.34E-04	1.18E-04	1.75E-04	3.79E-04	9.89E-04	1.91E-03	1.73E-03	1.65E-03	1.47E-03	1.51E-03	1.35E-03	1.55E-03	1.61E-03	1.62E-03	1.93E-03	2.23E-03	1.92E-03	1.43E-03	1.03E-03	9.28E-04	7.80E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2331	0.1970	0.1972	0.2050	0.2137	0.4114	0.4316	0.3731	0.4067	0.3773	0.3722	0.3674	0.3514	0.3308	0.3451	0.3632	0.3523	0.3770	0.4051	0.3657	0.3393	0.3070	0.3012	0.2878
	NO2	g/vehicle/km	0.0419	0.0407	0.0399	0.0408	0.0419	0.0529	0.0533	0.0569	0.0738	0.0682	0.0671	0.0654	0.0693	0.0649	0.0681	0.0717	0.0692	0.0747	0.0813	0.0738	0.0666	0.0585	0.0568	0.0550
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0128***	***0.0088***	***0.0061***	***0.0047***	***0.0041***	***0.0097***	***0.0217***	***0.0459***	***0.0744***	***0.0669***	***0.0607***	***0.0574***	***0.0519***	***0.0457***	***0.0506***	***0.0559***	***0.0566***	***0.0652***	***0.0740***	***0.0642***	***0.0489***	***0.0362***	***0.0332***	***0.0280***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.55E-03	5.86E-03	4.04E-03	3.12E-03	2.73E-03	6.47E-03	1.45E-02	3.06E-02	4.96E-02	4.46E-02	4.05E-02	3.82E-02	3.46E-02	3.04E-02	3.37E-02	3.73E-02	3.77E-02	4.35E-02	4.94E-02	4.28E-02	3.26E-02	2.41E-02	2.21E-02	1.87E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.28E-03	2.93E-03	2.02E-03	1.56E-03	1.37E-03	3.23E-03	7.25E-03	1.53E-02	2.48E-02	2.23E-02	2.02E-02	1.91E-02	1.73E-02	1.52E-02	1.69E-02	1.86E-02	1.89E-02	2.17E-02	2.47E-02	2.14E-02	1.63E-02	1.21E-02	1.11E-02	9.33E-03
	Emission in each Box of 1st jet	g/s	1.22E-03	8.38E-04	5.77E-04	4.46E-04	3.90E-04	9.24E-04	2.07E-03	4.37E-03	7.08E-03	6.37E-03	5.78E-03	5.46E-03	4.95E-03	4.35E-03	4.82E-03	5.32E-03	5.39E-03	6.21E-03	7.05E-03	6.11E-03	4.65E-03	3.45E-03	3.16E-03	2.67E-03
	Emission in each Box of 2nd jet	g/s	2.14E-03	1.47E-03	1.01E-03	7.80E-04	6.83E-04	1.62E-03	3.62E-03	7.65E-03	1.24E-02	1.12E-02	1.01E-02	9.56E-03	8.66E-03	7.61E-03	8.43E-03	9.32E-03	9.43E-03	1.09E-02	1.23E-02	1.07E-02	8.14E-03	6.04E-03	5.54E-03	4.67E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0027***	***0.0070***	***0.0135***	***0.0121***	***0.0110***	***0.0102***	***0.0102***	***0.0090***	***0.0100***	***0.0110***	***0.0111***	***0.0129***	***0.0149***	***0.0130***	***0.0096***	***0.0069***	***0.0063***	***0.0054***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-03	1.21E-03	8.17E-04	6.21E-04	5.36E-04	8.32E-04	1.79E-03	4.67E-03	9.00E-03	8.06E-03	7.30E-03	6.81E-03	6.83E-03	5.97E-03	6.66E-03	7.36E-03	7.40E-03	8.61E-03	9.91E-03	8.63E-03	6.39E-03	4.60E-03	4.17E-03	3.57E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.70E-04	6.05E-04	4.09E-04	3.10E-04	2.68E-04	4.16E-04	8.95E-04	2.34E-03	4.50E-03	4.03E-03	3.65E-03	3.41E-03	3.41E-03	2.99E-03	3.33E-03	3.68E-03	3.70E-03	4.30E-03	4.95E-03	4.32E-03	3.20E-03	2.30E-03	2.09E-03	1.78E-03
	Emission in each Box of 1st jet	g/s	2.20E-04	1.73E-04	1.17E-04	8.87E-05	7.65E-05	1.19E-04	2.56E-04	6.67E-04	1.29E-03	1.15E-03	1.04E-03	9.73E-04	9.75E-04	8.53E-04	9.51E-04	1.05E-03	1.06E-03	1.23E-03	1.42E-03	1.23E-03	9.13E-04	6.57E-04	5.96E-04	5.10E-04
	Emission in each Box of 2nd jet	g/s	3.85E-04	3.03E-04	2.04E-04	1.55E-04	1.34E-04	2.08E-04	4.47E-04	1.17E-03	2.25E-03	2.02E-03	1.83E-03	1.70E-03	1.71E-03	1.49E-03	1.66E-03	1.84E-03	1.85E-03	2.15E-03	2.48E-03	2.16E-03	1.60E-03	1.15E-03	1.04E-03	8.92E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2549	0.2115	0.2147	0.2246	0.2335	0.4450	0.4716	0.4033	0.4394	0.4064	0.4021	0.3912	0.3761	0.3574	0.3745	0.3878	0.3774	0.4013	0.4312	0.3959	0.3632	0.3347	0.3267	0.3104
	NO2	g/vehicle/km	0.0455	0.0434	0.0431	0.0442	0.0454	0.0570	0.0580	0.0613	0.0793	0.0731	0.0720	0.0693	0.0737	0.0696	0.0735	0.0762	0.0737	0.0791	0.0862	0.0795	0.0709	0.0633	0.0612	0.0589
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0140***	***0.0094***	***0.0066***	***0.0051***	***0.0045***	***0.0105***	***0.0238***	***0.0496***	***0.0804***	***0.0721***	***0.0656***	***0.0611***	***0.0556***	***0.0493***	***0.0549***	***0.0597***	***0.0606***	***0.0694***	***0.0788***	***0.0695***	***0.0523***	***0.0395***	***0.0360***	***0.0302***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.35E-03	6.29E-03	4.40E-03	3.42E-03	2.98E-03	7.00E-03	1.58E-02	3.31E-02	5.36E-02	4.80E-02	4.37E-02	4.07E-02	3.71E-02	3.29E-02	3.66E-02	3.98E-02	4.04E-02	4.63E-02	5.25E-02	4.63E-02	3.49E-02	2.63E-02	2.40E-02	2.01E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.68E-03	3.15E-03	2.20E-03	1.71E-03	1.49E-03	3.50E-03	7.92E-03	1.65E-02	2.68E-02	2.40E-02	2.19E-02	2.04E-02	1.85E-02	1.64E-02	1.83E-02	1.99E-02	2.02E-02	2.31E-02	2.63E-02	2.32E-02	1.74E-02	1.32E-02	1.20E-02	1.01E-02
	Emission in each Box of 1st jet	g/s	1.34E-03	8.99E-04	6.28E-04	4.88E-04	4.26E-04	1.00E-03	2.26E-03	4.73E-03	7.66E-03	6.86E-03	6.25E-03	5.82E-03	5.29E-03	4.70E-03	5.23E-03	5.68E-03	5.77E-03	6.61E-03	7.50E-03	6.62E-03	4.98E-03	3.76E-03	3.43E-03	2.88E-03
	Emission in each Box of 2nd jet	g/s	2.34E-03	1.57E-03	1.10E-03	8.54E-04	7.46E-04	1.75E-03	3.96E-03	8.27E-03	1.34E-02	1.20E-02	1.09E-02	1.02E-02	9.26E-03	8.22E-03	9.15E-03	9.95E-03	1.01E-02	1.16E-02	1.31E-02	1.16E-02	8.72E-03	6.58E-03	6.01E-03	5.03E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0019***	***0.0013***	***0.0010***	***0.0009***	***0.0013***	***0.0029***	***0.0075***	***0.0145***	***0.0130***	***0.0118***	***0.0108***	***0.0109***	***0.0096***	***0.0108***	***0.0117***	***0.0118***	***0.0137***	***0.0158***	***0.0139***	***0.0102***	***0.0075***	***0.0068***	***0.0057***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.67E-03	1.29E-03	8.82E-04	6.73E-04	5.80E-04	8.96E-04	1.95E-03	5.03E-03	9.67E-03	8.64E-03	7.84E-03	7.21E-03	7.26E-03	6.40E-03	7.18E-03	7.82E-03	7.88E-03	9.12E-03	1.05E-02	9.30E-03	6.81E-03	4.98E-03	4.50E-03	3.82E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.36E-04	6.46E-04	4.41E-04	3.36E-04	2.90E-04	4.48E-04	9.73E-04	2.52E-03	4.84E-03	4.32E-03	3.92E-03	3.61E-03	3.63E-03	3.20E-03	3.59E-03	3.91E-03	3.94E-03	4.56E-03	5.25E-03	4.65E-03	3.40E-03	2.49E-03	2.25E-03	1.91E-03
	Emission in each Box of 1st jet	g/s	2.39E-04	1.85E-04	1.26E-04	9.61E-05	8.29E-05	1.28E-04	2.78E-04	7.19E-04	1.38E-03	1.23E-03	1.12E-03	1.03E-03	1.04E-03	9.15E-04	1.03E-03	1.12E-03	1.13E-03	1.30E-03	1.50E-03	1.33E-03	9.72E-04	7.12E-04	6.43E-04	5.46E-04
	Emission in each Box of 2nd jet	g/s	4.18E-04	3.23E-04	2.20E-04	1.68E-04	1.45E-04	2.24E-04	4.87E-04	1.26E-03	2.42E-03	2.16E-03	1.96E-03	1.80E-03	1.82E-03	1.60E-03	1.79E-03	1.95E-03	1.97E-03	2.28E-03	2.63E-03	2.32E-03	1.70E-03	1.25E-03	1.13E-03	9.56E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2648	0.2212	0.2246	0.2353	0.2435	0.4586	0.4859	0.4178	0.4523	0.4179	0.4134	0.4050	0.3872	0.3662	0.3840	0.3984	0.3903	0.4190	0.4449	0.4081	0.3752	0.3457	0.3379	0.3223
	NO2	g/vehicle/km	0.0469	0.0449	0.0445	0.0457	0.0468	0.0584	0.0594	0.0631	0.0812	0.0747	0.0736	0.0713	0.0754	0.0710	0.0750	0.0779	0.0758	0.0821	0.0884	0.0815	0.0728	0.0650	0.0629	0.0608
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0146***	***0.0099***	***0.0069***	***0.0054***	***0.0047***	***0.0108***	***0.0245***	***0.0514***	***0.0827***	***0.0741***	***0.0674***	***0.0632***	***0.0572***	***0.0505***	***0.0563***	***0.0613***	***0.0627***	***0.0725***	***0.0813***	***0.0716***	***0.0540***	***0.0408***	***0.0373***	***0.0314***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.72E-03	6.58E-03	4.60E-03	3.58E-03	3.11E-03	7.21E-03	1.63E-02	3.43E-02	5.52E-02	4.94E-02	4.50E-02	4.22E-02	3.82E-02	3.37E-02	3.75E-02	4.09E-02	4.18E-02	4.83E-02	5.42E-02	4.78E-02	3.60E-02	2.72E-02	2.48E-02	2.09E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.86E-03	3.29E-03	2.30E-03	1.79E-03	1.56E-03	3.61E-03	8.16E-03	1.71E-02	2.76E-02	2.47E-02	2.25E-02	2.11E-02	1.91E-02	1.68E-02	1.88E-02	2.04E-02	2.09E-02	2.42E-02	2.71E-02	2.39E-02	1.80E-02	1.36E-02	1.24E-02	1.05E-02
	Emission in each Box of 1st jet	g/s	1.39E-03	9.40E-04	6.57E-04	5.12E-04	4.45E-04	1.03E-03	2.33E-03	4.90E-03	7.88E-03	7.06E-03	6.42E-03	6.02E-03	5.45E-03	4.81E-03	5.36E-03	5.84E-03	5.97E-03	6.90E-03	7.74E-03	6.82E-03	5.15E-03	3.88E-03	3.55E-03	2.99E-03
	Emission in each Box of 2nd jet	g/s	2.43E-03	1.65E-03	1.15E-03	8.95E-04	7.78E-04	1.80E-03	4.08E-03	8.57E-03	1.38E-02	1.24E-02	1.12E-02	1.05E-02	9.54E-03	8.42E-03	9.38E-03	1.02E-02	1.04E-02	1.21E-02	1.36E-02	1.19E-02	9.01E-03	6.80E-03	6.21E-03	5.23E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0010***	***0.0009***	***0.0014***	***0.0030***	***0.0078***	***0.0148***	***0.0132***	***0.0120***	***0.0111***	***0.0111***	***0.0098***	***0.0110***	***0.0120***	***0.0122***	***0.0142***	***0.0162***	***0.0143***	***0.0105***	***0.0077***	***0.0069***	***0.0059***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.72E-03	1.34E-03	9.11E-04	6.96E-04	5.98E-04	9.18E-04	1.99E-03	5.18E-03	9.90E-03	8.83E-03	8.01E-03	7.42E-03	7.43E-03	6.53E-03	7.33E-03	8.00E-03	8.11E-03	9.47E-03	1.08E-02	9.53E-03	6.99E-03	5.11E-03	4.63E-03	3.94E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.61E-04	6.68E-04	4.55E-04	3.48E-04	2.99E-04	4.59E-04	9.97E-04	2.59E-03	4.95E-03	4.41E-03	4.00E-03	3.71E-03	3.72E-03	3.27E-03	3.67E-03	4.00E-03	4.06E-03	4.73E-03	5.39E-03	4.76E-03	3.50E-03	2.56E-03	2.31E-03	1.97E-03
	Emission in each Box of 1st jet	g/s	2.46E-04	1.91E-04	1.30E-04	9.94E-05	8.54E-05	1.31E-04	2.85E-04	7.39E-04	1.41E-03	1.26E-03	1.14E-03	1.06E-03	1.06E-03	9.33E-04	1.05E-03	1.14E-03	1.16E-03	1.35E-03	1.54E-03	1.36E-03	9.99E-04	7.31E-04	6.61E-04	5.64E-04
	Emission in each Box of 2nd jet	g/s	4.31E-04	3.34E-04	2.28E-04	1.74E-04	1.50E-04	2.29E-04	4.98E-04	1.29E-03	2.47E-03	2.21E-03	2.00E-03	1.85E-03	1.86E-03	1.63E-03	1.83E-03	2.00E-03	2.03E-03	2.37E-03	2.69E-03	2.38E-03	1.75E-03	1.28E-03	1.16E-03	9.86E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																								
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2677	0.2254	0.2279	0.2394	0.2471	0.4642	0.4907	0.4240	0.4575	0.4225	0.4158	0.4101	0.3907	0.3711	0.3894	0.4041	0.4000	0.4278	0.4544	0.4155	0.3831	0.3530	0.3417	0.3239
	NO2	g/vehicle/km	0.0473	0.0455	0.0450	0.0463	0.0473	0.0589	0.0599	0.0638	0.0819	0.0753	0.0739	0.0720	0.0759	0.0717	0.0757	0.0787	0.0774	0.0835	0.0900	0.0826	0.0741	0.0662	0.0634	0.0610
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0070***	***0.0048***	***0.0033***	***0.0026***	***0.0023***	***0.0050***	***0.0112***	***0.0244***	***0.0395***	***0.0354***	***0.0319***	***0.0302***	***0.0362***	***0.0322***	***0.0358***	***0.0391***	***0.0404***	***0.0466***	***0.0523***	***0.0460***	***0.0347***	***0.0261***	***0.0237***	***0.0199***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.64E-03	3.19E-03	2.22E-03	1.73E-03	1.51E-03	3.33E-03	7.47E-03	1.63E-02	2.64E-02	2.36E-02	2.13E-02	2.01E-02	2.41E-02	2.15E-02	2.39E-02	2.61E-02	2.70E-02	3.11E-02	3.49E-02	3.07E-02	2.31E-02	1.74E-02	1.58E-02	1.32E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.32E-03	1.60E-03	1.11E-03	8.63E-04	7.53E-04	1.66E-03	3.73E-03	8.14E-03	1.32E-02	1.18E-02	1.06E-02	1.01E-02	1.21E-02	1.07E-02	1.19E-02	1.30E-02	1.35E-02	1.55E-02	1.74E-02	1.53E-02	1.16E-02	8.72E-03	7.90E-03	6.62E-03
	Emission in each Box of 1st jet	g/s	2.90E-04	1.99E-04	1.38E-04	1.08E-04	9.42E-05	2.08E-04	4.67E-04	1.02E-03	1.65E-03	1.48E-03	1.33E-03	1.26E-03	1.51E-03	1.34E-03	1.49E-03	1.63E-03	1.68E-03	1.94E-03	2.18E-03	1.92E-03	1.45E-03	1.09E-03	9.88E-04	8.28E-04
	Emission in each Box of 2nd jet	g/s	1.55E-04	1.06E-04	7.38E-05	5.75E-05	5.02E-05	1.11E-04	2.49E-04	5.42E-04	8.79E-04	7.87E-04	7.10E-04	6.70E-04	8.05E-04	7.15E-04	7.95E-04	8.69E-04	8.98E-04	1.04E-03	1.16E-03	1.02E-03	7.71E-04	5.81E-04	5.27E-04	4.42E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0014***	***0.0037***	***0.0071***	***0.0063***	***0.0057***	***0.0053***	***0.0070***	***0.0062***	***0.0070***	***0.0076***	***0.0078***	***0.0091***	***0.0104***	***0.0091***	***0.0067***	***0.0049***	***0.0044***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.19E-04	6.44E-04	4.37E-04	3.34E-04	2.88E-04	4.22E-04	9.11E-04	2.45E-03	4.72E-03	4.21E-03	3.79E-03	3.53E-03	4.69E-03	4.15E-03	4.64E-03	5.08E-03	5.22E-03	6.07E-03	6.91E-03	6.10E-03	4.47E-03	3.27E-03	2.93E-03	2.49E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.09E-04	3.22E-04	2.19E-04	1.67E-04	1.44E-04	2.11E-04	4.56E-04	1.22E-03	2.36E-03	2.11E-03	1.89E-03	1.77E-03	2.35E-03	2.07E-03	2.32E-03	2.54E-03	2.61E-03	3.03E-03	3.46E-03	3.05E-03	2.24E-03	1.63E-03	1.47E-03	1.25E-03
	Emission in each Box of 1st jet	g/s	5.12E-05	4.03E-05	2.73E-05	2.09E-05	1.80E-05	2.64E-05	5.70E-05	1.53E-04	2.95E-04	2.63E-04	2.37E-04	2.21E-04	2.93E-04	2.59E-04	2.90E-04	3.17E-04	3.26E-04	3.79E-04	4.32E-04	3.81E-04	2.80E-04	2.04E-04	1.83E-04	1.56E-04
	Emission in each Box of 2nd jet	g/s	2.73E-05	2.15E-05	1.46E-05	1.11E-05	9.61E-06	1.41E-05	3.04E-05	8.17E-05	1.57E-04	1.40E-04	1.26E-04	1.18E-04	1.56E-04	1.38E-04	1.55E-04	1.69E-04	1.74E-04	2.02E-04	2.30E-04	2.03E-04	1.49E-04	1.09E-04	9.78E-05	8.31E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2446	0.2050	0.2064	0.2178	0.2313	0.4405	0.4677	0.4007	0.4333	0.4049	0.3999	0.3925	0.3728	0.3498	0.3695	0.3847	0.3805	0.4021	0.4173	0.3810	0.3495	0.3227	0.3125	0.2959
	NO2	g/vehicle/km	0.0438	0.0420	0.0414	0.0429	0.0449	0.0564	0.0574	0.0609	0.0783	0.0727	0.0716	0.0694	0.0730	0.0682	0.0725	0.0756	0.0742	0.0792	0.0835	0.0765	0.0683	0.0611	0.0587	0.0563
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0064***	***0.0044***	***0.0030***	***0.0024***	***0.0021***	***0.0047***	***0.0107***	***0.0231***	***0.0374***	***0.0340***	***0.0307***	***0.0289***	***0.0345***	***0.0303***	***0.0340***	***0.0372***	***0.0385***	***0.0438***	***0.0480***	***0.0422***	***0.0317***	***0.0239***	***0.0217***	***0.0181***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.23E-03	2.90E-03	2.01E-03	1.57E-03	1.41E-03	3.16E-03	7.12E-03	1.54E-02	2.50E-02	2.26E-02	2.05E-02	1.92E-02	2.30E-02	2.02E-02	2.26E-02	2.48E-02	2.56E-02	2.92E-02	3.20E-02	2.81E-02	2.11E-02	1.59E-02	1.45E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.12E-03	1.45E-03	1.00E-03	7.85E-04	7.05E-04	1.58E-03	3.56E-03	7.69E-03	1.25E-02	1.13E-02	1.02E-02	9.62E-03	1.15E-02	1.01E-02	1.13E-02	1.24E-02	1.28E-02	1.46E-02	1.60E-02	1.41E-02	1.06E-02	7.97E-03	7.23E-03	6.05E-03
	Emission in each Box of 1st jet	g/s	2.65E-04	1.81E-04	1.25E-04	9.81E-05	8.81E-05	1.97E-04	4.45E-04	9.61E-04	1.56E-03	1.41E-03	1.28E-03	1.20E-03	1.44E-03	1.26E-03	1.42E-03	1.55E-03	1.60E-03	1.83E-03	2.00E-03	1.76E-03	1.32E-03	9.96E-04	9.04E-04	7.56E-04
	Emission in each Box of 2nd jet	g/s	1.41E-04	9.67E-05	6.69E-05	5.23E-05	4.70E-05	1.05E-04	2.37E-04	5.13E-04	8.32E-04	7.55E-04	6.83E-04	6.42E-04	7.68E-04	6.74E-04	7.55E-04	8.27E-04	8.54E-04	9.73E-04	1.07E-03	9.37E-04	7.03E-04	5.31E-04	4.82E-04	4.03E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0035***	***0.0068***	***0.0061***	***0.0055***	***0.0051***	***0.0068***	***0.0059***	***0.0067***	***0.0073***	***0.0075***	***0.0086***	***0.0096***	***0.0085***	***0.0062***	***0.0045***	***0.0041***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.58E-04	5.95E-04	4.03E-04	3.09E-04	2.74E-04	4.04E-04	8.74E-04	2.34E-03	4.51E-03	4.07E-03	3.67E-03	3.40E-03	4.51E-03	3.94E-03	4.44E-03	4.87E-03	5.00E-03	5.75E-03	6.41E-03	5.65E-03	4.13E-03	3.02E-03	2.71E-03	2.30E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.79E-04	2.97E-04	2.01E-04	1.55E-04	1.37E-04	2.02E-04	4.37E-04	1.17E-03	2.25E-03	2.03E-03	1.83E-03	1.70E-03	2.26E-03	1.97E-03	2.22E-03	2.44E-03	2.50E-03	2.87E-03	3.20E-03	2.82E-03	2.06E-03	1.51E-03	1.36E-03	1.15E-03
	Emission in each Box of 1st jet	g/s	4.74E-05	3.72E-05	2.52E-05	1.93E-05	1.71E-05	2.52E-05	5.47E-05	1.46E-04	2.82E-04	2.54E-04	2.29E-04	2.13E-04	2.82E-04	2.46E-04	2.78E-04	3.04E-04	3.12E-04	3.59E-04	4.01E-04	3.53E-04	2.58E-04	1.89E-04	1.70E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	2.53E-05	1.98E-05	1.34E-05	1.03E-05	9.14E-06	1.35E-05	2.91E-05	7.79E-05	1.50E-04	1.36E-04	1.22E-04	1.13E-04	1.50E-04	1.31E-04	1.48E-04	1.62E-04	1.67E-04	1.92E-04	2.14E-04	1.88E-04	1.38E-04	1.01E-04	9.05E-05	7.68E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2469	0.2048	0.2065	0.2183	0.2271	0.4299	0.4531	0.3946	0.4255	0.3933	0.3797	0.3736	0.3545	0.3369	0.3533	0.3681	0.3657	0.3903	0.4153	0.3815	0.3540	0.3236	0.3185	0.3026
	NO2	g/vehicle/km	0.0442	0.0421	0.0416	0.0430	0.0442	0.0551	0.0558	0.0600	0.0770	0.0708	0.0683	0.0664	0.0698	0.0659	0.0696	0.0726	0.0716	0.0771	0.0832	0.0767	0.0692	0.0614	0.0598	0.0576
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0064***	***0.0043***	***0.0030***	***0.0024***	***0.0021***	***0.0046***	***0.0103***	***0.0227***	***0.0368***	***0.0330***	***0.0292***	***0.0275***	***0.0329***	***0.0292***	***0.0325***	***0.0356***	***0.0370***	***0.0425***	***0.0478***	***0.0422***	***0.0321***	***0.0240***	***0.0221***	***0.0186***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.27E-03	2.90E-03	2.01E-03	1.57E-03	1.38E-03	3.08E-03	6.90E-03	1.51E-02	2.45E-02	2.20E-02	1.94E-02	1.83E-02	2.19E-02	1.95E-02	2.16E-02	2.37E-02	2.46E-02	2.83E-02	3.19E-02	2.81E-02	2.14E-02	1.60E-02	1.47E-02	1.24E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.14E-03	1.45E-03	1.00E-03	7.87E-04	6.92E-04	1.54E-03	3.45E-03	7.57E-03	1.23E-02	1.10E-02	9.72E-03	9.16E-03	1.10E-02	9.74E-03	1.08E-02	1.19E-02	1.23E-02	1.42E-02	1.59E-02	1.41E-02	1.07E-02	7.99E-03	7.37E-03	6.19E-03
	Emission in each Box of 1st jet	g/s	2.67E-04	1.81E-04	1.25E-04	9.83E-05	8.65E-05	1.93E-04	4.31E-04	9.47E-04	1.53E-03	1.37E-03	1.22E-03	1.15E-03	1.37E-03	1.22E-03	1.35E-03	1.48E-03	1.54E-03	1.77E-03	1.99E-03	1.76E-03	1.34E-03	9.99E-04	9.21E-04	7.74E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	9.66E-05	6.69E-05	5.24E-05	4.62E-05	1.03E-04	2.30E-04	5.05E-04	8.17E-04	7.33E-04	6.48E-04	6.11E-04	7.30E-04	6.49E-04	7.22E-04	7.91E-04	8.21E-04	9.45E-04	1.06E-03	9.38E-04	7.13E-04	5.33E-04	4.91E-04	4.13E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0035***	***0.0067***	***0.0059***	***0.0052***	***0.0049***	***0.0065***	***0.0057***	***0.0064***	***0.0070***	***0.0072***	***0.0084***	***0.0096***	***0.0085***	***0.0063***	***0.0045***	***0.0041***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.65E-04	5.96E-04	4.04E-04	3.10E-04	2.70E-04	3.95E-04	8.49E-04	2.30E-03	4.43E-03	3.96E-03	3.50E-03	3.26E-03	4.31E-03	3.81E-03	4.27E-03	4.68E-03	4.82E-03	5.60E-03	6.39E-03	5.66E-03	4.18E-03	3.03E-03	2.77E-03	2.35E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.83E-04	2.98E-04	2.02E-04	1.55E-04	1.35E-04	1.97E-04	4.25E-04	1.15E-03	2.22E-03	1.98E-03	1.75E-03	1.63E-03	2.16E-03	1.91E-03	2.13E-03	2.34E-03	2.41E-03	2.80E-03	3.19E-03	2.83E-03	2.09E-03	1.52E-03	1.38E-03	1.18E-03
	Emission in each Box of 1st jet	g/s	4.78E-05	3.73E-05	2.53E-05	1.94E-05	1.68E-05	2.47E-05	5.31E-05	1.44E-04	2.77E-04	2.48E-04	2.19E-04	2.04E-04	2.70E-04	2.38E-04	2.67E-04	2.92E-04	3.01E-04	3.50E-04	3.99E-04	3.54E-04	2.61E-04	1.89E-04	1.73E-04	1.47E-04
	Emission in each Box of 2nd jet	g/s	2.55E-05	1.99E-05	1.35E-05	1.03E-05	8.99E-06	1.32E-05	2.83E-05	7.67E-05	1.48E-04	1.32E-04	1.17E-04	1.09E-04	1.44E-04	1.27E-04	1.42E-04	1.56E-04	1.61E-04	1.87E-04	2.13E-04	1.89E-04	1.39E-04	1.01E-04	9.22E-05	7.85E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involvec	085P2
Road Located	087
Vehicle EF Adopte	085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2272	0.1907	0.1942	0.2051	0.2136	0.4091	0.4380	0.3944	0.4234	0.3931	0.3851	0.3747	0.3501	0.3337	0.3461	0.3608	0.3598	0.3789	0.3977	0.3606	0.3316	0.3024	0.2916	0.2715
	NO2	g/vehicle/km	0.0411	0.0396	0.0394	0.0408	0.0420	0.0526	0.0541	0.0601	0.0767	0.0710	0.0694	0.0667	0.0691	0.0655	0.0684	0.0713	0.0706	0.0751	0.0800	0.0729	0.0652	0.0577	0.0551	0.0521
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0059***	***0.0040***	***0.0028***	***0.0022***	***0.0020***	***0.0044***	***0.0100***	***0.0227***	***0.0366***	***0.0330***	***0.0296***	***0.0276***	***0.0325***	***0.0289***	***0.0318***	***0.0349***	***0.0364***	***0.0413***	***0.0458***	***0.0399***	***0.0300***	***0.0224***	***0.0202***	***0.0167***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.93E-03	2.70E-03	1.89E-03	1.48E-03	1.30E-03	2.93E-03	6.67E-03	1.51E-02	2.44E-02	2.20E-02	1.97E-02	1.84E-02	2.16E-02	1.93E-02	2.12E-02	2.33E-02	2.42E-02	2.75E-02	3.05E-02	2.66E-02	2.00E-02	1.49E-02	1.35E-02	1.11E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.97E-03	1.35E-03	9.44E-04	7.39E-04	6.51E-04	1.47E-03	3.33E-03	7.57E-03	1.22E-02	1.10E-02	9.86E-03	9.19E-03	1.08E-02	9.65E-03	1.06E-02	1.16E-02	1.21E-02	1.38E-02	1.53E-02	1.33E-02	1.00E-02	7.47E-03	6.75E-03	5.55E-03
	Emission in each Box of 1st jet	g/s	2.46E-04	1.69E-04	1.18E-04	9.24E-05	8.14E-05	1.83E-04	4.17E-04	9.46E-04	1.52E-03	1.37E-03	1.23E-03	1.15E-03	1.35E-03	1.21E-03	1.33E-03	1.45E-03	1.52E-03	1.72E-03	1.91E-03	1.66E-03	1.25E-03	9.33E-04	8.43E-04	6.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	9.00E-05	6.29E-05	4.93E-05	4.34E-05	9.77E-05	2.22E-04	5.05E-04	8.13E-04	7.33E-04	6.57E-04	6.12E-04	7.21E-04	6.43E-04	7.07E-04	7.75E-04	8.08E-04	9.17E-04	1.02E-03	8.87E-04	6.68E-04	4.98E-04	4.50E-04	3.70E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0035***	***0.0066***	***0.0060***	***0.0053***	***0.0049***	***0.0064***	***0.0057***	***0.0063***	***0.0069***	***0.0071***	***0.0082***	***0.0092***	***0.0081***	***0.0059***	***0.0043***	***0.0038***	***0.0032***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.11E-04	5.60E-04	3.83E-04	2.94E-04	2.56E-04	3.77E-04	8.23E-04	2.31E-03	4.42E-03	3.97E-03	3.55E-03	3.27E-03	4.27E-03	3.79E-03	4.19E-03	4.60E-03	4.76E-03	5.45E-03	6.14E-03	5.38E-03	3.94E-03	2.85E-03	2.55E-03	2.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.56E-04	2.80E-04	1.92E-04	1.47E-04	1.28E-04	1.89E-04	4.12E-04	1.15E-03	2.21E-03	1.98E-03	1.78E-03	1.64E-03	2.13E-03	1.89E-03	2.10E-03	2.30E-03	2.38E-03	2.73E-03	3.07E-03	2.69E-03	1.97E-03	1.42E-03	1.27E-03	1.07E-03
	Emission in each Box of 1st jet	g/s	4.44E-05	3.50E-05	2.40E-05	1.84E-05	1.60E-05	2.36E-05	5.14E-05	1.44E-04	2.76E-04	2.48E-04	2.22E-04	2.04E-04	2.67E-04	2.37E-04	2.62E-04	2.87E-04	2.97E-04	3.41E-04	3.84E-04	3.36E-04	2.46E-04	1.78E-04	1.59E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	2.37E-05	1.87E-05	1.28E-05	9.81E-06	8.53E-06	1.26E-05	2.74E-05	7.69E-05	1.47E-04	1.32E-04	1.18E-04	1.09E-04	1.42E-04	1.26E-04	1.40E-04	1.53E-04	1.59E-04	1.82E-04	2.05E-04	1.79E-04	1.31E-04	9.50E-05	8.50E-05	7.10E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involvec	085P2
Road Located	087
Vehicle EF Adopte	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2188	0.1778	0.1783	0.1861	0.1932	0.3688	0.3891	0.3397	0.3746	0.3474	0.3444	0.3394	0.3223	0.3000	0.3194	0.3293	0.3236	0.3394	0.3575	0.3287	0.3050	0.2841	0.2763	0.2597
	NO2	g/vehicle/km	0.0396	0.0372	0.0365	0.0374	0.0384	0.0478	0.0484	0.0522	0.0684	0.0632	0.0624	0.0608	0.0639	0.0592	0.0634	0.0654	0.0638	0.0676	0.0723	0.0667	0.0602	0.0544	0.0524	0.0500
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0057***	***0.0038***	***0.0026***	***0.0020***	***0.0018***	***0.0040***	***0.0089***	***0.0196***	***0.0324***	***0.0291***	***0.0265***	***0.0250***	***0.0299***	***0.0260***	***0.0294***	***0.0319***	***0.0327***	***0.0370***	***0.0412***	***0.0364***	***0.0276***	***0.0210***	***0.0192***	***0.0159***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.79E-03	2.52E-03	1.73E-03	1.34E-03	1.18E-03	2.64E-03	5.92E-03	1.30E-02	2.16E-02	1.94E-02	1.76E-02	1.66E-02	1.99E-02	1.73E-02	1.96E-02	2.12E-02	2.18E-02	2.46E-02	2.74E-02	2.42E-02	1.84E-02	1.40E-02	1.28E-02	1.06E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.89E-03	1.26E-03	8.67E-04	6.70E-04	5.89E-04	1.32E-03	2.96E-03	6.52E-03	1.08E-02	9.71E-03	8.82E-03	8.32E-03	9.96E-03	8.67E-03	9.79E-03	1.06E-02	1.09E-02	1.23E-02	1.37E-02	1.21E-02	9.21E-03	7.02E-03	6.39E-03	5.31E-03
	Emission in each Box of 1st jet	g/s	2.37E-04	1.57E-04	1.08E-04	8.38E-05	7.36E-05	1.65E-04	3.70E-04	8.15E-04	1.35E-03	1.21E-03	1.10E-03	1.04E-03	1.24E-03	1.08E-03	1.22E-03	1.33E-03	1.36E-03	1.54E-03	1.72E-03	1.52E-03	1.15E-03	8.77E-04	7.99E-04	6.64E-04
	Emission in each Box of 2nd jet	g/s	1.26E-04	8.39E-05	5.78E-05	4.47E-05	3.93E-05	8.81E-05	1.97E-04	4.35E-04	7.19E-04	6.47E-04	5.88E-04	5.55E-04	6.64E-04	5.78E-04	6.52E-04	7.08E-04	7.27E-04	8.22E-04	9.15E-04	8.08E-04	6.14E-04	4.68E-04	4.26E-04	3.54E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0030***	***0.0059***	***0.0053***	***0.0048***	***0.0045***	***0.0059***	***0.0051***	***0.0058***	***0.0063***	***0.0064***	***0.0074***	***0.0083***	***0.0074***	***0.0055***	***0.0040***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.86E-04	5.26E-04	3.55E-04	2.70E-04	2.34E-04	3.42E-04	7.37E-04	2.00E-03	3.94E-03	3.53E-03	3.20E-03	2.98E-03	3.95E-03	3.42E-03	3.88E-03	4.22E-03	4.30E-03	4.91E-03	5.55E-03	4.92E-03	3.64E-03	2.69E-03	2.43E-03	2.04E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.43E-04	2.63E-04	1.78E-04	1.35E-04	1.17E-04	1.71E-04	3.68E-04	1.00E-03	1.97E-03	1.77E-03	1.60E-03	1.49E-03	1.97E-03	1.71E-03	1.94E-03	2.11E-03	2.15E-03	2.45E-03	2.77E-03	2.46E-03	1.82E-03	1.34E-03	1.21E-03	1.02E-03
	Emission in each Box of 1st jet	g/s	4.29E-05	3.29E-05	2.22E-05	1.69E-05	1.46E-05	2.14E-05	4.61E-05	1.25E-04	2.46E-04	2.21E-04	2.00E-04	1.86E-04	2.47E-04	2.14E-04	2.43E-04	2.64E-04	2.69E-04	3.07E-04	3.47E-04	3.08E-04	2.27E-04	1.68E-04	1.52E-04	1.28E-04
	Emission in each Box of 2nd jet	g/s	2.29E-05	1.75E-05	1.18E-05	8.99E-06	7.81E-06	1.14E-05	2.46E-05	6.68E-05	1.31E-04	1.18E-04	1.07E-04	9.93E-05	1.32E-04	1.14E-04	1.29E-04	1.41E-04	1.43E-04	1.64E-04	1.85E-04	1.64E-04	1.21E-04	8.96E-05	8.09E-05	6.81E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1995	0.1685	0.1737	0.1796	0.1858	0.3523	0.3716	0.3345	0.3732	0.3423	0.3383	0.3276	0.3110	0.3008	0.3162	0.3287	0.3213	0.3437	0.3708	0.3336	0.3088	0.2849	0.2738	0.2632
	NO2	g/vehicle/km	0.0363	0.0354	0.0357	0.0363	0.0371	0.0458	0.0463	0.0515	0.0682	0.0623	0.0614	0.0587	0.0617	0.0593	0.0627	0.0653	0.0634	0.0684	0.0748	0.0677	0.0609	0.0546	0.0520	0.0506
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0052***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0038***	***0.0085***	***0.0193***	***0.0323***	***0.0287***	***0.0260***	***0.0241***	***0.0288***	***0.0261***	***0.0291***	***0.0318***	***0.0325***	***0.0374***	***0.0427***	***0.0369***	***0.0280***	***0.0211***	***0.0190***	***0.0161***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.45E-03	2.39E-03	1.69E-03	1.29E-03	1.13E-03	2.52E-03	5.66E-03	1.28E-02	2.15E-02	1.91E-02	1.73E-02	1.61E-02	1.92E-02	1.74E-02	1.94E-02	2.12E-02	2.16E-02	2.50E-02	2.85E-02	2.46E-02	1.86E-02	1.41E-02	1.27E-02	1.08E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.73E-03	1.19E-03	8.44E-04	6.47E-04	5.67E-04	1.26E-03	2.83E-03	6.42E-03	1.08E-02	9.57E-03	8.66E-03	8.03E-03	9.61E-03	8.70E-03	9.69E-03	1.06E-02	1.08E-02	1.25E-02	1.42E-02	1.23E-02	9.32E-03	7.03E-03	6.34E-03	5.38E-03
	Emission in each Box of 1st jet	g/s	2.16E-04	1.49E-04	1.06E-04	8.09E-05	7.08E-05	1.58E-04	3.54E-04	8.02E-04	1.34E-03	1.20E-03	1.08E-03	1.00E-03	1.20E-03	1.09E-03	1.21E-03	1.32E-03	1.35E-03	1.56E-03	1.78E-03	1.54E-03	1.17E-03	8.79E-04	7.92E-04	6.73E-04
	Emission in each Box of 2nd jet	g/s	1.15E-04	7.95E-05	5.63E-05	4.32E-05	3.78E-05	8.41E-05	1.89E-04	4.28E-04	7.17E-04	6.38E-04	5.78E-04	5.35E-04	6.41E-04	5.80E-04	6.46E-04	7.07E-04	7.22E-04	8.32E-04	9.49E-04	8.20E-04	6.22E-04	4.69E-04	4.22E-04	3.59E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0030***	***0.0059***	***0.0052***	***0.0047***	***0.0043***	***0.0057***	***0.0051***	***0.0058***	***0.0063***	***0.0064***	***0.0075***	***0.0086***	***0.0075***	***0.0055***	***0.0040***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.29E-04	5.01E-04	3.47E-04	2.61E-04	2.26E-04	3.28E-04	7.05E-04	1.98E-03	3.93E-03	3.48E-03	3.14E-03	2.88E-03	3.81E-03	3.43E-03	3.84E-03	4.21E-03	4.27E-03	4.97E-03	5.74E-03	5.00E-03	3.68E-03	2.69E-03	2.41E-03	2.07E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.15E-04	2.51E-04	1.73E-04	1.31E-04	1.13E-04	1.64E-04	3.52E-04	9.88E-04	1.96E-03	1.74E-03	1.57E-03	1.44E-03	1.91E-03	1.71E-03	1.92E-03	2.10E-03	2.13E-03	2.49E-03	2.87E-03	2.50E-03	1.84E-03	1.35E-03	1.20E-03	1.04E-03
	Emission in each Box of 1st jet	g/s	3.93E-05	3.13E-05	2.17E-05	1.63E-05	1.41E-05	2.05E-05	4.41E-05	1.24E-04	2.46E-04	2.18E-04	1.97E-04	1.80E-04	2.38E-04	2.14E-04	2.40E-04	2.63E-04	2.67E-04	3.11E-04	3.59E-04	3.12E-04	2.30E-04	1.68E-04	1.50E-04	1.29E-04
	Emission in each Box of 2nd jet	g/s	2.10E-05	1.67E-05	1.16E-05	8.71E-06	7.54E-06	1.09E-05	2.35E-05	6.59E-05	1.31E-04	1.16E-04	1.05E-04	9.60E-05	1.27E-04	1.14E-04	1.28E-04	1.40E-04	1.42E-04	1.66E-04	1.91E-04	1.67E-04	1.23E-04	8.98E-05	8.02E-05	6.90E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1951	0.1627	0.1665	0.1720	0.1753	0.3434	0.3569	0.3194	0.3538	0.3424	0.3437	0.3433	0.3223	0.3055	0.3224	0.3378	0.3185	0.3393	0.3588	0.3208	0.2891	0.2668	0.2571	0.2400
	NO2	g/vehicle/km	0.0356	0.0342	0.0343	0.0348	0.0351	0.0447	0.0446	0.0492	0.0648	0.0623	0.0623	0.0614	0.0639	0.0602	0.0640	0.0670	0.0628	0.0676	0.0725	0.0652	0.0572	0.0512	0.0489	0.0464
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0051***	***0.0035***	***0.0024***	***0.0019***	***0.0016***	***0.0037***	***0.0082***	***0.0184***	***0.0306***	***0.0287***	***0.0264***	***0.0253***	***0.0299***	***0.0265***	***0.0296***	***0.0327***	***0.0322***	***0.0370***	***0.0413***	***0.0355***	***0.0262***	***0.0198***	***0.0178***	***0.0147***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.38E-03	2.30E-03	1.62E-03	1.24E-03	1.07E-03	2.46E-03	5.43E-03	1.23E-02	2.04E-02	1.91E-02	1.76E-02	1.68E-02	1.99E-02	1.77E-02	1.98E-02	2.18E-02	2.15E-02	2.46E-02	2.75E-02	2.37E-02	1.75E-02	1.32E-02	1.19E-02	9.81E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.69E-03	1.15E-03	8.09E-04	6.20E-04	5.34E-04	1.23E-03	2.72E-03	6.13E-03	1.02E-02	9.57E-03	8.80E-03	8.42E-03	9.96E-03	8.83E-03	9.88E-03	1.09E-02	1.07E-02	1.23E-02	1.38E-02	1.18E-02	8.73E-03	6.59E-03	5.95E-03	4.91E-03
	Emission in each Box of 1st jet	g/s	2.11E-04	1.44E-04	1.01E-04	7.75E-05	6.68E-05	1.54E-04	3.40E-04	7.66E-04	1.27E-03	1.20E-03	1.10E-03	1.05E-03	1.24E-03	1.10E-03	1.23E-03	1.36E-03	1.34E-03	1.54E-03	1.72E-03	1.48E-03	1.09E-03	8.24E-04	7.43E-04	6.13E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	7.68E-05	5.40E-05	4.13E-05	3.56E-05	8.20E-05	1.81E-04	4.09E-04	6.79E-04	6.38E-04	5.87E-04	5.61E-04	6.64E-04	5.89E-04	6.59E-04	7.26E-04	7.15E-04	8.21E-04	9.18E-04	7.89E-04	5.82E-04	4.39E-04	3.97E-04	3.27E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0028***	***0.0056***	***0.0052***	***0.0048***	***0.0045***	***0.0059***	***0.0052***	***0.0059***	***0.0065***	***0.0064***	***0.0074***	***0.0083***	***0.0072***	***0.0052***	***0.0038***	***0.0034***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.16E-04	4.85E-04	3.33E-04	2.51E-04	2.14E-04	3.20E-04	6.79E-04	1.89E-03	3.74E-03	3.49E-03	3.19E-03	3.01E-03	3.95E-03	3.48E-03	3.92E-03	4.32E-03	4.23E-03	4.91E-03	5.57E-03	4.81E-03	3.46E-03	2.53E-03	2.26E-03	1.90E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.08E-04	2.42E-04	1.67E-04	1.25E-04	1.07E-04	1.60E-04	3.39E-04	9.45E-04	1.87E-03	1.74E-03	1.60E-03	1.51E-03	1.97E-03	1.74E-03	1.96E-03	2.16E-03	2.12E-03	2.46E-03	2.78E-03	2.40E-03	1.73E-03	1.27E-03	1.13E-03	9.48E-04
	Emission in each Box of 1st jet	g/s	3.85E-05	3.03E-05	2.08E-05	1.57E-05	1.34E-05	2.00E-05	4.24E-05	1.18E-04	2.33E-04	2.18E-04	1.99E-04	1.88E-04	2.47E-04	2.18E-04	2.45E-04	2.70E-04	2.65E-04	3.07E-04	3.48E-04	3.00E-04	2.16E-04	1.58E-04	1.42E-04	1.19E-04
	Emission in each Box of 2nd jet	g/s	2.05E-05	1.62E-05	1.11E-05	8.36E-06	7.14E-06	1.07E-05	2.26E-05	6.30E-05	1.25E-04	1.16E-04	1.06E-04	1.00E-04	1.32E-04	1.16E-04	1.31E-04	1.44E-04	1.41E-04	1.64E-04	1.86E-04	1.60E-04	1.15E-04	8.44E-05	7.55E-05	6.32E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2062	0.1672	0.1722	0.1811	0.1858	0.3509	0.3700	0.3180	0.3572	0.3357	0.3361	0.3289	0.3135	0.3050	0.3228	0.3334	0.3395	0.3551	0.3788	0.3391	0.3028	0.2709	0.2666	0.2523
	NO2	g/vehicle/km	0.0375	0.0351	0.0354	0.0365	0.0371	0.0456	0.0461	0.0490	0.0654	0.0612	0.0610	0.0589	0.0622	0.0601	0.0640	0.0662	0.0668	0.0706	0.0763	0.0687	0.0598	0.0520	0.0506	0.0486
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0054***	***0.0036***	***0.0025***	***0.0020***	***0.0017***	***0.0038***	***0.0085***	***0.0183***	***0.0309***	***0.0282***	***0.0258***	***0.0242***	***0.0291***	***0.0265***	***0.0297***	***0.0322***	***0.0343***	***0.0387***	***0.0436***	***0.0375***	***0.0274***	***0.0201***	***0.0185***	***0.0155***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.57E-03	2.37E-03	1.67E-03	1.31E-03	1.13E-03	2.51E-03	5.63E-03	1.22E-02	2.06E-02	1.88E-02	1.72E-02	1.61E-02	1.94E-02	1.76E-02	1.98E-02	2.15E-02	2.29E-02	2.58E-02	2.91E-02	2.50E-02	1.83E-02	1.34E-02	1.23E-02	1.03E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.78E-03	1.18E-03	8.37E-04	6.53E-04	5.67E-04	1.26E-03	2.82E-03	6.10E-03	1.03E-02	9.38E-03	8.61E-03	8.06E-03	9.69E-03	8.82E-03	9.89E-03	1.07E-02	1.14E-02	1.29E-02	1.45E-02	1.25E-02	9.14E-03	6.69E-03	6.17E-03	5.16E-03
	Emission in each Box of 1st jet	g/s	2.23E-04	1.48E-04	1.05E-04	8.16E-05	7.08E-05	1.57E-04	3.52E-04	7.63E-04	1.29E-03	1.17E-03	1.08E-03	1.01E-03	1.21E-03	1.10E-03	1.24E-03	1.34E-03	1.43E-03	1.61E-03	1.82E-03	1.56E-03	1.14E-03	8.36E-04	7.71E-04	6.45E-04
	Emission in each Box of 2nd jet	g/s	1.19E-04	7.89E-05	5.58E-05	4.35E-05	3.78E-05	8.38E-05	1.88E-04	4.07E-04	6.86E-04	6.26E-04	5.74E-04	5.38E-04	6.46E-04	5.88E-04	6.59E-04	7.16E-04	7.63E-04	8.60E-04	9.69E-04	8.34E-04	6.09E-04	4.46E-04	4.11E-04	3.44E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0028***	***0.0057***	***0.0051***	***0.0047***	***0.0043***	***0.0058***	***0.0052***	***0.0059***	***0.0064***	***0.0068***	***0.0077***	***0.0088***	***0.0076***	***0.0054***	***0.0039***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.50E-04	4.97E-04	3.44E-04	2.63E-04	2.26E-04	3.26E-04	7.02E-04	1.88E-03	3.77E-03	3.42E-03	3.12E-03	2.89E-03	3.84E-03	3.48E-03	3.92E-03	4.27E-03	4.50E-03	5.13E-03	5.86E-03	5.07E-03	3.61E-03	2.57E-03	2.34E-03	1.99E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.25E-04	2.48E-04	1.72E-04	1.32E-04	1.13E-04	1.63E-04	3.51E-04	9.40E-04	1.88E-03	1.71E-03	1.56E-03	1.45E-03	1.92E-03	1.74E-03	1.96E-03	2.13E-03	2.25E-03	2.56E-03	2.93E-03	2.54E-03	1.81E-03	1.28E-03	1.17E-03	9.94E-04
	Emission in each Box of 1st jet	g/s	4.06E-05	3.10E-05	2.15E-05	1.65E-05	1.41E-05	2.04E-05	4.39E-05	1.18E-04	2.36E-04	2.14E-04	1.95E-04	1.81E-04	2.40E-04	2.17E-04	2.45E-04	2.67E-04	2.81E-04	3.20E-04	3.66E-04	3.17E-04	2.26E-04	1.60E-04	1.46E-04	1.24E-04
	Emission in each Box of 2nd jet	g/s	2.17E-05	1.66E-05	1.15E-05	8.78E-06	7.54E-06	1.09E-05	2.34E-05	6.27E-05	1.26E-04	1.14E-04	1.04E-04	9.63E-05	1.28E-04	1.16E-04	1.31E-04	1.42E-04	1.50E-04	1.71E-04	1.95E-04	1.69E-04	1.20E-04	8.56E-05	7.81E-05	6.63E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2048	0.1708	0.1698	0.1736	0.1849	0.3418	0.3620	0.3127	0.3422	0.3210	0.3332	0.3142	0.3083	0.2965	0.3206	0.3164	0.3060	0.3365	0.3619	0.3241	0.3025	0.2734	0.2658	0.2495
	NO2	g/vehicle/km	0.0373	0.0358	0.0349	0.0351	0.0369	0.0445	0.0452	0.0482	0.0627	0.0585	0.0605	0.0564	0.0612	0.0585	0.0636	0.0629	0.0605	0.0670	0.0731	0.0658	0.0598	0.0524	0.0505	0.0481
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0053***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0037***	***0.0083***	***0.0180***	***0.0296***	***0.0269***	***0.0256***	***0.0231***	***0.0286***	***0.0257***	***0.0295***	***0.0306***	***0.0309***	***0.0367***	***0.0417***	***0.0359***	***0.0274***	***0.0203***	***0.0185***	***0.0153***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.54E-03	2.42E-03	1.65E-03	1.25E-03	1.13E-03	2.45E-03	5.51E-03	1.20E-02	1.97E-02	1.79E-02	1.71E-02	1.54E-02	1.91E-02	1.71E-02	1.96E-02	2.04E-02	2.06E-02	2.44E-02	2.78E-02	2.39E-02	1.83E-02	1.35E-02	1.23E-02	1.02E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.77E-03	1.21E-03	8.26E-04	6.26E-04	5.64E-04	1.22E-03	2.76E-03	6.00E-03	9.86E-03	8.97E-03	8.53E-03	7.70E-03	9.53E-03	8.57E-03	9.82E-03	1.02E-02	1.03E-02	1.22E-02	1.39E-02	1.20E-02	9.13E-03	6.75E-03	6.15E-03	5.10E-03
	Emission in each Box of 1st jet	g/s	2.22E-04	1.51E-04	1.03E-04	7.82E-05	7.05E-05	1.53E-04	3.44E-04	7.50E-04	1.23E-03	1.12E-03	1.07E-03	9.63E-04	1.19E-03	1.07E-03	1.23E-03	1.27E-03	1.29E-03	1.53E-03	1.74E-03	1.49E-03	1.14E-03	8.44E-04	7.69E-04	6.38E-04
	Emission in each Box of 2nd jet	g/s	1.18E-04	8.06E-05	5.50E-05	4.17E-05	3.76E-05	8.16E-05	1.84E-04	4.00E-04	6.57E-04	5.98E-04	5.69E-04	5.14E-04	6.35E-04	5.72E-04	6.55E-04	6.80E-04	6.87E-04	8.15E-04	9.26E-04	7.97E-04	6.09E-04	4.50E-04	4.10E-04	3.40E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0028***	***0.0054***	***0.0049***	***0.0046***	***0.0041***	***0.0057***	***0.0051***	***0.0058***	***0.0061***	***0.0061***	***0.0073***	***0.0084***	***0.0073***	***0.0054***	***0.0039***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.45E-04	5.07E-04	3.40E-04	2.53E-04	2.25E-04	3.19E-04	6.88E-04	1.85E-03	3.61E-03	3.27E-03	3.10E-03	2.77E-03	3.78E-03	3.38E-03	3.90E-03	4.05E-03	4.08E-03	4.87E-03	5.61E-03	4.86E-03	3.61E-03	2.59E-03	2.34E-03	1.97E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.23E-04	2.54E-04	1.70E-04	1.27E-04	1.12E-04	1.59E-04	3.44E-04	9.26E-04	1.81E-03	1.64E-03	1.55E-03	1.38E-03	1.89E-03	1.69E-03	1.95E-03	2.03E-03	2.04E-03	2.43E-03	2.81E-03	2.43E-03	1.80E-03	1.29E-03	1.17E-03	9.84E-04
	Emission in each Box of 1st jet	g/s	4.03E-05	3.17E-05	2.12E-05	1.58E-05	1.41E-05	1.99E-05	4.30E-05	1.16E-04	2.26E-04	2.05E-04	1.94E-04	1.73E-04	2.36E-04	2.11E-04	2.43E-04	2.53E-04	2.55E-04	3.04E-04	3.51E-04	3.03E-04	2.26E-04	1.62E-04	1.46E-04	1.23E-04
	Emission in each Box of 2nd jet	g/s	2.15E-05	1.69E-05	1.13E-05	8.44E-06	7.50E-06	1.06E-05	2.29E-05	6.17E-05	1.20E-04	1.09E-04	1.03E-04	9.22E-05	1.26E-04	1.13E-04	1.30E-04	1.35E-04	1.36E-04	1.62E-04	1.87E-04	1.62E-04	1.20E-04	8.63E-05	7.79E-05	6.56E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2331	0.1970	0.1972	0.2050	0.2137	0.4114	0.4316	0.3731	0.4067	0.3773	0.3722	0.3674	0.3514	0.3308	0.3451	0.3632	0.3523	0.3770	0.4051	0.3657	0.3393	0.3070	0.3012	0.2878
	NO2	g/vehicle/km	0.0419	0.0407	0.0399	0.0408	0.0419	0.0529	0.0533	0.0569	0.0738	0.0682	0.0671	0.0654	0.0693	0.0649	0.0681	0.0717	0.0692	0.0747	0.0813	0.0738	0.0666	0.0585	0.0568	0.0550
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0061***	***0.0042***	***0.0029***	***0.0022***	***0.0020***	***0.0044***	***0.0099***	***0.0215***	***0.0351***	***0.0316***	***0.0286***	***0.0270***	***0.0326***	***0.0287***	***0.0317***	***0.0351***	***0.0356***	***0.0411***	***0.0466***	***0.0405***	***0.0307***	***0.0227***	***0.0209***	***0.0177***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.04E-03	2.79E-03	1.92E-03	1.48E-03	1.30E-03	2.95E-03	6.57E-03	1.43E-02	2.34E-02	2.11E-02	1.91E-02	1.80E-02	2.17E-02	1.91E-02	2.11E-02	2.34E-02	2.37E-02	2.74E-02	3.11E-02	2.70E-02	2.05E-02	1.52E-02	1.39E-02	1.18E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.02E-03	1.39E-03	9.59E-04	7.39E-04	6.52E-04	1.47E-03	3.29E-03	7.16E-03	1.17E-02	1.05E-02	9.53E-03	9.01E-03	1.09E-02	9.56E-03	1.06E-02	1.17E-02	1.19E-02	1.37E-02	1.55E-02	1.35E-02	1.02E-02	7.58E-03	6.97E-03	5.89E-03
	Emission in each Box of 1st jet	g/s	2.52E-04	1.74E-04	1.20E-04	9.24E-05	8.15E-05	1.84E-04	4.11E-04	8.95E-04	1.46E-03	1.32E-03	1.19E-03	1.13E-03	1.36E-03	1.20E-03	1.32E-03	1.46E-03	1.48E-03	1.71E-03	1.94E-03	1.69E-03	1.28E-03	9.47E-04	8.71E-04	7.36E-04
	Emission in each Box of 2nd jet	g/s	1.35E-04	9.30E-05	6.39E-05	4.93E-05	4.34E-05	9.82E-05	2.19E-04	4.77E-04	7.81E-04	7.03E-04	6.35E-04	6.01E-04	7.24E-04	6.38E-04	7.05E-04	7.81E-04	7.91E-04	9.13E-04	1.04E-03	8.99E-04	6.83E-04	5.05E-04	4.65E-04	3.92E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0033***	***0.0064***	***0.0057***	***0.0052***	***0.0048***	***0.0064***	***0.0056***	***0.0063***	***0.0069***	***0.0070***	***0.0081***	***0.0094***	***0.0082***	***0.0060***	***0.0043***	***0.0039***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.26E-04	5.76E-04	3.88E-04	2.94E-04	2.56E-04	3.79E-04	8.11E-04	2.19E-03	4.25E-03	3.81E-03	3.44E-03	3.21E-03	4.28E-03	3.75E-03	4.18E-03	4.62E-03	4.66E-03	5.42E-03	6.24E-03	5.44E-03	4.02E-03	2.89E-03	2.63E-03	2.25E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.63E-04	2.88E-04	1.94E-04	1.47E-04	1.28E-04	1.89E-04	4.06E-04	1.09E-03	2.13E-03	1.91E-03	1.72E-03	1.60E-03	2.14E-03	1.88E-03	2.09E-03	2.31E-03	2.33E-03	2.71E-03	3.12E-03	2.72E-03	2.01E-03	1.44E-03	1.31E-03	1.12E-03
	Emission in each Box of 1st jet	g/s	4.54E-05	3.60E-05	2.43E-05	1.84E-05	1.60E-05	2.37E-05	5.07E-05	1.37E-04	2.66E-04	2.38E-04	2.15E-04	2.01E-04	2.68E-04	2.34E-04	2.61E-04	2.89E-04	2.91E-04	3.39E-04	3.90E-04	3.40E-04	2.51E-04	1.80E-04	1.64E-04	1.41E-04
	Emission in each Box of 2nd jet	g/s	2.42E-05	1.92E-05	1.29E-05	9.80E-06	8.52E-06	1.26E-05	2.70E-05	7.28E-05	1.42E-04	1.27E-04	1.15E-04	1.07E-04	1.43E-04	1.25E-04	1.39E-04	1.54E-04	1.55E-04	1.81E-04	2.08E-04	1.81E-04	1.34E-04	9.63E-05	8.76E-05	7.50E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2549	0.2115	0.2147	0.2246	0.2335	0.4450	0.4716	0.4033	0.4394	0.4064	0.4021	0.3912	0.3761	0.3574	0.3745	0.3878	0.3774	0.4013	0.4312	0.3959	0.3632	0.3347	0.3267	0.3104
	NO2	g/vehicle/km	0.0455	0.0434	0.0431	0.0442	0.0454	0.0570	0.0580	0.0613	0.0793	0.0731	0.0720	0.0693	0.0737	0.0696	0.0735	0.0762	0.0737	0.0791	0.0862	0.0795	0.0709	0.0633	0.0612	0.0589
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0066***	***0.0045***	***0.0031***	***0.0024***	***0.0021***	***0.0048***	***0.0108***	***0.0232***	***0.0380***	***0.0341***	***0.0309***	***0.0288***	***0.0349***	***0.0310***	***0.0344***	***0.0375***	***0.0381***	***0.0437***	***0.0496***	***0.0438***	***0.0329***	***0.0248***	***0.0227***	***0.0190***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.41E-03	2.99E-03	2.09E-03	1.62E-03	1.42E-03	3.19E-03	7.18E-03	1.55E-02	2.53E-02	2.27E-02	2.06E-02	1.92E-02	2.32E-02	2.07E-02	2.29E-02	2.50E-02	2.54E-02	2.91E-02	3.31E-02	2.92E-02	2.19E-02	1.65E-02	1.51E-02	1.27E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.21E-03	1.50E-03	1.04E-03	8.09E-04	7.12E-04	1.59E-03	3.59E-03	7.74E-03	1.27E-02	1.14E-02	1.03E-02	9.59E-03	1.16E-02	1.03E-02	1.15E-02	1.25E-02	1.27E-02	1.46E-02	1.65E-02	1.46E-02	1.10E-02	8.26E-03	7.56E-03	6.35E-03
	Emission in each Box of 1st jet	g/s	2.76E-04	1.87E-04	1.30E-04	1.01E-04	8.90E-05	1.99E-04	4.49E-04	9.67E-04	1.58E-03	1.42E-03	1.29E-03	1.20E-03	1.45E-03	1.29E-03	1.43E-03	1.56E-03	1.59E-03	1.82E-03	2.07E-03	1.83E-03	1.37E-03	1.03E-03	9.45E-04	7.93E-04
	Emission in each Box of 2nd jet	g/s	1.47E-04	9.98E-05	6.96E-05	5.40E-05	4.75E-05	1.06E-04	2.39E-04	5.16E-04	8.44E-04	7.57E-04	6.86E-04	6.39E-04	7.75E-04	6.89E-04	7.65E-04	8.33E-04	8.48E-04	9.71E-04	1.10E-03	9.73E-04	7.31E-04	5.51E-04	5.04E-04	4.23E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0035***	***0.0069***	***0.0061***	***0.0055***	***0.0051***	***0.0068***	***0.0060***	***0.0068***	***0.0074***	***0.0074***	***0.0086***	***0.0099***	***0.0088***	***0.0064***	***0.0047***	***0.0042***	***0.0036***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.88E-04	6.15E-04	4.19E-04	3.19E-04	2.77E-04	4.08E-04	8.82E-04	2.35E-03	4.57E-03	4.08E-03	3.69E-03	3.40E-03	4.55E-03	4.02E-03	4.50E-03	4.91E-03	4.96E-03	5.74E-03	6.62E-03	5.86E-03	4.28E-03	3.13E-03	2.83E-03	2.41E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.94E-04	3.07E-04	2.09E-04	1.59E-04	1.38E-04	2.04E-04	4.41E-04	1.18E-03	2.28E-03	2.04E-03	1.84E-03	1.70E-03	2.28E-03	2.01E-03	2.25E-03	2.46E-03	2.48E-03	2.87E-03	3.31E-03	2.93E-03	2.14E-03	1.56E-03	1.42E-03	1.21E-03
	Emission in each Box of 1st jet	g/s	4.93E-05	3.84E-05	2.62E-05	1.99E-05	1.73E-05	2.55E-05	5.51E-05	1.47E-04	2.86E-04	2.55E-04	2.31E-04	2.12E-04	2.85E-04	2.51E-04	2.81E-04	3.07E-04	3.10E-04	3.59E-04	4.14E-04	3.66E-04	2.68E-04	1.96E-04	1.77E-04	1.51E-04
	Emission in each Box of 2nd jet	g/s	2.63E-05	2.05E-05	1.40E-05	1.06E-05	9.23E-06	1.36E-05	2.94E-05	7.85E-05	1.52E-04	1.36E-04	1.23E-04	1.13E-04	1.52E-04	1.34E-04	1.50E-04	1.64E-04	1.65E-04	1.91E-04	2.21E-04	1.95E-04	1.43E-04	1.04E-04	9.44E-05	8.04E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																								
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2648	0.2212	0.2246	0.2353	0.2435	0.4586	0.4859	0.4178	0.4523	0.4179	0.4134	0.4050	0.3872	0.3662	0.3840	0.3984	0.3903	0.4190	0.4449	0.4081	0.3752	0.3457	0.3379	0.3223
	NO2	g/vehicle/km	0.0469	0.0449	0.0445	0.0457	0.0468	0.0584	0.0594	0.0631	0.0812	0.0747	0.0736	0.0713	0.0754	0.0710	0.0750	0.0779	0.0758	0.0821	0.0884	0.0815	0.0728	0.0650	0.0629	0.0608
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0069***	***0.0047***	***0.0033***	***0.0025***	***0.0022***	***0.0049***	***0.0111***	***0.0241***	***0.0391***	***0.0350***	***0.0318***	***0.0298***	***0.0359***	***0.0318***	***0.0353***	***0.0385***	***0.0394***	***0.0456***	***0.0512***	***0.0452***	***0.0340***	***0.0256***	***0.0235***	***0.0198***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.58E-03	3.13E-03	2.18E-03	1.70E-03	1.48E-03	3.29E-03	7.40E-03	1.60E-02	2.61E-02	2.34E-02	2.12E-02	1.99E-02	2.39E-02	2.12E-02	2.35E-02	2.57E-02	2.63E-02	3.04E-02	3.42E-02	3.01E-02	2.27E-02	1.71E-02	1.56E-02	1.32E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.29E-03	1.57E-03	1.09E-03	8.48E-04	7.42E-04	1.64E-03	3.70E-03	8.02E-03	1.30E-02	1.17E-02	1.06E-02	9.93E-03	1.20E-02	1.06E-02	1.18E-02	1.28E-02	1.31E-02	1.52E-02	1.71E-02	1.51E-02	1.13E-02	8.53E-03	7.82E-03	6.59E-03
	Emission in each Box of 1st jet	g/s	2.87E-04	1.96E-04	1.36E-04	1.06E-04	9.28E-05	2.05E-04	4.62E-04	1.00E-03	1.63E-03	1.46E-03	1.32E-03	1.24E-03	1.50E-03	1.32E-03	1.47E-03	1.61E-03	1.64E-03	1.90E-03	2.13E-03	1.88E-03	1.42E-03	1.07E-03	9.77E-04	8.24E-04
	Emission in each Box of 2nd jet	g/s	1.53E-04	1.04E-04	7.28E-05	5.65E-05	4.95E-05	1.10E-04	2.47E-04	5.35E-04	8.69E-04	7.79E-04	7.06E-04	6.62E-04	7.97E-04	7.06E-04	7.84E-04	8.56E-04	8.77E-04	1.01E-03	1.14E-03	1.00E-03	7.55E-04	5.69E-04	5.21E-04	4.39E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0010***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0014***	***0.0036***	***0.0070***	***0.0063***	***0.0057***	***0.0052***	***0.0070***	***0.0062***	***0.0069***	***0.0075***	***0.0077***	***0.0089***	***0.0102***	***0.0090***	***0.0066***	***0.0048***	***0.0044***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.13E-04	6.35E-04	4.32E-04	3.30E-04	2.85E-04	4.18E-04	9.04E-04	2.42E-03	4.68E-03	4.18E-03	3.77E-03	3.49E-03	4.66E-03	4.11E-03	4.60E-03	5.03E-03	5.11E-03	5.96E-03	6.79E-03	6.01E-03	4.40E-03	3.21E-03	2.91E-03	2.49E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.06E-04	3.18E-04	2.16E-04	1.65E-04	1.43E-04	2.09E-04	4.52E-04	1.21E-03	2.34E-03	2.09E-03	1.89E-03	1.75E-03	2.33E-03	2.05E-03	2.30E-03	2.51E-03	2.55E-03	2.98E-03	3.39E-03	3.00E-03	2.20E-03	1.61E-03	1.46E-03	1.24E-03
	Emission in each Box of 1st jet	g/s	5.08E-05	3.97E-05	2.70E-05	2.06E-05	1.78E-05	2.61E-05	5.65E-05	1.51E-04	2.92E-04	2.61E-04	2.36E-04	2.18E-04	2.91E-04	2.57E-04	2.87E-04	3.14E-04	3.19E-04	3.73E-04	4.24E-04	3.76E-04	2.75E-04	2.01E-04	1.82E-04	1.55E-04
	Emission in each Box of 2nd jet	g/s	2.71E-05	2.12E-05	1.44E-05	1.10E-05	9.51E-06	1.39E-05	3.01E-05	8.07E-05	1.56E-04	1.39E-04	1.26E-04	1.16E-04	1.55E-04	1.37E-04	1.53E-04	1.68E-04	1.70E-04	1.99E-04	2.26E-04	2.00E-04	1.47E-04	1.07E-04	9.70E-05	8.29E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2677	0.2254	0.2279	0.2394	0.2471	0.4642	0.4907	0.4240	0.4575	0.4225	0.4158	0.4101	0.3907	0.3711	0.3894	0.4041	0.4000	0.4278	0.4544	0.4155	0.3831	0.3530	0.3417	0.3239
	NO2	g/vehicle/km	0.0473	0.0455	0.0450	0.0463	0.0473	0.0589	0.0599	0.0638	0.0819	0.0753	0.0739	0.0720	0.0759	0.0717	0.0757	0.0787	0.0774	0.0835	0.0900	0.0826	0.0741	0.0662	0.0634	0.0610
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0082***	***0.0055***	***0.0039***	***0.0030***	***0.0027***	***0.0067***	***0.0153***	***0.0301***	***0.0468***	***0.0419***	***0.0381***	***0.0360***	***0.0235***	***0.0209***	***0.0232***	***0.0253***	***0.0259***	***0.0299***	***0.0335***	***0.0293***	***0.0223***	***0.0170***	***0.0154***	***0.0127***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.46E-03	3.66E-03	2.58E-03	2.03E-03	1.77E-03	4.49E-03	1.02E-02	2.00E-02	3.12E-02	2.79E-02	2.54E-02	2.40E-02	1.56E-02	1.39E-02	1.55E-02	1.68E-02	1.73E-02	1.99E-02	2.23E-02	1.95E-02	1.49E-02	1.14E-02	1.03E-02	8.47E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.73E-03	1.83E-03	1.29E-03	1.02E-03	8.85E-04	2.25E-03	5.12E-03	1.00E-02	1.56E-02	1.40E-02	1.27E-02	1.20E-02	7.82E-03	6.96E-03	7.73E-03	8.42E-03	8.63E-03	9.95E-03	1.12E-02	9.75E-03	7.44E-03	5.68E-03	5.13E-03	4.23E-03
	Emission in each Box of 1st jet	g/s	7.80E-04	5.23E-04	3.69E-04	2.90E-04	2.53E-04	6.42E-04	1.46E-03	2.86E-03	4.46E-03	3.99E-03	3.62E-03	3.43E-03	2.23E-03	1.99E-03	2.21E-03	2.41E-03	2.47E-03	2.84E-03	3.19E-03	2.79E-03	2.13E-03	1.62E-03	1.47E-03	1.21E-03
	Emission in each Box of 2nd jet	g/s	4.55E-04	3.05E-04	2.15E-04	1.69E-04	1.48E-04	3.74E-04	8.53E-04	1.67E-03	2.60E-03	2.33E-03	2.11E-03	2.00E-03	1.30E-03	1.16E-03	1.29E-03	1.40E-03	1.44E-03	1.66E-03	1.86E-03	1.63E-03	1.24E-03	9.47E-04	8.55E-04	7.06E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0019***	***0.0045***	***0.0084***	***0.0075***	***0.0068***	***0.0063***	***0.0046***	***0.0040***	***0.0045***	***0.0049***	***0.0050***	***0.0058***	***0.0066***	***0.0058***	***0.0043***	***0.0032***	***0.0029***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.64E-04	7.39E-04	5.10E-04	3.93E-04	3.39E-04	5.70E-04	1.25E-03	3.02E-03	5.59E-03	4.98E-03	4.51E-03	4.22E-03	3.04E-03	2.69E-03	3.01E-03	3.28E-03	3.34E-03	3.89E-03	4.42E-03	3.88E-03	2.88E-03	2.13E-03	1.90E-03	1.59E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.82E-04	3.70E-04	2.55E-04	1.96E-04	1.69E-04	2.85E-04	6.24E-04	1.51E-03	2.80E-03	2.49E-03	2.26E-03	2.11E-03	1.52E-03	1.34E-03	1.50E-03	1.64E-03	1.67E-03	1.94E-03	2.21E-03	1.94E-03	1.44E-03	1.06E-03	9.52E-04	7.97E-04
	Emission in each Box of 1st jet	g/s	1.38E-04	1.06E-04	7.29E-05	5.61E-05	4.84E-05	8.15E-05	1.78E-04	4.31E-04	7.99E-04	7.11E-04	6.45E-04	6.03E-04	4.34E-04	3.84E-04	4.29E-04	4.69E-04	4.77E-04	5.55E-04	6.31E-04	5.54E-04	4.11E-04	3.04E-04	2.72E-04	2.28E-04
	Emission in each Box of 2nd jet	g/s	8.03E-05	6.16E-05	4.25E-05	3.27E-05	2.82E-05	4.75E-05	1.04E-04	2.51E-04	4.66E-04	4.15E-04	3.76E-04	3.52E-04	2.53E-04	2.24E-04	2.51E-04	2.73E-04	2.78E-04	3.24E-04	3.68E-04	3.23E-04	2.40E-04	1.77E-04	1.59E-04	1.33E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2446	0.2050	0.2064	0.2178	0.2313	0.4405	0.4677	0.4007	0.4333	0.4049	0.3999	0.3925	0.3728	0.3498	0.3695	0.3847	0.3805	0.4021	0.4173	0.3810	0.3495	0.3227	0.3125	0.2959
	NO2	g/vehicle/km	0.0438	0.0420	0.0414	0.0429	0.0449	0.0564	0.0574	0.0609	0.0783	0.0727	0.0716	0.0694	0.0730	0.0682	0.0725	0.0756	0.0742	0.0792	0.0835	0.0765	0.0683	0.0611	0.0587	0.0563
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0075***	***0.0050***	***0.0035***	***0.0028***	***0.0025***	***0.0064***	***0.0146***	***0.0284***	***0.0443***	***0.0401***	***0.0366***	***0.0345***	***0.0224***	***0.0197***	***0.0220***	***0.0240***	***0.0246***	***0.0281***	***0.0307***	***0.0268***	***0.0204***	***0.0156***	***0.0141***	***0.0116***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.99E-03	3.33E-03	2.34E-03	1.85E-03	1.66E-03	4.26E-03	9.75E-03	1.89E-02	2.96E-02	2.68E-02	2.44E-02	2.30E-02	1.49E-02	1.31E-02	1.47E-02	1.60E-02	1.64E-02	1.87E-02	2.05E-02	1.79E-02	1.36E-02	1.04E-02	9.38E-03	7.73E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.49E-03	1.67E-03	1.17E-03	9.24E-04	8.28E-04	2.13E-03	4.88E-03	9.47E-03	1.48E-02	1.34E-02	1.22E-02	1.15E-02	7.46E-03	6.56E-03	7.34E-03	8.01E-03	8.21E-03	9.35E-03	1.02E-02	8.94E-03	6.79E-03	5.20E-03	4.69E-03	3.87E-03
	Emission in each Box of 1st jet	g/s	7.12E-04	4.76E-04	3.34E-04	2.64E-04	2.37E-04	6.09E-04	1.39E-03	2.70E-03	4.22E-03	3.82E-03	3.49E-03	3.29E-03	2.13E-03	1.87E-03	2.10E-03	2.29E-03	2.35E-03	2.67E-03	2.93E-03	2.56E-03	1.94E-03	1.48E-03	1.34E-03	1.10E-03
	Emission in each Box of 2nd jet	g/s	4.15E-04	2.78E-04	1.95E-04	1.54E-04	1.38E-04	3.55E-04	8.13E-04	1.58E-03	2.46E-03	2.23E-03	2.03E-03	1.92E-03	1.24E-03	1.09E-03	1.22E-03	1.34E-03	1.37E-03	1.56E-03	1.71E-03	1.49E-03	1.13E-03	8.66E-04	7.82E-04	6.45E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0043***	***0.0080***	***0.0072***	***0.0066***	***0.0061***	***0.0044***	***0.0038***	***0.0043***	***0.0047***	***0.0048***	***0.0055***	***0.0061***	***0.0054***	***0.0040***	***0.0030***	***0.0026***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.92E-04	6.83E-04	4.70E-04	3.64E-04	3.22E-04	5.46E-04	1.20E-03	2.88E-03	5.34E-03	4.81E-03	4.37E-03	4.07E-03	2.92E-03	2.56E-03	2.88E-03	3.15E-03	3.20E-03	3.68E-03	4.10E-03	3.59E-03	2.65E-03	1.97E-03	1.76E-03	1.47E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.46E-04	3.41E-04	2.35E-04	1.82E-04	1.61E-04	2.73E-04	5.99E-04	1.44E-03	2.67E-03	2.40E-03	2.18E-03	2.03E-03	1.46E-03	1.28E-03	1.44E-03	1.57E-03	1.60E-03	1.84E-03	2.05E-03	1.80E-03	1.33E-03	9.84E-04	8.81E-04	7.36E-04
	Emission in each Box of 1st jet	g/s	1.27E-04	9.75E-05	6.71E-05	5.20E-05	4.60E-05	7.80E-05	1.71E-04	4.11E-04	7.63E-04	6.87E-04	6.24E-04	5.81E-04	4.18E-04	3.65E-04	4.11E-04	4.50E-04	4.57E-04	5.26E-04	5.85E-04	5.13E-04	3.79E-04	2.81E-04	2.52E-04	2.10E-04
	Emission in each Box of 2nd jet	g/s	7.44E-05	5.69E-05	3.92E-05	3.03E-05	2.68E-05	4.55E-05	9.98E-05	2.40E-04	4.45E-04	4.01E-04	3.64E-04	3.39E-04	2.44E-04	2.13E-04	2.40E-04	2.62E-04	2.67E-04	3.07E-04	3.42E-04	2.99E-04	2.21E-04	1.64E-04	1.47E-04	1.23E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2469	0.2048	0.2065	0.2183	0.2271	0.4299	0.4531	0.3946	0.4255	0.3933	0.3797	0.3736	0.3545	0.3369	0.3533	0.3681	0.3657	0.3903	0.4153	0.3815	0.3540	0.3236	0.3185	0.3026
	NO2	g/vehicle/km	0.0442	0.0421	0.0416	0.0430	0.0442	0.0551	0.0558	0.0600	0.0770	0.0708	0.0683	0.0664	0.0698	0.0659	0.0696	0.0726	0.0716	0.0771	0.0832	0.0767	0.0692	0.0614	0.0598	0.0576
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0075***	***0.0050***	***0.0035***	***0.0028***	***0.0024***	***0.0062***	***0.0142***	***0.0280***	***0.0435***	***0.0390***	***0.0348***	***0.0328***	***0.0213***	***0.0189***	***0.0210***	***0.0230***	***0.0237***	***0.0272***	***0.0306***	***0.0269***	***0.0206***	***0.0156***	***0.0143***	***0.0119***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.03E-03	3.33E-03	2.34E-03	1.85E-03	1.63E-03	4.16E-03	9.45E-03	1.86E-02	2.90E-02	2.60E-02	2.32E-02	2.19E-02	1.42E-02	1.26E-02	1.40E-02	1.53E-02	1.58E-02	1.82E-02	2.04E-02	1.79E-02	1.38E-02	1.04E-02	9.56E-03	7.91E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.52E-03	1.66E-03	1.17E-03	9.26E-04	8.13E-04	2.08E-03	4.72E-03	9.32E-03	1.45E-02	1.30E-02	1.16E-02	1.09E-02	7.10E-03	6.31E-03	7.01E-03	7.67E-03	7.89E-03	9.08E-03	1.02E-02	8.96E-03	6.88E-03	5.21E-03	4.78E-03	3.96E-03
	Emission in each Box of 1st jet	g/s	7.19E-04	4.75E-04	3.35E-04	2.65E-04	2.32E-04	5.95E-04	1.35E-03	2.66E-03	4.15E-03	3.71E-03	3.31E-03	3.13E-03	2.03E-03	1.80E-03	2.00E-03	2.19E-03	2.25E-03	2.59E-03	2.91E-03	2.56E-03	1.96E-03	1.49E-03	1.37E-03	1.13E-03
	Emission in each Box of 2nd jet	g/s	4.19E-04	2.77E-04	1.95E-04	1.54E-04	1.36E-04	3.47E-04	7.87E-04	1.55E-03	2.42E-03	2.17E-03	1.93E-03	1.82E-03	1.18E-03	1.05E-03	1.17E-03	1.28E-03	1.32E-03	1.51E-03	1.70E-03	1.49E-03	1.15E-03	8.68E-04	7.97E-04	6.59E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0017***	***0.0043***	***0.0079***	***0.0070***	***0.0063***	***0.0058***	***0.0042***	***0.0037***	***0.0041***	***0.0045***	***0.0046***	***0.0054***	***0.0061***	***0.0054***	***0.0040***	***0.0030***	***0.0027***	***0.0023***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.01E-04	6.84E-04	4.71E-04	3.65E-04	3.17E-04	5.33E-04	1.16E-03	2.83E-03	5.25E-03	4.68E-03	4.17E-03	3.89E-03	2.79E-03	2.47E-03	2.76E-03	3.02E-03	3.09E-03	3.59E-03	4.08E-03	3.60E-03	2.69E-03	1.98E-03	1.79E-03	1.51E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.51E-04	3.42E-04	2.36E-04	1.83E-04	1.58E-04	2.67E-04	5.81E-04	1.42E-03	2.63E-03	2.34E-03	2.08E-03	1.95E-03	1.40E-03	1.24E-03	1.38E-03	1.51E-03	1.54E-03	1.79E-03	2.04E-03	1.80E-03	1.34E-03	9.88E-04	8.97E-04	7.53E-04
	Emission in each Box of 1st jet	g/s	1.29E-04	9.77E-05	6.73E-05	5.22E-05	4.52E-05	7.62E-05	1.66E-04	4.05E-04	7.50E-04	6.69E-04	5.95E-04	5.56E-04	3.99E-04	3.53E-04	3.95E-04	4.32E-04	4.41E-04	5.13E-04	5.83E-04	5.14E-04	3.84E-04	2.82E-04	2.56E-04	2.15E-04
	Emission in each Box of 2nd jet	g/s	7.51E-05	5.70E-05	3.93E-05	3.04E-05	2.64E-05	4.44E-05	9.69E-05	2.36E-04	4.38E-04	3.90E-04	3.47E-04	3.24E-04	2.33E-04	2.06E-04	2.30E-04	2.52E-04	2.57E-04	2.99E-04	3.40E-04	3.00E-04	2.24E-04	1.65E-04	1.50E-04	1.25E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2272	0.1907	0.1942	0.2051	0.2136	0.4091	0.4380	0.3944	0.4234	0.3931	0.3851	0.3747	0.3501	0.3337	0.3461	0.3608	0.3598	0.3789	0.3977	0.3606	0.3316	0.3024	0.2916	0.2715
	NO2	g/vehicle/km	0.0411	0.0396	0.0394	0.0408	0.0420	0.0526	0.0541	0.0601	0.0767	0.0710	0.0694	0.0667	0.0691	0.0655	0.0684	0.0713	0.0706	0.0751	0.0800	0.0729	0.0652	0.0577	0.0551	0.0521
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0069***	***0.0046***	***0.0033***	***0.0026***	***0.0023***	***0.0059***	***0.0137***	***0.0280***	***0.0433***	***0.0390***	***0.0352***	***0.0329***	***0.0210***	***0.0188***	***0.0206***	***0.0225***	***0.0233***	***0.0264***	***0.0293***	***0.0254***	***0.0193***	***0.0146***	***0.0131***	***0.0106***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.63E-03	3.10E-03	2.20E-03	1.74E-03	1.53E-03	3.96E-03	9.13E-03	1.86E-02	2.89E-02	2.60E-02	2.35E-02	2.20E-02	1.40E-02	1.25E-02	1.37E-02	1.50E-02	1.55E-02	1.76E-02	1.95E-02	1.69E-02	1.29E-02	9.74E-03	8.75E-03	7.10E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.32E-03	1.55E-03	1.10E-03	8.70E-04	7.65E-04	1.98E-03	4.57E-03	9.32E-03	1.44E-02	1.30E-02	1.17E-02	1.10E-02	7.01E-03	6.25E-03	6.87E-03	7.52E-03	7.76E-03	8.81E-03	9.76E-03	8.46E-03	6.44E-03	4.87E-03	4.38E-03	3.55E-03
	Emission in each Box of 1st jet	g/s	6.62E-04	4.43E-04	3.15E-04	2.49E-04	2.19E-04	5.66E-04	1.30E-03	2.66E-03	4.13E-03	3.71E-03	3.36E-03	3.14E-03	2.00E-03	1.79E-03	1.96E-03	2.15E-03	2.22E-03	2.52E-03	2.79E-03	2.42E-03	1.84E-03	1.39E-03	1.25E-03	1.01E-03
	Emission in each Box of 2nd jet	g/s	3.86E-04	2.58E-04	1.84E-04	1.45E-04	1.28E-04	3.30E-04	7.61E-04	1.55E-03	2.41E-03	2.17E-03	1.96E-03	1.83E-03	1.17E-03	1.04E-03	1.15E-03	1.25E-03	1.29E-03	1.47E-03	1.63E-03	1.41E-03	1.07E-03	8.11E-04	7.29E-04	5.91E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0017***	***0.0043***	***0.0079***	***0.0070***	***0.0064***	***0.0059***	***0.0041***	***0.0037***	***0.0041***	***0.0045***	***0.0046***	***0.0052***	***0.0059***	***0.0051***	***0.0038***	***0.0028***	***0.0025***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.37E-04	6.43E-04	4.47E-04	3.47E-04	3.01E-04	5.10E-04	1.13E-03	2.84E-03	5.24E-03	4.69E-03	4.23E-03	3.91E-03	2.77E-03	2.45E-03	2.72E-03	2.97E-03	3.05E-03	3.49E-03	3.92E-03	3.42E-03	2.53E-03	1.86E-03	1.65E-03	1.36E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.19E-04	3.22E-04	2.24E-04	1.73E-04	1.50E-04	2.55E-04	5.64E-04	1.42E-03	2.62E-03	2.34E-03	2.12E-03	1.95E-03	1.38E-03	1.23E-03	1.36E-03	1.49E-03	1.52E-03	1.75E-03	1.96E-03	1.71E-03	1.27E-03	9.29E-04	8.27E-04	6.81E-04
	Emission in each Box of 1st jet	g/s	1.20E-04	9.19E-05	6.39E-05	4.95E-05	4.30E-05	7.28E-05	1.61E-04	4.06E-04	7.48E-04	6.70E-04	6.05E-04	5.58E-04	3.95E-04	3.51E-04	3.88E-04	4.24E-04	4.35E-04	4.99E-04	5.61E-04	4.89E-04	3.62E-04	2.65E-04	2.36E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	6.98E-05	5.36E-05	3.73E-05	2.89E-05	2.51E-05	4.25E-05	9.39E-05	2.37E-04	4.36E-04	3.91E-04	3.53E-04	3.26E-04	2.31E-04	2.04E-04	2.26E-04	2.48E-04	2.54E-04	2.91E-04	3.27E-04	2.85E-04	2.11E-04	1.55E-04	1.38E-04	1.14E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2188	0.1778	0.1783	0.1861	0.1932	0.3688	0.3891	0.3397	0.3746	0.3474	0.3444	0.3394	0.3223	0.3000	0.3194	0.3293	0.3236	0.3394	0.3575	0.3287	0.3050	0.2841	0.2763	0.2597
	NO2	g/vehicle/km	0.0396	0.0372	0.0365	0.0374	0.0384	0.0478	0.0484	0.0522	0.0684	0.0632	0.0624	0.0608	0.0639	0.0592	0.0634	0.0654	0.0638	0.0676	0.0723	0.0667	0.0602	0.0544	0.0524	0.0500
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0067***	***0.0043***	***0.0030***	***0.0024***	***0.0021***	***0.0054***	***0.0122***	***0.0241***	***0.0383***	***0.0344***	***0.0315***	***0.0298***	***0.0194***	***0.0169***	***0.0190***	***0.0206***	***0.0209***	***0.0237***	***0.0263***	***0.0231***	***0.0178***	***0.0137***	***0.0124***	***0.0102***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.46E-03	2.89E-03	2.02E-03	1.58E-03	1.38E-03	3.57E-03	8.11E-03	1.60E-02	2.56E-02	2.30E-02	2.10E-02	1.99E-02	1.29E-02	1.12E-02	1.27E-02	1.37E-02	1.40E-02	1.58E-02	1.75E-02	1.54E-02	1.18E-02	9.15E-03	8.29E-03	6.79E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.23E-03	1.44E-03	1.01E-03	7.89E-04	6.92E-04	1.78E-03	4.06E-03	8.02E-03	1.28E-02	1.15E-02	1.05E-02	9.94E-03	6.45E-03	5.62E-03	6.34E-03	6.86E-03	6.98E-03	7.89E-03	8.77E-03	7.72E-03	5.92E-03	4.57E-03	4.15E-03	3.39E-03
	Emission in each Box of 1st jet	g/s	6.37E-04	4.13E-04	2.89E-04	2.26E-04	1.98E-04	5.10E-04	1.16E-03	2.29E-03	3.65E-03	3.28E-03	3.00E-03	2.84E-03	1.84E-03	1.61E-03	1.81E-03	1.96E-03	1.99E-03	2.26E-03	2.51E-03	2.20E-03	1.69E-03	1.31E-03	1.18E-03	9.70E-04
	Emission in each Box of 2nd jet	g/s	3.72E-04	2.41E-04	1.69E-04	1.32E-04	1.15E-04	2.97E-04	6.76E-04	1.34E-03	2.13E-03	1.91E-03	1.75E-03	1.66E-03	1.08E-03	9.37E-04	1.06E-03	1.14E-03	1.16E-03	1.32E-03	1.46E-03	1.29E-03	9.87E-04	7.62E-04	6.91E-04	5.66E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0037***	***0.0070***	***0.0063***	***0.0057***	***0.0053***	***0.0038***	***0.0033***	***0.0038***	***0.0041***	***0.0041***	***0.0047***	***0.0053***	***0.0047***	***0.0035***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.08E-04	6.04E-04	4.14E-04	3.18E-04	2.75E-04	4.63E-04	1.01E-03	2.47E-03	4.67E-03	4.18E-03	3.81E-03	3.56E-03	2.56E-03	2.22E-03	2.52E-03	2.72E-03	2.75E-03	3.14E-03	3.55E-03	3.13E-03	2.34E-03	1.75E-03	1.57E-03	1.31E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.04E-04	3.02E-04	2.07E-04	1.59E-04	1.38E-04	2.31E-04	5.05E-04	1.23E-03	2.33E-03	2.09E-03	1.91E-03	1.78E-03	1.28E-03	1.11E-03	1.26E-03	1.36E-03	1.38E-03	1.57E-03	1.77E-03	1.57E-03	1.17E-03	8.76E-04	7.87E-04	6.53E-04
	Emission in each Box of 1st jet	g/s	1.15E-04	8.62E-05	5.92E-05	4.54E-05	3.93E-05	6.61E-05	1.44E-04	3.52E-04	6.67E-04	5.97E-04	5.44E-04	5.09E-04	3.65E-04	3.17E-04	3.59E-04	3.89E-04	3.93E-04	4.49E-04	5.07E-04	4.47E-04	3.34E-04	2.50E-04	2.25E-04	1.87E-04
	Emission in each Box of 2nd jet	g/s	6.73E-05	5.03E-05	3.45E-05	2.65E-05	2.29E-05	3.86E-05	8.41E-05	2.06E-04	3.89E-04	3.48E-04	3.18E-04	2.97E-04	2.13E-04	1.85E-04	2.10E-04	2.27E-04	2.29E-04	2.62E-04	2.96E-04	2.61E-04	1.95E-04	1.46E-04	1.31E-04	1.09E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1995	0.1685	0.1737	0.1796	0.1858	0.3523	0.3716	0.3345	0.3732	0.3423	0.3383	0.3276	0.3110	0.3008	0.3162	0.3287	0.3213	0.3437	0.3708	0.3336	0.3088	0.2849	0.2738	0.2632
	NO2	g/vehicle/km	0.0363	0.0354	0.0357	0.0363	0.0371	0.0458	0.0463	0.0515	0.0682	0.0623	0.0614	0.0587	0.0617	0.0593	0.0627	0.0653	0.0634	0.0684	0.0748	0.0677	0.0609	0.0546	0.0520	0.0506
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0061***	***0.0041***	***0.0030***	***0.0023***	***0.0020***	***0.0051***	***0.0116***	***0.0237***	***0.0382***	***0.0339***	***0.0310***	***0.0288***	***0.0187***	***0.0169***	***0.0188***	***0.0205***	***0.0208***	***0.0240***	***0.0273***	***0.0235***	***0.0180***	***0.0138***	***0.0123***	***0.0103***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.07E-03	2.74E-03	1.97E-03	1.52E-03	1.33E-03	3.41E-03	7.75E-03	1.58E-02	2.55E-02	2.26E-02	2.06E-02	1.92E-02	1.25E-02	1.13E-02	1.26E-02	1.37E-02	1.39E-02	1.60E-02	1.82E-02	1.57E-02	1.20E-02	9.17E-03	8.22E-03	6.88E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.03E-03	1.37E-03	9.85E-04	7.62E-04	6.66E-04	1.71E-03	3.87E-03	7.90E-03	1.27E-02	1.13E-02	1.03E-02	9.60E-03	6.23E-03	5.64E-03	6.28E-03	6.85E-03	6.93E-03	8.00E-03	9.10E-03	7.83E-03	6.00E-03	4.59E-03	4.11E-03	3.44E-03
	Emission in each Box of 1st jet	g/s	5.81E-04	3.91E-04	2.81E-04	2.18E-04	1.90E-04	4.87E-04	1.11E-03	2.26E-03	3.64E-03	3.23E-03	2.95E-03	2.74E-03	1.78E-03	1.61E-03	1.79E-03	1.96E-03	1.98E-03	2.28E-03	2.60E-03	2.24E-03	1.71E-03	1.31E-03	1.17E-03	9.83E-04
	Emission in each Box of 2nd jet	g/s	3.39E-04	2.28E-04	1.64E-04	1.27E-04	1.11E-04	2.84E-04	6.46E-04	1.32E-03	2.12E-03	1.89E-03	1.72E-03	1.60E-03	1.04E-03	9.40E-04	1.05E-03	1.14E-03	1.16E-03	1.33E-03	1.52E-03	1.31E-03	1.00E-03	7.64E-04	6.85E-04	5.73E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0014***	***0.0036***	***0.0070***	***0.0062***	***0.0056***	***0.0052***	***0.0037***	***0.0033***	***0.0037***	***0.0041***	***0.0041***	***0.0048***	***0.0055***	***0.0048***	***0.0036***	***0.0026***	***0.0023***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.41E-04	5.75E-04	4.05E-04	3.08E-04	2.66E-04	4.43E-04	9.65E-04	2.43E-03	4.65E-03	4.12E-03	3.75E-03	3.44E-03	2.47E-03	2.22E-03	2.49E-03	2.72E-03	2.73E-03	3.18E-03	3.67E-03	3.18E-03	2.37E-03	1.76E-03	1.56E-03	1.32E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.70E-04	2.88E-04	2.02E-04	1.54E-04	1.33E-04	2.22E-04	4.83E-04	1.22E-03	2.33E-03	2.06E-03	1.87E-03	1.72E-03	1.24E-03	1.11E-03	1.24E-03	1.36E-03	1.37E-03	1.59E-03	1.84E-03	1.59E-03	1.18E-03	8.78E-04	7.81E-04	6.62E-04
	Emission in each Box of 1st jet	g/s	1.06E-04	8.22E-05	5.78E-05	4.40E-05	3.80E-05	6.33E-05	1.38E-04	3.48E-04	6.65E-04	5.89E-04	5.35E-04	4.91E-04	3.53E-04	3.18E-04	3.56E-04	3.89E-04	3.91E-04	4.55E-04	5.25E-04	4.54E-04	3.38E-04	2.51E-04	2.23E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	6.17E-05	4.79E-05	3.37E-05	2.57E-05	2.21E-05	3.69E-05	8.05E-05	2.03E-04	3.88E-04	3.43E-04	3.12E-04	2.87E-04	2.06E-04	1.85E-04	2.07E-04	2.27E-04	2.28E-04	2.65E-04	3.06E-04	2.65E-04	1.97E-04	1.46E-04	1.30E-04	1.10E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1951	0.1627	0.1665	0.1720	0.1753	0.3434	0.3569	0.3194	0.3538	0.3424	0.3437	0.3433	0.3223	0.3055	0.3224	0.3378	0.3185	0.3393	0.3588	0.3208	0.2891	0.2668	0.2571	0.2400
	NO2	g/vehicle/km	0.0356	0.0342	0.0343	0.0348	0.0351	0.0447	0.0446	0.0492	0.0648	0.0623	0.0623	0.0614	0.0639	0.0602	0.0640	0.0670	0.0628	0.0676	0.0725	0.0652	0.0572	0.0512	0.0489	0.0464
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0060***	***0.0040***	***0.0028***	***0.0022***	***0.0019***	***0.0050***	***0.0112***	***0.0226***	***0.0362***	***0.0340***	***0.0315***	***0.0302***	***0.0194***	***0.0172***	***0.0192***	***0.0211***	***0.0206***	***0.0237***	***0.0264***	***0.0226***	***0.0168***	***0.0129***	***0.0116***	***0.0094***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.98E-03	2.64E-03	1.89E-03	1.46E-03	1.26E-03	3.32E-03	7.44E-03	1.51E-02	2.41E-02	2.26E-02	2.10E-02	2.01E-02	1.29E-02	1.15E-02	1.28E-02	1.41E-02	1.37E-02	1.58E-02	1.76E-02	1.51E-02	1.12E-02	8.59E-03	7.72E-03	6.27E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.99E-03	1.32E-03	9.44E-04	7.30E-04	6.28E-04	1.66E-03	3.72E-03	7.55E-03	1.21E-02	1.13E-02	1.05E-02	1.01E-02	6.45E-03	5.73E-03	6.40E-03	7.04E-03	6.87E-03	7.89E-03	8.81E-03	7.53E-03	5.62E-03	4.30E-03	3.86E-03	3.14E-03
	Emission in each Box of 1st jet	g/s	5.68E-04	3.78E-04	2.70E-04	2.08E-04	1.79E-04	4.75E-04	1.06E-03	2.16E-03	3.45E-03	3.23E-03	3.00E-03	2.87E-03	1.84E-03	1.64E-03	1.83E-03	2.01E-03	1.96E-03	2.26E-03	2.52E-03	2.15E-03	1.60E-03	1.23E-03	1.10E-03	8.96E-04
	Emission in each Box of 2nd jet	g/s	3.31E-04	2.20E-04	1.57E-04	1.22E-04	1.05E-04	2.77E-04	6.20E-04	1.26E-03	2.01E-03	1.89E-03	1.75E-03	1.68E-03	1.08E-03	9.54E-04	1.07E-03	1.17E-03	1.15E-03	1.32E-03	1.47E-03	1.26E-03	9.36E-04	7.16E-04	6.43E-04	5.23E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0035***	***0.0066***	***0.0062***	***0.0057***	***0.0054***	***0.0038***	***0.0034***	***0.0038***	***0.0042***	***0.0041***	***0.0047***	***0.0053***	***0.0046***	***0.0033***	***0.0025***	***0.0022***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.25E-04	5.56E-04	3.89E-04	2.95E-04	2.52E-04	4.32E-04	9.30E-04	2.33E-03	4.42E-03	4.12E-03	3.80E-03	3.60E-03	2.56E-03	2.26E-03	2.54E-03	2.79E-03	2.71E-03	3.15E-03	3.56E-03	3.06E-03	2.22E-03	1.65E-03	1.47E-03	1.21E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.63E-04	2.78E-04	1.94E-04	1.48E-04	1.26E-04	2.16E-04	4.65E-04	1.16E-03	2.21E-03	2.06E-03	1.90E-03	1.80E-03	1.28E-03	1.13E-03	1.27E-03	1.40E-03	1.36E-03	1.57E-03	1.78E-03	1.53E-03	1.11E-03	8.25E-04	7.35E-04	6.06E-04
	Emission in each Box of 1st jet	g/s	1.04E-04	7.95E-05	5.56E-05	4.22E-05	3.59E-05	6.18E-05	1.33E-04	3.32E-04	6.32E-04	5.89E-04	5.43E-04	5.14E-04	3.65E-04	3.23E-04	3.63E-04	3.99E-04	3.87E-04	4.49E-04	5.08E-04	4.37E-04	3.18E-04	2.36E-04	2.10E-04	1.73E-04
	Emission in each Box of 2nd jet	g/s	6.05E-05	4.64E-05	3.24E-05	2.46E-05	2.10E-05	3.60E-05	7.75E-05	1.94E-04	3.69E-04	3.43E-04	3.17E-04	3.00E-04	2.13E-04	1.88E-04	2.12E-04	2.33E-04	2.26E-04	2.62E-04	2.97E-04	2.55E-04	1.85E-04	1.37E-04	1.22E-04	1.01E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2062	0.1672	0.1722	0.1811	0.1858	0.3509	0.3700	0.3180	0.3572	0.3357	0.3361	0.3289	0.3135	0.3050	0.3228	0.3334	0.3395	0.3551	0.3788	0.3391	0.3028	0.2709	0.2666	0.2523
	NO2	g/vehicle/km	0.0375	0.0351	0.0354	0.0365	0.0371	0.0456	0.0461	0.0490	0.0654	0.0612	0.0610	0.0589	0.0622	0.0601	0.0640	0.0662	0.0668	0.0706	0.0763	0.0687	0.0598	0.0520	0.0506	0.0486
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0063***	***0.0041***	***0.0029***	***0.0023***	***0.0020***	***0.0051***	***0.0116***	***0.0225***	***0.0366***	***0.0333***	***0.0308***	***0.0289***	***0.0188***	***0.0172***	***0.0192***	***0.0208***	***0.0220***	***0.0248***	***0.0279***	***0.0239***	***0.0176***	***0.0131***	***0.0120***	***0.0099***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.20E-03	2.72E-03	1.95E-03	1.54E-03	1.33E-03	3.40E-03	7.72E-03	1.50E-02	2.44E-02	2.22E-02	2.05E-02	1.93E-02	1.26E-02	1.14E-02	1.28E-02	1.39E-02	1.47E-02	1.65E-02	1.86E-02	1.59E-02	1.18E-02	8.72E-03	8.00E-03	6.60E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.10E-03	1.36E-03	9.77E-04	7.68E-04	6.66E-04	1.70E-03	3.86E-03	7.51E-03	1.22E-02	1.11E-02	1.03E-02	9.63E-03	6.28E-03	5.72E-03	6.41E-03	6.94E-03	7.33E-03	8.26E-03	9.30E-03	7.96E-03	5.88E-03	4.36E-03	4.00E-03	3.30E-03
	Emission in each Box of 1st jet	g/s	6.00E-04	3.88E-04	2.79E-04	2.20E-04	1.90E-04	4.85E-04	1.10E-03	2.15E-03	3.48E-03	3.17E-03	2.93E-03	2.75E-03	1.79E-03	1.63E-03	1.83E-03	1.98E-03	2.09E-03	2.36E-03	2.66E-03	2.27E-03	1.68E-03	1.25E-03	1.14E-03	9.42E-04
	Emission in each Box of 2nd jet	g/s	3.50E-04	2.26E-04	1.63E-04	1.28E-04	1.11E-04	2.83E-04	6.43E-04	1.25E-03	2.03E-03	1.85E-03	1.71E-03	1.61E-03	1.05E-03	9.53E-04	1.07E-03	1.16E-03	1.22E-03	1.38E-03	1.55E-03	1.33E-03	9.80E-04	7.27E-04	6.67E-04	5.50E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0014***	***0.0035***	***0.0067***	***0.0061***	***0.0056***	***0.0052***	***0.0037***	***0.0034***	***0.0038***	***0.0041***	***0.0043***	***0.0049***	***0.0056***	***0.0048***	***0.0035***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.65E-04	5.70E-04	4.02E-04	3.10E-04	2.66E-04	4.41E-04	9.62E-04	2.32E-03	4.46E-03	4.04E-03	3.72E-03	3.45E-03	2.49E-03	2.25E-03	2.54E-03	2.76E-03	2.88E-03	3.28E-03	3.75E-03	3.23E-03	2.32E-03	1.67E-03	1.52E-03	1.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.82E-04	2.85E-04	2.01E-04	1.55E-04	1.33E-04	2.21E-04	4.81E-04	1.16E-03	2.23E-03	2.02E-03	1.86E-03	1.73E-03	1.25E-03	1.13E-03	1.27E-03	1.38E-03	1.44E-03	1.64E-03	1.87E-03	1.61E-03	1.16E-03	8.37E-04	7.60E-04	6.35E-04
	Emission in each Box of 1st jet	g/s	1.09E-04	8.14E-05	5.74E-05	4.43E-05	3.80E-05	6.30E-05	1.37E-04	3.31E-04	6.38E-04	5.78E-04	5.32E-04	4.93E-04	3.56E-04	3.22E-04	3.63E-04	3.94E-04	4.12E-04	4.69E-04	5.35E-04	4.61E-04	3.32E-04	2.39E-04	2.17E-04	1.82E-04
	Emission in each Box of 2nd jet	g/s	6.37E-05	4.75E-05	3.35E-05	2.58E-05	2.21E-05	3.68E-05	8.01E-05	1.93E-04	3.72E-04	3.37E-04	3.10E-04	2.88E-04	2.08E-04	1.88E-04	2.12E-04	2.30E-04	2.40E-04	2.74E-04	3.12E-04	2.69E-04	1.94E-04	1.39E-04	1.27E-04	1.06E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2048	0.1708	0.1698	0.1736	0.1849	0.3418	0.3620	0.3127	0.3422	0.3210	0.3332	0.3142	0.3083	0.2965	0.3206	0.3164	0.3060	0.3365	0.3619	0.3241	0.3025	0.2734	0.2658	0.2495
	NO2	g/vehicle/km	0.0373	0.0358	0.0349	0.0351	0.0369	0.0445	0.0452	0.0482	0.0627	0.0585	0.0605	0.0564	0.0612	0.0585	0.0636	0.0629	0.0605	0.0670	0.0731	0.0658	0.0598	0.0524	0.0505	0.0481
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0063***	***0.0042***	***0.0029***	***0.0022***	***0.0020***	***0.0050***	***0.0113***	***0.0222***	***0.0350***	***0.0318***	***0.0305***	***0.0276***	***0.0185***	***0.0167***	***0.0191***	***0.0198***	***0.0198***	***0.0235***	***0.0266***	***0.0228***	***0.0176***	***0.0132***	***0.0120***	***0.0098***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.17E-03	2.78E-03	1.93E-03	1.47E-03	1.32E-03	3.31E-03	7.55E-03	1.48E-02	2.33E-02	2.12E-02	2.03E-02	1.84E-02	1.23E-02	1.11E-02	1.27E-02	1.32E-02	1.32E-02	1.57E-02	1.78E-02	1.52E-02	1.18E-02	8.80E-03	7.98E-03	6.52E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.09E-03	1.39E-03	9.63E-04	7.37E-04	6.62E-04	1.65E-03	3.77E-03	7.39E-03	1.17E-02	1.06E-02	1.02E-02	9.20E-03	6.17E-03	5.56E-03	6.36E-03	6.59E-03	6.60E-03	7.83E-03	8.88E-03	7.61E-03	5.88E-03	4.40E-03	3.99E-03	3.26E-03
	Emission in each Box of 1st jet	g/s	5.96E-04	3.97E-04	2.75E-04	2.11E-04	1.89E-04	4.73E-04	1.08E-03	2.11E-03	3.34E-03	3.03E-03	2.90E-03	2.63E-03	1.76E-03	1.59E-03	1.82E-03	1.88E-03	1.89E-03	2.24E-03	2.54E-03	2.17E-03	1.68E-03	1.26E-03	1.14E-03	9.32E-04
	Emission in each Box of 2nd jet	g/s	3.48E-04	2.31E-04	1.61E-04	1.23E-04	1.10E-04	2.76E-04	6.29E-04	1.23E-03	1.95E-03	1.77E-03	1.69E-03	1.53E-03	1.03E-03	9.26E-04	1.06E-03	1.10E-03	1.10E-03	1.30E-03	1.48E-03	1.27E-03	9.79E-04	7.34E-04	6.65E-04	5.44E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0034***	***0.0064***	***0.0058***	***0.0055***	***0.0050***	***0.0037***	***0.0033***	***0.0038***	***0.0039***	***0.0039***	***0.0047***	***0.0054***	***0.0046***	***0.0035***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.60E-04	5.82E-04	3.96E-04	2.98E-04	2.64E-04	4.30E-04	9.42E-04	2.28E-03	4.28E-03	3.87E-03	3.69E-03	3.30E-03	2.45E-03	2.19E-03	2.52E-03	2.62E-03	2.61E-03	3.12E-03	3.59E-03	3.09E-03	2.32E-03	1.69E-03	1.52E-03	1.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.80E-04	2.91E-04	1.98E-04	1.49E-04	1.32E-04	2.15E-04	4.71E-04	1.14E-03	2.14E-03	1.93E-03	1.85E-03	1.65E-03	1.22E-03	1.10E-03	1.26E-03	1.31E-03	1.31E-03	1.56E-03	1.79E-03	1.54E-03	1.16E-03	8.44E-04	7.58E-04	6.29E-04
	Emission in each Box of 1st jet	g/s	1.09E-04	8.32E-05	5.66E-05	4.26E-05	3.77E-05	6.15E-05	1.35E-04	3.26E-04	6.12E-04	5.53E-04	5.28E-04	4.72E-04	3.50E-04	3.13E-04	3.61E-04	3.74E-04	3.73E-04	4.45E-04	5.13E-04	4.41E-04	3.32E-04	2.41E-04	2.17E-04	1.80E-04
	Emission in each Box of 2nd jet	g/s	6.33E-05	4.85E-05	3.30E-05	2.48E-05	2.20E-05	3.59E-05	7.85E-05	1.90E-04	3.57E-04	3.22E-04	3.08E-04	2.75E-04	2.04E-04	1.83E-04	2.10E-04	2.18E-04	2.18E-04	2.60E-04	2.99E-04	2.57E-04	1.94E-04	1.41E-04	1.26E-04	1.05E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2331	0.1970	0.1972	0.2050	0.2137	0.4114	0.4316	0.3731	0.4067	0.3773	0.3722	0.3674	0.3514	0.3308	0.3451	0.3632	0.3523	0.3770	0.4051	0.3657	0.3393	0.3070	0.3012	0.2878
	NO2	g/vehicle/km	0.0419	0.0407	0.0399	0.0408	0.0419	0.0529	0.0533	0.0569	0.0738	0.0682	0.0671	0.0654	0.0693	0.0649	0.0681	0.0717	0.0692	0.0747	0.0813	0.0738	0.0666	0.0585	0.0568	0.0550
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0071***	***0.0048***	***0.0034***	***0.0026***	***0.0023***	***0.0060***	***0.0135***	***0.0264***	***0.0416***	***0.0374***	***0.0341***	***0.0323***	***0.0211***	***0.0186***	***0.0205***	***0.0227***	***0.0228***	***0.0263***	***0.0298***	***0.0258***	***0.0198***	***0.0148***	***0.0136***	***0.0113***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.75E-03	3.20E-03	2.24E-03	1.74E-03	1.53E-03	3.98E-03	9.00E-03	1.76E-02	2.77E-02	2.49E-02	2.27E-02	2.15E-02	1.41E-02	1.24E-02	1.37E-02	1.51E-02	1.52E-02	1.75E-02	1.99E-02	1.72E-02	1.32E-02	9.88E-03	9.04E-03	7.52E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.38E-03	1.60E-03	1.12E-03	8.70E-04	7.66E-04	1.99E-03	4.50E-03	8.81E-03	1.39E-02	1.25E-02	1.14E-02	1.08E-02	7.04E-03	6.20E-03	6.85E-03	7.57E-03	7.60E-03	8.77E-03	9.94E-03	8.58E-03	6.59E-03	4.94E-03	4.52E-03	3.76E-03
	Emission in each Box of 1st jet	g/s	6.79E-04	4.57E-04	3.20E-04	2.49E-04	2.19E-04	5.69E-04	1.29E-03	2.52E-03	3.96E-03	3.56E-03	3.24E-03	3.08E-03	2.01E-03	1.77E-03	1.96E-03	2.16E-03	2.17E-03	2.51E-03	2.84E-03	2.45E-03	1.88E-03	1.41E-03	1.29E-03	1.07E-03
	Emission in each Box of 2nd jet	g/s	3.96E-04	2.67E-04	1.86E-04	1.45E-04	1.28E-04	3.32E-04	7.50E-04	1.47E-03	2.31E-03	2.08E-03	1.89E-03	1.79E-03	1.17E-03	1.03E-03	1.14E-03	1.26E-03	1.27E-03	1.46E-03	1.66E-03	1.43E-03	1.10E-03	8.24E-04	7.54E-04	6.27E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0017***	***0.0040***	***0.0076***	***0.0068***	***0.0061***	***0.0058***	***0.0042***	***0.0036***	***0.0041***	***0.0045***	***0.0045***	***0.0052***	***0.0060***	***0.0052***	***0.0039***	***0.0028***	***0.0026***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.55E-04	6.61E-04	4.53E-04	3.46E-04	3.00E-04	5.12E-04	1.11E-03	2.69E-03	5.04E-03	4.51E-03	4.10E-03	3.83E-03	2.77E-03	2.43E-03	2.71E-03	2.99E-03	2.99E-03	3.47E-03	3.99E-03	3.47E-03	2.59E-03	1.88E-03	1.70E-03	1.44E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.28E-04	3.30E-04	2.26E-04	1.73E-04	1.50E-04	2.56E-04	5.56E-04	1.35E-03	2.52E-03	2.25E-03	2.05E-03	1.92E-03	1.39E-03	1.22E-03	1.35E-03	1.49E-03	1.49E-03	1.74E-03	2.00E-03	1.73E-03	1.29E-03	9.41E-04	8.52E-04	7.19E-04
	Emission in each Box of 1st jet	g/s	1.22E-04	9.44E-05	6.47E-05	4.94E-05	4.29E-05	7.31E-05	1.59E-04	3.84E-04	7.20E-04	6.44E-04	5.85E-04	5.48E-04	3.96E-04	3.47E-04	3.87E-04	4.27E-04	4.26E-04	4.96E-04	5.70E-04	4.95E-04	3.69E-04	2.69E-04	2.44E-04	2.05E-04
	Emission in each Box of 2nd jet	g/s	7.13E-05	5.51E-05	3.77E-05	2.88E-05	2.50E-05	4.27E-05	9.26E-05	2.24E-04	4.20E-04	3.76E-04	3.41E-04	3.19E-04	2.31E-04	2.03E-04	2.25E-04	2.49E-04	2.49E-04	2.90E-04	3.33E-04	2.89E-04	2.16E-04	1.57E-04	1.42E-04	1.20E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2549	0.2115	0.2147	0.2246	0.2335	0.4450	0.4716	0.4033	0.4394	0.4064	0.4021	0.3912	0.3761	0.3574	0.3745	0.3878	0.3774	0.4013	0.4312	0.3959	0.3632	0.3347	0.3267	0.3104
	NO2	g/vehicle/km	0.0455	0.0434	0.0431	0.0442	0.0454	0.0570	0.0580	0.0613	0.0793	0.0731	0.0720	0.0693	0.0737	0.0696	0.0735	0.0762	0.0737	0.0791	0.0862	0.0795	0.0709	0.0633	0.0612	0.0589
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0078***	***0.0052***	***0.0037***	***0.0029***	***0.0025***	***0.0065***	***0.0148***	***0.0286***	***0.0450***	***0.0403***	***0.0368***	***0.0344***	***0.0226***	***0.0201***	***0.0223***	***0.0242***	***0.0244***	***0.0280***	***0.0317***	***0.0279***	***0.0212***	***0.0162***	***0.0147***	***0.0122***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.20E-03	3.44E-03	2.44E-03	1.91E-03	1.67E-03	4.31E-03	9.83E-03	1.91E-02	3.00E-02	2.69E-02	2.45E-02	2.29E-02	1.51E-02	1.34E-02	1.49E-02	1.62E-02	1.63E-02	1.87E-02	2.12E-02	1.86E-02	1.41E-02	1.08E-02	9.81E-03	8.11E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.60E-03	1.72E-03	1.22E-03	9.53E-04	8.36E-04	2.15E-03	4.92E-03	9.53E-03	1.50E-02	1.34E-02	1.23E-02	1.15E-02	7.53E-03	6.70E-03	7.43E-03	8.08E-03	8.14E-03	9.34E-03	1.06E-02	9.29E-03	7.05E-03	5.39E-03	4.90E-03	4.06E-03
	Emission in each Box of 1st jet	g/s	7.42E-04	4.91E-04	3.48E-04	2.72E-04	2.39E-04	6.15E-04	1.40E-03	2.72E-03	4.28E-03	3.84E-03	3.51E-03	3.27E-03	2.15E-03	1.91E-03	2.12E-03	2.31E-03	2.33E-03	2.67E-03	3.02E-03	2.66E-03	2.02E-03	1.54E-03	1.40E-03	1.16E-03
	Emission in each Box of 2nd jet	g/s	4.33E-04	2.86E-04	2.03E-04	1.59E-04	1.39E-04	3.59E-04	8.19E-04	1.59E-03	2.50E-03	2.24E-03	2.04E-03	1.91E-03	1.25E-03	1.12E-03	1.24E-03	1.35E-03	1.36E-03	1.56E-03	1.76E-03	1.55E-03	1.18E-03	8.98E-04	8.17E-04	6.76E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0007***	***0.0006***	***0.0005***	***0.0008***	***0.0018***	***0.0043***	***0.0081***	***0.0072***	***0.0066***	***0.0061***	***0.0044***	***0.0039***	***0.0044***	***0.0048***	***0.0048***	***0.0055***	***0.0063***	***0.0056***	***0.0041***	***0.0031***	***0.0028***	***0.0023***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.28E-04	7.06E-04	4.88E-04	3.75E-04	3.25E-04	5.51E-04	1.21E-03	2.90E-03	5.41E-03	4.83E-03	4.40E-03	4.06E-03	2.95E-03	2.61E-03	2.92E-03	3.17E-03	3.18E-03	3.68E-03	4.23E-03	3.73E-03	2.75E-03	2.04E-03	1.84E-03	1.54E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.64E-04	3.53E-04	2.44E-04	1.88E-04	1.63E-04	2.76E-04	6.04E-04	1.45E-03	2.71E-03	2.41E-03	2.20E-03	2.03E-03	1.48E-03	1.30E-03	1.46E-03	1.59E-03	1.59E-03	1.84E-03	2.12E-03	1.87E-03	1.38E-03	1.02E-03	9.19E-04	7.70E-04
	Emission in each Box of 1st jet	g/s	1.33E-04	1.01E-04	6.98E-05	5.36E-05	4.65E-05	7.88E-05	1.73E-04	4.14E-04	7.73E-04	6.90E-04	6.28E-04	5.80E-04	4.22E-04	3.73E-04	4.17E-04	4.53E-04	4.54E-04	5.26E-04	6.04E-04	5.33E-04	3.93E-04	2.91E-04	2.63E-04	2.20E-04
	Emission in each Box of 2nd jet	g/s	7.73E-05	5.88E-05	4.07E-05	3.13E-05	2.71E-05	4.59E-05	1.01E-04	2.42E-04	4.51E-04	4.02E-04	3.66E-04	3.38E-04	2.46E-04	2.17E-04	2.43E-04	2.65E-04	2.65E-04	3.07E-04	3.53E-04	3.11E-04	2.30E-04	1.70E-04	1.53E-04	1.28E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2648	0.2212	0.2246	0.2353	0.2435	0.4586	0.4859	0.4178	0.4523	0.4179	0.4134	0.4050	0.3872	0.3662	0.3840	0.3984	0.3903	0.4190	0.4449	0.4081	0.3752	0.3457	0.3379	0.3223
	NO2	g/vehicle/km	0.0469	0.0449	0.0445	0.0457	0.0468	0.0584	0.0594	0.0631	0.0812	0.0747	0.0736	0.0713	0.0754	0.0710	0.0750	0.0779	0.0758	0.0821	0.0884	0.0815	0.0728	0.0650	0.0629	0.0608
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0081***	***0.0054***	***0.0038***	***0.0030***	***0.0026***	***0.0067***	***0.0152***	***0.0296***	***0.0463***	***0.0414***	***0.0378***	***0.0356***	***0.0233***	***0.0206***	***0.0229***	***0.0249***	***0.0253***	***0.0292***	***0.0328***	***0.0287***	***0.0219***	***0.0167***	***0.0152***	***0.0126***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.40E-03	3.59E-03	2.55E-03	2.00E-03	1.74E-03	4.44E-03	1.01E-02	1.97E-02	3.09E-02	2.76E-02	2.52E-02	2.37E-02	1.55E-02	1.37E-02	1.52E-02	1.66E-02	1.68E-02	1.95E-02	2.18E-02	1.92E-02	1.46E-02	1.11E-02	1.01E-02	8.43E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.70E-03	1.80E-03	1.27E-03	9.98E-04	8.72E-04	2.22E-03	5.07E-03	9.87E-03	1.54E-02	1.38E-02	1.26E-02	1.19E-02	7.75E-03	6.86E-03	7.62E-03	8.30E-03	8.42E-03	9.75E-03	1.09E-02	9.58E-03	7.29E-03	5.56E-03	5.07E-03	4.21E-03
	Emission in each Box of 1st jet	g/s	7.71E-04	5.13E-04	3.64E-04	2.85E-04	2.49E-04	6.34E-04	1.45E-03	2.82E-03	4.41E-03	3.95E-03	3.60E-03	3.39E-03	2.21E-03	1.96E-03	2.18E-03	2.37E-03	2.41E-03	2.79E-03	3.12E-03	2.74E-03	2.08E-03	1.59E-03	1.45E-03	1.20E-03
	Emission in each Box of 2nd jet	g/s	4.50E-04	2.99E-04	2.12E-04	1.66E-04	1.45E-04	3.70E-04	8.44E-04	1.65E-03	2.57E-03	2.30E-03	2.10E-03	1.98E-03	1.29E-03	1.14E-03	1.27E-03	1.38E-03	1.40E-03	1.62E-03	1.82E-03	1.60E-03	1.21E-03	9.27E-04	8.45E-04	7.02E-04
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0008***	***0.0019***	***0.0045***	***0.0083***	***0.0074***	***0.0067***	***0.0063***	***0.0045***	***0.0040***	***0.0045***	***0.0049***	***0.0049***	***0.0057***	***0.0065***	***0.0057***	***0.0042***	***0.0031***	***0.0028***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.57E-04	7.29E-04	5.05E-04	3.88E-04	3.35E-04	5.65E-04	1.24E-03	2.98E-03	5.54E-03	4.94E-03	4.49E-03	4.18E-03	3.02E-03	2.66E-03	2.98E-03	3.25E-03	3.27E-03	3.82E-03	4.34E-03	3.82E-03	2.83E-03	2.09E-03	1.89E-03	1.59E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.78E-04	3.64E-04	2.52E-04	1.94E-04	1.68E-04	2.82E-04	6.19E-04	1.49E-03	2.77E-03	2.47E-03	2.25E-03	2.09E-03	1.51E-03	1.33E-03	1.49E-03	1.62E-03	1.64E-03	1.91E-03	2.17E-03	1.91E-03	1.41E-03	1.05E-03	9.44E-04	7.95E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	1.04E-04	7.21E-05	5.54E-05	4.79E-05	8.07E-05	1.77E-04	4.26E-04	7.91E-04	7.05E-04	6.42E-04	5.97E-04	4.32E-04	3.80E-04	4.26E-04	4.64E-04	4.67E-04	5.46E-04	6.20E-04	5.46E-04	4.04E-04	2.99E-04	2.70E-04	2.27E-04
	Emission in each Box of 2nd jet	g/s	7.97E-05	6.07E-05	4.20E-05	3.23E-05	2.79E-05	4.71E-05	1.03E-04	2.48E-04	4.61E-04	4.11E-04	3.74E-04	3.48E-04	2.52E-04	2.22E-04	2.48E-04	2.71E-04	2.73E-04	3.18E-04	3.62E-04	3.19E-04	2.36E-04	1.74E-04	1.57E-04	1.32E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2539	0.2236	0.2256	0.2392	0.2425	0.3955	0.4137	0.3775	0.4180	0.3998	0.3793	0.3849	0.3728	0.3691	0.3737	0.3733	0.3886	0.4017	0.4082	0.3979	0.3643	0.3576	0.3464	0.3252
	NO2	g/vehicle/km	0.0482	0.0469	0.0472	0.0477	0.0480	0.0559	0.0573	0.0635	0.0805	0.0772	0.0729	0.0736	0.0637	0.0623	0.0638	0.0636	0.0656	0.0680	0.0701	0.0697	0.0617	0.0574	0.0552	0.0527
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0064***	***0.0046***	***0.0032***	***0.0025***	***0.0021***	***0.0041***	***0.0092***	***0.0210***	***0.0350***	***0.0325***	***0.0283***	***0.0275***	***0.0240***	***0.0222***	***0.0239***	***0.0250***	***0.0271***	***0.0301***	***0.0323***	***0.0303***	***0.0228***	***0.0184***	***0.0167***	***0.0137***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.28E-03	3.06E-03	2.13E-03	1.68E-03	1.41E-03	2.73E-03	6.10E-03	1.40E-02	2.33E-02	2.16E-02	1.89E-02	1.83E-02	1.60E-02	1.48E-02	1.59E-02	1.67E-02	1.80E-02	2.01E-02	2.16E-02	2.02E-02	1.52E-02	1.23E-02	1.11E-02	9.16E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.14E-03	1.53E-03	1.06E-03	8.38E-04	7.05E-04	1.37E-03	3.05E-03	7.00E-03	1.17E-02	1.08E-02	9.44E-03	9.16E-03	7.99E-03	7.42E-03	7.95E-03	8.33E-03	9.02E-03	1.00E-02	1.08E-02	1.01E-02	7.60E-03	6.14E-03	5.55E-03	4.58E-03
	Emission in each Box of 1st jet	g/s	6.12E-04	4.38E-04	3.04E-04	2.39E-04	2.01E-04	3.90E-04	8.72E-04	2.00E-03	3.33E-03	3.09E-03	2.70E-03	2.62E-03	2.28E-03	2.12E-03	2.27E-03	2.38E-03	2.58E-03	2.87E-03	3.08E-03	2.88E-03	2.17E-03	1.76E-03	1.59E-03	1.31E-03
	Emission in each Box of 2nd jet	g/s	1.07E-03	7.66E-04	5.32E-04	4.19E-04	3.52E-04	6.83E-04	1.53E-03	3.50E-03	5.83E-03	5.41E-03	4.72E-03	4.58E-03	3.99E-03	3.71E-03	3.98E-03	4.17E-03	4.51E-03	5.02E-03	5.39E-03	5.04E-03	3.80E-03	3.07E-03	2.78E-03	2.29E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0035***	***0.0067***	***0.0063***	***0.0054***	***0.0053***	***0.0041***	***0.0038***	***0.0041***	***0.0043***	***0.0046***	***0.0051***	***0.0056***	***0.0053***	***0.0039***	***0.0030***	***0.0027***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.13E-04	6.42E-04	4.46E-04	3.34E-04	2.79E-04	3.86E-04	8.45E-04	2.36E-03	4.49E-03	4.18E-03	3.63E-03	3.51E-03	2.73E-03	2.50E-03	2.71E-03	2.84E-03	3.04E-03	3.40E-03	3.70E-03	3.53E-03	2.57E-03	1.97E-03	1.77E-03	1.48E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.07E-04	3.21E-04	2.23E-04	1.67E-04	1.39E-04	1.93E-04	4.22E-04	1.18E-03	2.25E-03	2.09E-03	1.81E-03	1.75E-03	1.37E-03	1.25E-03	1.36E-03	1.42E-03	1.52E-03	1.70E-03	1.85E-03	1.77E-03	1.29E-03	9.86E-04	8.85E-04	7.42E-04
	Emission in each Box of 1st jet	g/s	1.16E-04	9.17E-05	6.37E-05	4.78E-05	3.99E-05	5.52E-05	1.21E-04	3.37E-04	6.42E-04	5.97E-04	5.18E-04	5.01E-04	3.90E-04	3.58E-04	3.88E-04	4.06E-04	4.35E-04	4.86E-04	5.29E-04	5.04E-04	3.68E-04	2.82E-04	2.53E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	2.03E-04	1.61E-04	1.11E-04	8.36E-05	6.97E-05	9.66E-05	2.11E-04	5.89E-04	1.12E-03	1.04E-03	9.07E-04	8.76E-04	6.83E-04	6.26E-04	6.78E-04	7.10E-04	7.61E-04	8.50E-04	9.26E-04	8.83E-04	6.43E-04	4.93E-04	4.42E-04	3.71E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2319	0.2036	0.2045	0.2179	0.2272	0.3749	0.3939	0.3565	0.3956	0.3832	0.3648	0.3683	0.3552	0.3474	0.3541	0.3547	0.3690	0.3772	0.3741	0.3642	0.3316	0.3264	0.3165	0.2967
	NO2	g/vehicle/km	0.0446	0.0433	0.0435	0.0442	0.0456	0.0535	0.0549	0.0605	0.0770	0.0745	0.0706	0.0710	0.0612	0.0592	0.0610	0.0610	0.0628	0.0643	0.0649	0.0644	0.0568	0.0530	0.0510	0.0487
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0059***	***0.0042***	***0.0029***	***0.0023***	***0.0020***	***0.0039***	***0.0087***	***0.0198***	***0.0331***	***0.0311***	***0.0272***	***0.0263***	***0.0228***	***0.0209***	***0.0226***	***0.0238***	***0.0257***	***0.0283***	***0.0296***	***0.0277***	***0.0208***	***0.0168***	***0.0152***	***0.0125***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.91E-03	2.79E-03	1.93E-03	1.53E-03	1.32E-03	2.59E-03	5.81E-03	1.32E-02	2.21E-02	2.07E-02	1.81E-02	1.75E-02	1.52E-02	1.40E-02	1.51E-02	1.58E-02	1.71E-02	1.89E-02	1.98E-02	1.85E-02	1.38E-02	1.12E-02	1.01E-02	8.36E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.96E-03	1.39E-03	9.65E-04	7.63E-04	6.60E-04	1.29E-03	2.91E-03	6.61E-03	1.10E-02	1.04E-02	9.07E-03	8.77E-03	7.61E-03	6.98E-03	7.53E-03	7.92E-03	8.57E-03	9.43E-03	9.88E-03	9.23E-03	6.92E-03	5.61E-03	5.07E-03	4.18E-03
	Emission in each Box of 1st jet	g/s	5.59E-04	3.98E-04	2.76E-04	2.18E-04	1.89E-04	3.70E-04	8.30E-04	1.89E-03	3.15E-03	2.96E-03	2.59E-03	2.51E-03	2.17E-03	1.99E-03	2.15E-03	2.26E-03	2.45E-03	2.69E-03	2.82E-03	2.64E-03	1.98E-03	1.60E-03	1.45E-03	1.19E-03
	Emission in each Box of 2nd jet	g/s	9.78E-04	6.97E-04	4.82E-04	3.82E-04	3.30E-04	6.47E-04	1.45E-03	3.31E-03	5.52E-03	5.18E-03	4.54E-03	4.38E-03	3.80E-03	3.49E-03	3.77E-03	3.96E-03	4.28E-03	4.72E-03	4.94E-03	4.62E-03	3.46E-03	2.80E-03	2.54E-03	2.09E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0034***	***0.0064***	***0.0060***	***0.0053***	***0.0051***	***0.0039***	***0.0036***	***0.0039***	***0.0041***	***0.0044***	***0.0048***	***0.0051***	***0.0049***	***0.0036***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.53E-04	5.93E-04	4.10E-04	3.10E-04	2.65E-04	3.70E-04	8.11E-04	2.25E-03	4.29E-03	4.03E-03	3.51E-03	3.38E-03	2.62E-03	2.38E-03	2.59E-03	2.72E-03	2.91E-03	3.22E-03	3.43E-03	3.27E-03	2.37E-03	1.82E-03	1.64E-03	1.37E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.77E-04	2.97E-04	2.05E-04	1.55E-04	1.33E-04	1.85E-04	4.05E-04	1.12E-03	2.15E-03	2.02E-03	1.76E-03	1.69E-03	1.31E-03	1.19E-03	1.30E-03	1.36E-03	1.46E-03	1.61E-03	1.71E-03	1.63E-03	1.19E-03	9.11E-04	8.18E-04	6.85E-04
	Emission in each Box of 1st jet	g/s	1.08E-04	8.47E-05	5.86E-05	4.42E-05	3.79E-05	5.28E-05	1.16E-04	3.21E-04	6.14E-04	5.76E-04	5.02E-04	4.83E-04	3.75E-04	3.40E-04	3.71E-04	3.89E-04	4.16E-04	4.59E-04	4.90E-04	4.67E-04	3.39E-04	2.60E-04	2.34E-04	1.96E-04
	Emission in each Box of 2nd jet	g/s	1.88E-04	1.48E-04	1.03E-04	7.74E-05	6.63E-05	9.24E-05	2.03E-04	5.62E-04	1.07E-03	1.01E-03	8.79E-04	8.45E-04	6.56E-04	5.95E-04	6.49E-04	6.81E-04	7.29E-04	8.04E-04	8.57E-04	8.17E-04	5.93E-04	4.55E-04	4.09E-04	3.43E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2341	0.2034	0.2046	0.2184	0.2230	0.3659	0.3816	0.3510	0.3885	0.3722	0.3464	0.3506	0.3374	0.3345	0.3382	0.3390	0.3545	0.3658	0.3722	0.3646	0.3359	0.3273	0.3225	0.3035
	NO2	g/vehicle/km	0.0451	0.0434	0.0436	0.0443	0.0449	0.0523	0.0533	0.0597	0.0757	0.0726	0.0674	0.0679	0.0585	0.0573	0.0586	0.0586	0.0606	0.0627	0.0647	0.0646	0.0575	0.0532	0.0520	0.0498
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0059***	***0.0042***	***0.0029***	***0.0023***	***0.0019***	***0.0038***	***0.0084***	***0.0195***	***0.0325***	***0.0302***	***0.0258***	***0.0250***	***0.0217***	***0.0202***	***0.0216***	***0.0227***	***0.0247***	***0.0274***	***0.0295***	***0.0277***	***0.0210***	***0.0169***	***0.0155***	***0.0128***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.95E-03	2.79E-03	1.93E-03	1.53E-03	1.30E-03	2.53E-03	5.63E-03	1.30E-02	2.17E-02	2.01E-02	1.72E-02	1.67E-02	1.45E-02	1.34E-02	1.44E-02	1.51E-02	1.65E-02	1.83E-02	1.97E-02	1.85E-02	1.40E-02	1.12E-02	1.03E-02	8.55E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.97E-03	1.39E-03	9.65E-04	7.65E-04	6.48E-04	1.26E-03	2.82E-03	6.51E-03	1.08E-02	1.01E-02	8.62E-03	8.35E-03	7.23E-03	6.72E-03	7.19E-03	7.57E-03	8.23E-03	9.14E-03	9.83E-03	9.24E-03	7.01E-03	5.62E-03	5.17E-03	4.27E-03
	Emission in each Box of 1st jet	g/s	5.64E-04	3.98E-04	2.76E-04	2.19E-04	1.85E-04	3.61E-04	8.04E-04	1.86E-03	3.10E-03	2.88E-03	2.46E-03	2.38E-03	2.06E-03	1.92E-03	2.06E-03	2.16E-03	2.35E-03	2.61E-03	2.81E-03	2.64E-03	2.00E-03	1.61E-03	1.48E-03	1.22E-03
	Emission in each Box of 2nd jet	g/s	9.87E-04	6.97E-04	4.83E-04	3.83E-04	3.24E-04	6.32E-04	1.41E-03	3.26E-03	5.42E-03	5.04E-03	4.31E-03	4.17E-03	3.61E-03	3.36E-03	3.60E-03	3.78E-03	4.11E-03	4.57E-03	4.92E-03	4.62E-03	3.50E-03	2.81E-03	2.58E-03	2.14E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0005***	***0.0012***	***0.0033***	***0.0063***	***0.0059***	***0.0050***	***0.0049***	***0.0038***	***0.0035***	***0.0037***	***0.0039***	***0.0042***	***0.0047***	***0.0051***	***0.0049***	***0.0036***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.61E-04	5.94E-04	4.12E-04	3.11E-04	2.61E-04	3.61E-04	7.87E-04	2.21E-03	4.22E-03	3.93E-03	3.35E-03	3.23E-03	2.51E-03	2.30E-03	2.49E-03	2.62E-03	2.81E-03	3.13E-03	3.42E-03	3.27E-03	2.40E-03	1.83E-03	1.67E-03	1.40E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.80E-04	2.97E-04	2.06E-04	1.55E-04	1.30E-04	1.81E-04	3.94E-04	1.11E-03	2.11E-03	1.96E-03	1.68E-03	1.62E-03	1.25E-03	1.15E-03	1.25E-03	1.31E-03	1.41E-03	1.57E-03	1.71E-03	1.64E-03	1.20E-03	9.15E-04	8.33E-04	7.01E-04
	Emission in each Box of 1st jet	g/s	1.09E-04	8.49E-05	5.88E-05	4.44E-05	3.73E-05	5.16E-05	1.12E-04	3.16E-04	6.03E-04	5.61E-04	4.79E-04	4.62E-04	3.58E-04	3.29E-04	3.56E-04	3.74E-04	4.02E-04	4.48E-04	4.88E-04	4.68E-04	3.43E-04	2.61E-04	2.38E-04	2.00E-04
	Emission in each Box of 2nd jet	g/s	1.90E-04	1.49E-04	1.03E-04	7.77E-05	6.52E-05	9.03E-05	1.97E-04	5.53E-04	1.06E-03	9.82E-04	8.38E-04	8.08E-04	6.27E-04	5.75E-04	6.23E-04	6.54E-04	7.03E-04	7.84E-04	8.55E-04	8.18E-04	6.00E-04	4.57E-04	4.17E-04	3.50E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2154	0.1895	0.1925	0.2053	0.2100	0.3479	0.3687	0.3507	0.3865	0.3719	0.3512	0.3516	0.3331	0.3311	0.3313	0.3321	0.3486	0.3548	0.3560	0.3443	0.3142	0.3056	0.2950	0.2720
	NO2	g/vehicle/km	0.0419	0.0408	0.0414	0.0421	0.0426	0.0500	0.0517	0.0598	0.0755	0.0727	0.0684	0.0682	0.0579	0.0569	0.0575	0.0576	0.0598	0.0610	0.0622	0.0613	0.0542	0.0500	0.0479	0.0450
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0055***	***0.0039***	***0.0027***	***0.0022***	***0.0018***	***0.0036***	***0.0082***	***0.0195***	***0.0323***	***0.0302***	***0.0262***	***0.0251***	***0.0214***	***0.0200***	***0.0211***	***0.0222***	***0.0243***	***0.0266***	***0.0282***	***0.0262***	***0.0197***	***0.0158***	***0.0142***	***0.0115***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.63E-03	2.60E-03	1.82E-03	1.44E-03	1.22E-03	2.40E-03	5.44E-03	1.30E-02	2.16E-02	2.01E-02	1.75E-02	1.67E-02	1.43E-02	1.33E-02	1.41E-02	1.48E-02	1.62E-02	1.77E-02	1.88E-02	1.75E-02	1.31E-02	1.05E-02	9.46E-03	7.66E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.82E-03	1.30E-03	9.08E-04	7.19E-04	6.10E-04	1.20E-03	2.72E-03	6.51E-03	1.08E-02	1.01E-02	8.74E-03	8.37E-03	7.13E-03	6.65E-03	7.05E-03	7.41E-03	8.09E-03	8.87E-03	9.40E-03	8.73E-03	6.55E-03	5.25E-03	4.73E-03	3.83E-03
	Emission in each Box of 1st jet	g/s	5.19E-04	3.71E-04	2.59E-04	2.05E-04	1.74E-04	3.43E-04	7.77E-04	1.86E-03	3.08E-03	2.88E-03	2.50E-03	2.39E-03	2.04E-03	1.90E-03	2.01E-03	2.12E-03	2.31E-03	2.53E-03	2.69E-03	2.49E-03	1.87E-03	1.50E-03	1.35E-03	1.09E-03
	Emission in each Box of 2nd jet	g/s	9.09E-04	6.49E-04	4.54E-04	3.60E-04	3.05E-04	6.01E-04	1.36E-03	3.25E-03	5.39E-03	5.03E-03	4.37E-03	4.19E-03	3.57E-03	3.33E-03	3.52E-03	3.71E-03	4.05E-03	4.44E-03	4.70E-03	4.36E-03	3.28E-03	2.63E-03	2.36E-03	1.91E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0033***	***0.0063***	***0.0059***	***0.0051***	***0.0049***	***0.0037***	***0.0034***	***0.0037***	***0.0039***	***0.0042***	***0.0046***	***0.0049***	***0.0047***	***0.0034***	***0.0026***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.07E-04	5.59E-04	3.91E-04	2.95E-04	2.48E-04	3.45E-04	7.63E-04	2.22E-03	4.21E-03	3.93E-03	3.41E-03	3.25E-03	2.48E-03	2.28E-03	2.45E-03	2.57E-03	2.78E-03	3.05E-03	3.28E-03	3.11E-03	2.26E-03	1.72E-03	1.54E-03	1.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.53E-04	2.79E-04	1.95E-04	1.47E-04	1.24E-04	1.73E-04	3.81E-04	1.11E-03	2.11E-03	1.97E-03	1.70E-03	1.62E-03	1.24E-03	1.14E-03	1.22E-03	1.29E-03	1.39E-03	1.53E-03	1.64E-03	1.55E-03	1.13E-03	8.59E-04	7.68E-04	6.34E-04
	Emission in each Box of 1st jet	g/s	1.01E-04	7.98E-05	5.58E-05	4.21E-05	3.54E-05	4.93E-05	1.09E-04	3.17E-04	6.01E-04	5.62E-04	4.86E-04	4.64E-04	3.55E-04	3.26E-04	3.49E-04	3.67E-04	3.97E-04	4.36E-04	4.69E-04	4.44E-04	3.23E-04	2.45E-04	2.19E-04	1.81E-04
	Emission in each Box of 2nd jet	g/s	1.77E-04	1.40E-04	9.77E-05	7.37E-05	6.19E-05	8.63E-05	1.91E-04	5.55E-04	1.05E-03	9.83E-04	8.51E-04	8.12E-04	6.21E-04	5.71E-04	6.11E-04	6.43E-04	6.94E-04	7.63E-04	8.21E-04	7.77E-04	5.66E-04	4.29E-04	3.84E-04	3.17E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2075	0.1769	0.1769	0.1865	0.1901	0.3135	0.3274	0.3020	0.3420	0.3288	0.3141	0.3185	0.3062	0.2974	0.3053	0.3028	0.3130	0.3174	0.3196	0.3134	0.2886	0.2870	0.2793	0.2601
	NO2	g/vehicle/km	0.0404	0.0383	0.0384	0.0386	0.0390	0.0454	0.0463	0.0519	0.0673	0.0648	0.0616	0.0621	0.0536	0.0514	0.0532	0.0528	0.0540	0.0549	0.0561	0.0561	0.0501	0.0472	0.0456	0.0431
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0053***	***0.0036***	***0.0025***	***0.0020***	***0.0017***	***0.0032***	***0.0072***	***0.0168***	***0.0286***	***0.0267***	***0.0234***	***0.0227***	***0.0197***	***0.0179***	***0.0195***	***0.0203***	***0.0218***	***0.0238***	***0.0253***	***0.0238***	***0.0181***	***0.0148***	***0.0134***	***0.0110***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.50E-03	2.42E-03	1.67E-03	1.31E-03	1.11E-03	2.17E-03	4.83E-03	1.12E-02	1.91E-02	1.78E-02	1.56E-02	1.52E-02	1.31E-02	1.19E-02	1.30E-02	1.35E-02	1.45E-02	1.59E-02	1.69E-02	1.59E-02	1.20E-02	9.86E-03	8.96E-03	7.33E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.75E-03	1.21E-03	8.35E-04	6.53E-04	5.53E-04	1.08E-03	2.42E-03	5.60E-03	9.54E-03	8.90E-03	7.81E-03	7.58E-03	6.56E-03	5.97E-03	6.50E-03	6.76E-03	7.27E-03	7.94E-03	8.44E-03	7.94E-03	6.02E-03	4.93E-03	4.48E-03	3.66E-03
	Emission in each Box of 1st jet	g/s	5.00E-04	3.46E-04	2.38E-04	1.87E-04	1.58E-04	3.09E-04	6.90E-04	1.60E-03	2.72E-03	2.54E-03	2.23E-03	2.17E-03	1.87E-03	1.71E-03	1.86E-03	1.93E-03	2.08E-03	2.27E-03	2.41E-03	2.27E-03	1.72E-03	1.41E-03	1.28E-03	1.05E-03
	Emission in each Box of 2nd jet	g/s	8.75E-04	6.06E-04	4.17E-04	3.27E-04	2.76E-04	5.42E-04	1.21E-03	2.80E-03	4.77E-03	4.45E-03	3.91E-03	3.79E-03	3.28E-03	2.99E-03	3.25E-03	3.38E-03	3.63E-03	3.97E-03	4.22E-03	3.97E-03	3.01E-03	2.47E-03	2.24E-03	1.83E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0029***	***0.0056***	***0.0053***	***0.0046***	***0.0044***	***0.0034***	***0.0031***	***0.0034***	***0.0035***	***0.0038***	***0.0041***	***0.0044***	***0.0043***	***0.0031***	***0.0024***	***0.0022***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.82E-04	5.25E-04	3.62E-04	2.70E-04	2.27E-04	3.13E-04	6.83E-04	1.93E-03	3.75E-03	3.50E-03	3.07E-03	2.96E-03	2.29E-03	2.06E-03	2.27E-03	2.36E-03	2.51E-03	2.74E-03	2.97E-03	2.85E-03	2.09E-03	1.62E-03	1.46E-03	1.21E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.41E-04	2.62E-04	1.81E-04	1.35E-04	1.13E-04	1.57E-04	3.42E-04	9.64E-04	1.88E-03	1.75E-03	1.53E-03	1.48E-03	1.15E-03	1.03E-03	1.13E-03	1.18E-03	1.25E-03	1.37E-03	1.48E-03	1.42E-03	1.04E-03	8.10E-04	7.30E-04	6.07E-04
	Emission in each Box of 1st jet	g/s	9.74E-05	7.50E-05	5.17E-05	3.86E-05	3.24E-05	4.48E-05	9.76E-05	2.75E-04	5.36E-04	5.01E-04	4.38E-04	4.23E-04	3.28E-04	2.95E-04	3.24E-04	3.36E-04	3.58E-04	3.92E-04	4.24E-04	4.07E-04	2.99E-04	2.32E-04	2.09E-04	1.73E-04
	Emission in each Box of 2nd jet	g/s	1.70E-04	1.31E-04	9.05E-05	6.76E-05	5.67E-05	7.84E-05	1.71E-04	4.82E-04	9.39E-04	8.76E-04	7.66E-04	7.40E-04	5.74E-04	5.16E-04	5.66E-04	5.89E-04	6.27E-04	6.86E-04	7.41E-04	7.11E-04	5.22E-04	4.05E-04	3.65E-04	3.04E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1892	0.1676	0.1723	0.1801	0.1829	0.2995	0.3126	0.2974	0.3407	0.3239	0.3086	0.3074	0.2954	0.2981	0.3022	0.3023	0.3108	0.3216	0.3316	0.3183	0.2922	0.2877	0.2768	0.2635
	NO2	g/vehicle/km	0.0371	0.0365	0.0375	0.0374	0.0377	0.0434	0.0443	0.0512	0.0671	0.0639	0.0606	0.0600	0.0517	0.0515	0.0527	0.0527	0.0536	0.0556	0.0582	0.0569	0.0507	0.0473	0.0452	0.0437
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0048***	***0.0034***	***0.0024***	***0.0019***	***0.0016***	***0.0031***	***0.0069***	***0.0166***	***0.0285***	***0.0263***	***0.0230***	***0.0220***	***0.0190***	***0.0180***	***0.0193***	***0.0202***	***0.0216***	***0.0241***	***0.0263***	***0.0242***	***0.0183***	***0.0148***	***0.0133***	***0.0111***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.19E-03	2.30E-03	1.63E-03	1.26E-03	1.06E-03	2.07E-03	4.61E-03	1.10E-02	1.90E-02	1.75E-02	1.54E-02	1.46E-02	1.27E-02	1.20E-02	1.29E-02	1.35E-02	1.44E-02	1.61E-02	1.75E-02	1.61E-02	1.22E-02	9.89E-03	8.87E-03	7.42E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.60E-03	1.15E-03	8.13E-04	6.31E-04	5.32E-04	1.03E-03	2.31E-03	5.52E-03	9.50E-03	8.76E-03	7.68E-03	7.32E-03	6.33E-03	5.99E-03	6.43E-03	6.75E-03	7.21E-03	8.04E-03	8.76E-03	8.07E-03	6.10E-03	4.94E-03	4.44E-03	3.71E-03
	Emission in each Box of 1st jet	g/s	4.56E-04	3.28E-04	2.32E-04	1.80E-04	1.52E-04	2.96E-04	6.59E-04	1.58E-03	2.71E-03	2.50E-03	2.19E-03	2.09E-03	1.81E-03	1.71E-03	1.84E-03	1.93E-03	2.06E-03	2.30E-03	2.50E-03	2.31E-03	1.74E-03	1.41E-03	1.27E-03	1.06E-03
	Emission in each Box of 2nd jet	g/s	7.98E-04	5.74E-04	4.06E-04	3.15E-04	2.66E-04	5.17E-04	1.15E-03	2.76E-03	4.75E-03	4.38E-03	3.84E-03	3.66E-03	3.16E-03	2.99E-03	3.21E-03	3.37E-03	3.61E-03	4.02E-03	4.38E-03	4.03E-03	3.05E-03	2.47E-03	2.22E-03	1.86E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0029***	***0.0056***	***0.0052***	***0.0045***	***0.0043***	***0.0033***	***0.0031***	***0.0034***	***0.0035***	***0.0037***	***0.0042***	***0.0046***	***0.0043***	***0.0032***	***0.0024***	***0.0022***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.25E-04	5.00E-04	3.54E-04	2.62E-04	2.19E-04	3.00E-04	6.53E-04	1.90E-03	3.74E-03	3.46E-03	3.01E-03	2.86E-03	2.22E-03	2.07E-03	2.24E-03	2.35E-03	2.49E-03	2.78E-03	3.07E-03	2.89E-03	2.11E-03	1.63E-03	1.45E-03	1.23E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.13E-04	2.50E-04	1.77E-04	1.31E-04	1.09E-04	1.50E-04	3.27E-04	9.50E-04	1.87E-03	1.73E-03	1.51E-03	1.43E-03	1.11E-03	1.03E-03	1.12E-03	1.18E-03	1.24E-03	1.39E-03	1.54E-03	1.44E-03	1.06E-03	8.13E-04	7.25E-04	6.16E-04
	Emission in each Box of 1st jet	g/s	8.93E-05	7.14E-05	5.05E-05	3.74E-05	3.13E-05	4.29E-05	9.33E-05	2.72E-04	5.34E-04	4.94E-04	4.31E-04	4.08E-04	3.17E-04	2.95E-04	3.20E-04	3.36E-04	3.56E-04	3.97E-04	4.39E-04	4.12E-04	3.02E-04	2.32E-04	2.07E-04	1.76E-04
	Emission in each Box of 2nd jet	g/s	1.56E-04	1.25E-04	8.84E-05	6.55E-05	5.47E-05	7.50E-05	1.63E-04	4.75E-04	9.35E-04	8.64E-04	7.53E-04	7.15E-04	5.54E-04	5.17E-04	5.61E-04	5.88E-04	6.22E-04	6.95E-04	7.68E-04	7.22E-04	5.29E-04	4.06E-04	3.62E-04	3.08E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1850	0.1619	0.1653	0.1725	0.1726	0.2919	0.3002	0.2839	0.3231	0.3240	0.3135	0.3222	0.3062	0.3029	0.3082	0.3106	0.3081	0.3174	0.3209	0.3058	0.2734	0.2693	0.2597	0.2401
	NO2	g/vehicle/km	0.0363	0.0353	0.0360	0.0359	0.0357	0.0424	0.0426	0.0490	0.0637	0.0639	0.0615	0.0628	0.0536	0.0522	0.0538	0.0541	0.0532	0.0549	0.0563	0.0549	0.0476	0.0444	0.0425	0.0400
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0047***	***0.0033***	***0.0023***	***0.0018***	***0.0015***	***0.0030***	***0.0066***	***0.0158***	***0.0270***	***0.0263***	***0.0234***	***0.0230***	***0.0197***	***0.0183***	***0.0197***	***0.0208***	***0.0215***	***0.0238***	***0.0254***	***0.0233***	***0.0171***	***0.0139***	***0.0125***	***0.0101***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.12E-03	2.22E-03	1.56E-03	1.21E-03	1.00E-03	2.02E-03	4.43E-03	1.05E-02	1.80E-02	1.75E-02	1.56E-02	1.53E-02	1.31E-02	1.22E-02	1.31E-02	1.39E-02	1.43E-02	1.59E-02	1.69E-02	1.55E-02	1.14E-02	9.25E-03	8.33E-03	6.76E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.56E-03	1.11E-03	7.79E-04	6.04E-04	5.02E-04	1.01E-03	2.22E-03	5.27E-03	9.01E-03	8.77E-03	7.80E-03	7.67E-03	6.56E-03	6.08E-03	6.56E-03	6.93E-03	7.15E-03	7.94E-03	8.47E-03	7.75E-03	5.70E-03	4.63E-03	4.16E-03	3.38E-03
	Emission in each Box of 1st jet	g/s	4.46E-04	3.17E-04	2.23E-04	1.73E-04	1.43E-04	2.88E-04	6.33E-04	1.51E-03	2.57E-03	2.51E-03	2.23E-03	2.19E-03	1.87E-03	1.74E-03	1.87E-03	1.98E-03	2.04E-03	2.27E-03	2.42E-03	2.21E-03	1.63E-03	1.32E-03	1.19E-03	9.66E-04
	Emission in each Box of 2nd jet	g/s	7.80E-04	5.54E-04	3.90E-04	3.02E-04	2.51E-04	5.04E-04	1.11E-03	2.63E-03	4.51E-03	4.38E-03	3.90E-03	3.84E-03	3.28E-03	3.04E-03	3.28E-03	3.47E-03	3.58E-03	3.97E-03	4.24E-03	3.88E-03	2.85E-03	2.31E-03	2.08E-03	1.69E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0027***	***0.0053***	***0.0052***	***0.0046***	***0.0045***	***0.0034***	***0.0031***	***0.0034***	***0.0036***	***0.0037***	***0.0041***	***0.0045***	***0.0042***	***0.0030***	***0.0023***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.12E-04	4.83E-04	3.40E-04	2.52E-04	2.07E-04	2.93E-04	6.29E-04	1.82E-03	3.55E-03	3.46E-03	3.06E-03	2.99E-03	2.29E-03	2.10E-03	2.29E-03	2.42E-03	2.47E-03	2.74E-03	2.97E-03	2.78E-03	1.98E-03	1.53E-03	1.36E-03	1.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.06E-04	2.42E-04	1.70E-04	1.26E-04	1.04E-04	1.46E-04	3.15E-04	9.09E-04	1.78E-03	1.73E-03	1.53E-03	1.50E-03	1.15E-03	1.05E-03	1.14E-03	1.21E-03	1.23E-03	1.37E-03	1.49E-03	1.39E-03	9.92E-04	7.63E-04	6.82E-04	5.63E-04
	Emission in each Box of 1st jet	g/s	8.75E-05	6.91E-05	4.85E-05	3.59E-05	2.96E-05	4.18E-05	8.99E-05	2.60E-04	5.08E-04	4.94E-04	4.37E-04	4.27E-04	3.28E-04	3.00E-04	3.27E-04	3.45E-04	3.53E-04	3.92E-04	4.25E-04	3.97E-04	2.83E-04	2.18E-04	1.95E-04	1.61E-04
	Emission in each Box of 2nd jet	g/s	1.53E-04	1.21E-04	8.49E-05	6.29E-05	5.18E-05	7.32E-05	1.57E-04	4.54E-04	8.89E-04	8.64E-04	7.65E-04	7.48E-04	5.74E-04	5.25E-04	5.72E-04	6.04E-04	6.17E-04	6.86E-04	7.44E-04	6.95E-04	4.96E-04	3.81E-04	3.41E-04	2.82E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1955	0.1663	0.1709	0.1815	0.1829	0.2983	0.3113	0.2826	0.3262	0.3177	0.3065	0.3086	0.2978	0.3024	0.3086	0.3066	0.3287	0.3322	0.3388	0.3235	0.2865	0.2735	0.2694	0.2526
	NO2	g/vehicle/km	0.0383	0.0362	0.0372	0.0377	0.0377	0.0432	0.0441	0.0488	0.0643	0.0627	0.0602	0.0603	0.0521	0.0522	0.0539	0.0534	0.0566	0.0574	0.0593	0.0579	0.0497	0.0450	0.0440	0.0419
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0049***	***0.0034***	***0.0024***	***0.0019***	***0.0016***	***0.0031***	***0.0069***	***0.0157***	***0.0273***	***0.0258***	***0.0229***	***0.0220***	***0.0191***	***0.0182***	***0.0197***	***0.0205***	***0.0229***	***0.0249***	***0.0268***	***0.0246***	***0.0179***	***0.0141***	***0.0130***	***0.0107***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.30E-03	2.28E-03	1.61E-03	1.27E-03	1.06E-03	2.06E-03	4.59E-03	1.05E-02	1.82E-02	1.72E-02	1.52E-02	1.47E-02	1.28E-02	1.22E-02	1.31E-02	1.37E-02	1.53E-02	1.66E-02	1.79E-02	1.64E-02	1.20E-02	9.40E-03	8.64E-03	7.11E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.65E-03	1.14E-03	8.06E-04	6.36E-04	5.32E-04	1.03E-03	2.30E-03	5.24E-03	9.10E-03	8.60E-03	7.62E-03	7.35E-03	6.38E-03	6.08E-03	6.57E-03	6.84E-03	7.63E-03	8.31E-03	8.95E-03	8.20E-03	5.98E-03	4.70E-03	4.32E-03	3.56E-03
	Emission in each Box of 1st jet	g/s	4.71E-04	3.26E-04	2.30E-04	1.82E-04	1.52E-04	2.94E-04	6.56E-04	1.50E-03	2.60E-03	2.46E-03	2.18E-03	2.10E-03	1.82E-03	1.74E-03	1.88E-03	1.96E-03	2.18E-03	2.37E-03	2.56E-03	2.34E-03	1.71E-03	1.34E-03	1.23E-03	1.02E-03
	Emission in each Box of 2nd jet	g/s	8.25E-04	5.70E-04	4.03E-04	3.18E-04	2.66E-04	5.15E-04	1.15E-03	2.62E-03	4.55E-03	4.30E-03	3.81E-03	3.67E-03	3.19E-03	3.04E-03	3.28E-03	3.42E-03	3.81E-03	4.15E-03	4.47E-03	4.10E-03	2.99E-03	2.35E-03	2.16E-03	1.78E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0010***	***0.0027***	***0.0054***	***0.0051***	***0.0045***	***0.0043***	***0.0034***	***0.0031***	***0.0034***	***0.0036***	***0.0039***	***0.0043***	***0.0047***	***0.0044***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.46E-04	4.95E-04	3.51E-04	2.64E-04	2.19E-04	2.99E-04	6.51E-04	1.81E-03	3.59E-03	3.39E-03	2.99E-03	2.87E-03	2.23E-03	2.10E-03	2.29E-03	2.38E-03	2.63E-03	2.87E-03	3.14E-03	2.93E-03	2.08E-03	1.55E-03	1.41E-03	1.18E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.23E-04	2.48E-04	1.75E-04	1.32E-04	1.09E-04	1.49E-04	3.25E-04	9.05E-04	1.79E-03	1.70E-03	1.50E-03	1.43E-03	1.12E-03	1.05E-03	1.15E-03	1.19E-03	1.31E-03	1.43E-03	1.57E-03	1.47E-03	1.04E-03	7.74E-04	7.06E-04	5.91E-04
	Emission in each Box of 1st jet	g/s	9.22E-05	7.08E-05	5.01E-05	3.77E-05	3.13E-05	4.27E-05	9.30E-05	2.58E-04	5.12E-04	4.85E-04	4.28E-04	4.10E-04	3.19E-04	3.00E-04	3.27E-04	3.40E-04	3.75E-04	4.10E-04	4.48E-04	4.19E-04	2.97E-04	2.21E-04	2.02E-04	1.69E-04
	Emission in each Box of 2nd jet	g/s	1.61E-04	1.24E-04	8.77E-05	6.60E-05	5.47E-05	7.47E-05	1.63E-04	4.52E-04	8.97E-04	8.48E-04	7.49E-04	7.17E-04	5.58E-04	5.24E-04	5.73E-04	5.96E-04	6.57E-04	7.17E-04	7.84E-04	7.33E-04	5.19E-04	3.87E-04	3.53E-04	2.95E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1942	0.1699	0.1686	0.1741	0.1820	0.2905	0.3045	0.2779	0.3124	0.3038	0.3040	0.2949	0.2929	0.2939	0.3065	0.2907	0.2959	0.3146	0.3236	0.3090	0.2862	0.2760	0.2687	0.2497
	NO2	g/vehicle/km	0.0380	0.0369	0.0367	0.0362	0.0375	0.0422	0.0432	0.0480	0.0617	0.0600	0.0597	0.0577	0.0513	0.0508	0.0535	0.0508	0.0512	0.0544	0.0568	0.0554	0.0497	0.0454	0.0439	0.0415
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0049***	***0.0035***	***0.0024***	***0.0018***	***0.0016***	***0.0030***	***0.0067***	***0.0155***	***0.0261***	***0.0247***	***0.0227***	***0.0211***	***0.0188***	***0.0177***	***0.0196***	***0.0195***	***0.0206***	***0.0236***	***0.0256***	***0.0235***	***0.0179***	***0.0142***	***0.0129***	***0.0105***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.28E-03	2.33E-03	1.59E-03	1.22E-03	1.06E-03	2.01E-03	4.49E-03	1.03E-02	1.74E-02	1.64E-02	1.51E-02	1.40E-02	1.25E-02	1.18E-02	1.30E-02	1.30E-02	1.37E-02	1.57E-02	1.71E-02	1.57E-02	1.19E-02	9.48E-03	8.61E-03	7.03E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.64E-03	1.16E-03	7.95E-04	6.10E-04	5.29E-04	1.00E-03	2.25E-03	5.16E-03	8.71E-03	8.22E-03	7.56E-03	7.02E-03	6.27E-03	5.91E-03	6.52E-03	6.49E-03	6.87E-03	7.87E-03	8.55E-03	7.83E-03	5.97E-03	4.74E-03	4.31E-03	3.52E-03
	Emission in each Box of 1st jet	g/s	4.68E-04	3.33E-04	2.27E-04	1.74E-04	1.51E-04	2.87E-04	6.42E-04	1.47E-03	2.49E-03	2.35E-03	2.16E-03	2.01E-03	1.79E-03	1.69E-03	1.86E-03	1.85E-03	1.96E-03	2.25E-03	2.44E-03	2.24E-03	1.71E-03	1.35E-03	1.23E-03	1.00E-03
	Emission in each Box of 2nd jet	g/s	8.19E-04	5.82E-04	3.98E-04	3.05E-04	2.64E-04	5.02E-04	1.12E-03	2.58E-03	4.36E-03	4.11E-03	3.78E-03	3.51E-03	3.14E-03	2.95E-03	3.26E-03	3.24E-03	3.43E-03	3.93E-03	4.27E-03	3.92E-03	2.99E-03	2.37E-03	2.15E-03	1.76E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0010***	***0.0027***	***0.0052***	***0.0049***	***0.0045***	***0.0041***	***0.0033***	***0.0031***	***0.0034***	***0.0034***	***0.0036***	***0.0041***	***0.0045***	***0.0042***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.41E-04	5.06E-04	3.46E-04	2.54E-04	2.18E-04	2.92E-04	6.37E-04	1.78E-03	3.44E-03	3.25E-03	2.97E-03	2.75E-03	2.20E-03	2.04E-03	2.27E-03	2.27E-03	2.38E-03	2.72E-03	3.00E-03	2.81E-03	2.07E-03	1.56E-03	1.41E-03	1.17E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.21E-04	2.53E-04	1.73E-04	1.27E-04	1.09E-04	1.46E-04	3.19E-04	8.90E-04	1.72E-03	1.62E-03	1.48E-03	1.37E-03	1.10E-03	1.02E-03	1.14E-03	1.13E-03	1.19E-03	1.36E-03	1.50E-03	1.40E-03	1.04E-03	7.81E-04	7.04E-04	5.85E-04
	Emission in each Box of 1st jet	g/s	9.16E-05	7.23E-05	4.95E-05	3.62E-05	3.11E-05	4.16E-05	9.11E-05	2.54E-04	4.92E-04	4.64E-04	4.24E-04	3.92E-04	3.14E-04	2.91E-04	3.25E-04	3.24E-04	3.40E-04	3.89E-04	4.28E-04	4.01E-04	2.96E-04	2.23E-04	2.01E-04	1.67E-04
	Emission in each Box of 2nd jet	g/s	1.60E-04	1.27E-04	8.66E-05	6.34E-05	5.44E-05	7.29E-05	1.59E-04	4.45E-04	8.61E-04	8.12E-04	7.42E-04	6.87E-04	5.49E-04	5.10E-04	5.69E-04	5.67E-04	5.94E-04	6.80E-04	7.50E-04	7.02E-04	5.18E-04	3.90E-04	3.52E-04	2.92E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2210	0.1958	0.1955	0.2053	0.2101	0.3500	0.3633	0.3318	0.3713	0.3570	0.3395	0.3448	0.3344	0.3283	0.3302	0.3344	0.3413	0.3530	0.3629	0.3492	0.3216	0.3103	0.3048	0.2885
	NO2	g/vehicle/km	0.0428	0.0419	0.0419	0.0420	0.0426	0.0502	0.0510	0.0566	0.0726	0.0699	0.0662	0.0669	0.0581	0.0563	0.0573	0.0579	0.0586	0.0607	0.0632	0.0621	0.0554	0.0507	0.0494	0.0475
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0056***	***0.0040***	***0.0028***	***0.0022***	***0.0018***	***0.0036***	***0.0080***	***0.0185***	***0.0311***	***0.0290***	***0.0253***	***0.0246***	***0.0215***	***0.0198***	***0.0211***	***0.0224***	***0.0238***	***0.0265***	***0.0288***	***0.0266***	***0.0201***	***0.0160***	***0.0147***	***0.0122***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.73E-03	2.68E-03	1.84E-03	1.44E-03	1.22E-03	2.42E-03	5.36E-03	1.23E-02	2.07E-02	1.93E-02	1.69E-02	1.64E-02	1.43E-02	1.32E-02	1.41E-02	1.49E-02	1.58E-02	1.77E-02	1.92E-02	1.77E-02	1.34E-02	1.07E-02	9.77E-03	8.12E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.86E-03	1.34E-03	9.22E-04	7.19E-04	6.11E-04	1.21E-03	2.68E-03	6.16E-03	1.04E-02	9.66E-03	8.44E-03	8.21E-03	7.16E-03	6.59E-03	7.03E-03	7.46E-03	7.92E-03	8.83E-03	9.58E-03	8.85E-03	6.71E-03	5.33E-03	4.89E-03	4.06E-03
	Emission in each Box of 1st jet	g/s	5.33E-04	3.83E-04	2.63E-04	2.05E-04	1.74E-04	3.45E-04	7.66E-04	1.76E-03	2.96E-03	2.76E-03	2.41E-03	2.35E-03	2.05E-03	1.88E-03	2.01E-03	2.13E-03	2.26E-03	2.52E-03	2.74E-03	2.53E-03	1.92E-03	1.52E-03	1.40E-03	1.16E-03
	Emission in each Box of 2nd jet	g/s	9.32E-04	6.71E-04	4.61E-04	3.60E-04	3.05E-04	6.04E-04	1.34E-03	3.08E-03	5.18E-03	4.83E-03	4.22E-03	4.10E-03	3.58E-03	3.30E-03	3.51E-03	3.73E-03	3.96E-03	4.41E-03	4.79E-03	4.43E-03	3.35E-03	2.67E-03	2.44E-03	2.03E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0032***	***0.0061***	***0.0057***	***0.0049***	***0.0048***	***0.0037***	***0.0034***	***0.0037***	***0.0039***	***0.0041***	***0.0046***	***0.0050***	***0.0047***	***0.0035***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.22E-04	5.74E-04	3.96E-04	2.95E-04	2.47E-04	3.47E-04	7.52E-04	2.10E-03	4.05E-03	3.78E-03	3.29E-03	3.19E-03	2.49E-03	2.26E-03	2.44E-03	2.59E-03	2.72E-03	3.03E-03	3.34E-03	3.15E-03	2.31E-03	1.74E-03	1.58E-03	1.34E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.61E-04	2.87E-04	1.98E-04	1.47E-04	1.24E-04	1.73E-04	3.76E-04	1.05E-03	2.03E-03	1.89E-03	1.65E-03	1.59E-03	1.24E-03	1.13E-03	1.22E-03	1.29E-03	1.36E-03	1.52E-03	1.67E-03	1.57E-03	1.16E-03	8.71E-04	7.91E-04	6.69E-04
	Emission in each Box of 1st jet	g/s	1.03E-04	8.20E-05	5.65E-05	4.21E-05	3.53E-05	4.95E-05	1.07E-04	3.00E-04	5.79E-04	5.40E-04	4.71E-04	4.55E-04	3.56E-04	3.23E-04	3.48E-04	3.69E-04	3.88E-04	4.34E-04	4.77E-04	4.50E-04	3.30E-04	2.49E-04	2.26E-04	1.91E-04
	Emission in each Box of 2nd jet	g/s	1.80E-04	1.44E-04	9.89E-05	7.36E-05	6.19E-05	8.67E-05	1.88E-04	5.25E-04	1.01E-03	9.45E-04	8.24E-04	7.96E-04	6.22E-04	5.66E-04	6.10E-04	6.47E-04	6.80E-04	7.59E-04	8.35E-04	7.87E-04	5.78E-04	4.36E-04	3.96E-04	3.34E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2417	0.2100	0.2127	0.2246	0.2293	0.3787	0.3971	0.3587	0.4013	0.3845	0.3668	0.3671	0.3583	0.3550	0.3589	0.3575	0.3659	0.3762	0.3866	0.3786	0.3446	0.3387	0.3308	0.3115
	NO2	g/vehicle/km	0.0464	0.0447	0.0452	0.0456	0.0461	0.0541	0.0554	0.0610	0.0779	0.0748	0.0711	0.0708	0.0618	0.0604	0.0618	0.0615	0.0624	0.0643	0.0670	0.0669	0.0590	0.0549	0.0532	0.0509
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0061***	***0.0043***	***0.0030***	***0.0024***	***0.0020***	***0.0039***	***0.0088***	***0.0200***	***0.0336***	***0.0312***	***0.0274***	***0.0262***	***0.0230***	***0.0214***	***0.0229***	***0.0239***	***0.0255***	***0.0282***	***0.0306***	***0.0288***	***0.0216***	***0.0175***	***0.0159***	***0.0132***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.08E-03	2.88E-03	2.01E-03	1.57E-03	1.33E-03	2.62E-03	5.86E-03	1.33E-02	2.24E-02	2.08E-02	1.82E-02	1.75E-02	1.54E-02	1.43E-02	1.53E-02	1.60E-02	1.70E-02	1.88E-02	2.04E-02	1.92E-02	1.44E-02	1.16E-02	1.06E-02	8.77E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.04E-03	1.44E-03	1.00E-03	7.87E-04	6.67E-04	1.31E-03	2.93E-03	6.66E-03	1.12E-02	1.04E-02	9.12E-03	8.74E-03	7.68E-03	7.13E-03	7.63E-03	7.98E-03	8.49E-03	9.41E-03	1.02E-02	9.60E-03	7.19E-03	5.82E-03	5.30E-03	4.39E-03
	Emission in each Box of 1st jet	g/s	5.82E-04	4.11E-04	2.87E-04	2.25E-04	1.90E-04	3.74E-04	8.37E-04	1.90E-03	3.20E-03	2.97E-03	2.61E-03	2.50E-03	2.19E-03	2.04E-03	2.18E-03	2.28E-03	2.43E-03	2.69E-03	2.92E-03	2.74E-03	2.05E-03	1.66E-03	1.52E-03	1.25E-03
	Emission in each Box of 2nd jet	g/s	1.02E-03	7.19E-04	5.02E-04	3.93E-04	3.33E-04	6.54E-04	1.46E-03	3.33E-03	5.60E-03	5.20E-03	4.56E-03	4.37E-03	3.84E-03	3.57E-03	3.82E-03	3.99E-03	4.25E-03	4.70E-03	5.11E-03	4.80E-03	3.59E-03	2.91E-03	2.65E-03	2.19E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0034***	***0.0065***	***0.0061***	***0.0053***	***0.0051***	***0.0040***	***0.0036***	***0.0039***	***0.0041***	***0.0043***	***0.0048***	***0.0053***	***0.0051***	***0.0037***	***0.0028***	***0.0026***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.83E-04	6.13E-04	4.27E-04	3.19E-04	2.68E-04	3.74E-04	8.18E-04	2.26E-03	4.35E-03	4.05E-03	3.54E-03	3.37E-03	2.65E-03	2.43E-03	2.63E-03	2.75E-03	2.90E-03	3.22E-03	3.54E-03	3.39E-03	2.46E-03	1.89E-03	1.71E-03	1.43E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.92E-04	3.07E-04	2.13E-04	1.60E-04	1.34E-04	1.87E-04	4.09E-04	1.13E-03	2.17E-03	2.02E-03	1.77E-03	1.69E-03	1.32E-03	1.21E-03	1.32E-03	1.37E-03	1.45E-03	1.61E-03	1.77E-03	1.69E-03	1.23E-03	9.43E-04	8.53E-04	7.17E-04
	Emission in each Box of 1st jet	g/s	1.12E-04	8.76E-05	6.09E-05	4.56E-05	3.83E-05	5.34E-05	1.17E-04	3.23E-04	6.21E-04	5.79E-04	5.05E-04	4.82E-04	3.78E-04	3.47E-04	3.76E-04	3.92E-04	4.14E-04	4.59E-04	5.06E-04	4.84E-04	3.52E-04	2.70E-04	2.44E-04	2.05E-04
	Emission in each Box of 2nd jet	g/s	1.96E-04	1.53E-04	1.07E-04	7.98E-05	6.70E-05	9.34E-05	2.04E-04	5.66E-04	1.09E-03	1.01E-03	8.84E-04	8.43E-04	6.62E-04	6.07E-04	6.58E-04	6.87E-04	7.24E-04	8.04E-04	8.85E-04	8.47E-04	6.15E-04	4.72E-04	4.27E-04	3.58E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2511	0.2195	0.2224	0.2352	0.2390	0.3906	0.4095	0.3719	0.4131	0.3955	0.3771	0.3802	0.3693	0.3641	0.3683	0.3678	0.3788	0.3933	0.3994	0.3907	0.3565	0.3500	0.3425	0.3237
	NO2	g/vehicle/km	0.0479	0.0462	0.0467	0.0471	0.0475	0.0554	0.0568	0.0627	0.0798	0.0765	0.0726	0.0729	0.0633	0.0617	0.0631	0.0630	0.0642	0.0668	0.0688	0.0686	0.0606	0.0564	0.0547	0.0526
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0064***	***0.0045***	***0.0031***	***0.0025***	***0.0021***	***0.0040***	***0.0091***	***0.0207***	***0.0346***	***0.0321***	***0.0281***	***0.0272***	***0.0237***	***0.0219***	***0.0235***	***0.0246***	***0.0264***	***0.0295***	***0.0316***	***0.0297***	***0.0223***	***0.0180***	***0.0165***	***0.0137***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.24E-03	3.01E-03	2.10E-03	1.65E-03	1.39E-03	2.70E-03	6.04E-03	1.38E-02	2.30E-02	2.14E-02	1.88E-02	1.81E-02	1.58E-02	1.46E-02	1.57E-02	1.64E-02	1.76E-02	1.97E-02	2.11E-02	1.98E-02	1.49E-02	1.20E-02	1.10E-02	9.12E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.12E-03	1.50E-03	1.05E-03	8.24E-04	6.95E-04	1.35E-03	3.02E-03	6.90E-03	1.15E-02	1.07E-02	9.38E-03	9.05E-03	7.91E-03	7.31E-03	7.83E-03	8.21E-03	8.79E-03	9.83E-03	1.05E-02	9.90E-03	7.44E-03	6.01E-03	5.49E-03	4.56E-03
	Emission in each Box of 1st jet	g/s	6.05E-04	4.30E-04	3.00E-04	2.35E-04	1.98E-04	3.86E-04	8.63E-04	1.97E-03	3.29E-03	3.06E-03	2.68E-03	2.59E-03	2.26E-03	2.09E-03	2.24E-03	2.35E-03	2.51E-03	2.81E-03	3.01E-03	2.83E-03	2.13E-03	1.72E-03	1.57E-03	1.30E-03
	Emission in each Box of 2nd jet	g/s	1.06E-03	7.52E-04	5.24E-04	4.12E-04	3.47E-04	6.75E-04	1.51E-03	3.45E-03	5.76E-03	5.35E-03	4.69E-03	4.53E-03	3.95E-03	3.66E-03	3.92E-03	4.10E-03	4.40E-03	4.92E-03	5.27E-03	4.95E-03	3.72E-03	3.01E-03	2.75E-03	2.28E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0035***	***0.0067***	***0.0062***	***0.0054***	***0.0052***	***0.0041***	***0.0037***	***0.0040***	***0.0042***	***0.0045***	***0.0050***	***0.0055***	***0.0052***	***0.0038***	***0.0029***	***0.0026***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.07E-04	6.33E-04	4.41E-04	3.30E-04	2.76E-04	3.83E-04	8.38E-04	2.33E-03	4.45E-03	4.14E-03	3.61E-03	3.47E-03	2.71E-03	2.48E-03	2.69E-03	2.81E-03	2.98E-03	3.34E-03	3.64E-03	3.48E-03	2.53E-03	1.94E-03	1.76E-03	1.48E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.04E-04	3.17E-04	2.20E-04	1.65E-04	1.38E-04	1.91E-04	4.19E-04	1.16E-03	2.23E-03	2.07E-03	1.81E-03	1.73E-03	1.36E-03	1.24E-03	1.34E-03	1.41E-03	1.49E-03	1.67E-03	1.82E-03	1.74E-03	1.26E-03	9.70E-04	8.78E-04	7.40E-04
	Emission in each Box of 1st jet	g/s	1.15E-04	9.05E-05	6.29E-05	4.72E-05	3.95E-05	5.47E-05	1.20E-04	3.33E-04	6.36E-04	5.91E-04	5.16E-04	4.96E-04	3.88E-04	3.54E-04	3.84E-04	4.02E-04	4.26E-04	4.77E-04	5.19E-04	4.97E-04	3.61E-04	2.77E-04	2.51E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	2.02E-04	1.58E-04	1.10E-04	8.26E-05	6.90E-05	9.57E-05	2.09E-04	5.82E-04	1.11E-03	1.03E-03	9.03E-04	8.67E-04	6.78E-04	6.19E-04	6.71E-04	7.03E-04	7.45E-04	8.35E-04	9.09E-04	8.70E-04	6.32E-04	4.85E-04	4.39E-04	3.70E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2539	0.2236	0.2256	0.2392	0.2425	0.3955	0.4137	0.3775	0.4180	0.3998	0.3793	0.3849	0.3728	0.3691	0.3737	0.3733	0.3886	0.4017	0.4082	0.3979	0.3643	0.3576	0.3464	0.3252
	NO2	g/vehicle/km	0.0482	0.0469	0.0472	0.0477	0.0480	0.0559	0.0573	0.0635	0.0805	0.0772	0.0729	0.0736	0.0637	0.0623	0.0638	0.0636	0.0656	0.0680	0.0701	0.0697	0.0617	0.0574	0.0552	0.0527
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0139***	***0.0099***	***0.0069***	***0.0054***	***0.0046***	***0.0089***	***0.0198***	***0.0455***	***0.0757***	***0.0703***	***0.0613***	***0.0595***	***0.0519***	***0.0482***	***0.0516***	***0.0541***	***0.0586***	***0.0652***	***0.0700***	***0.0655***	***0.0494***	***0.0399***	***0.0361***	***0.0297***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.27E-03	6.63E-03	4.61E-03	3.63E-03	3.05E-03	5.92E-03	1.32E-02	3.03E-02	5.05E-02	4.68E-02	4.09E-02	3.97E-02	3.46E-02	3.21E-02	3.44E-02	3.61E-02	3.91E-02	4.35E-02	4.67E-02	4.37E-02	3.29E-02	2.66E-02	2.40E-02	1.98E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.64E-03	3.32E-03	2.30E-03	1.81E-03	1.53E-03	2.96E-03	6.61E-03	1.52E-02	2.52E-02	2.34E-02	2.04E-02	1.98E-02	1.73E-02	1.61E-02	1.72E-02	1.80E-02	1.95E-02	2.17E-02	2.33E-02	2.18E-02	1.65E-02	1.33E-02	1.20E-02	9.92E-03
	Emission in each Box of 1st jet	g/s	1.16E-03	8.29E-04	5.76E-04	4.53E-04	3.81E-04	7.39E-04	1.65E-03	3.79E-03	6.31E-03	5.86E-03	5.11E-03	4.96E-03	4.32E-03	4.01E-03	4.30E-03	4.51E-03	4.88E-03	5.44E-03	5.84E-03	5.46E-03	4.11E-03	3.33E-03	3.01E-03	2.48E-03
	Emission in each Box of 2nd jet	g/s	6.62E-04	4.74E-04	3.29E-04	2.59E-04	2.18E-04	4.23E-04	9.44E-04	2.17E-03	3.61E-03	3.35E-03	2.92E-03	2.83E-03	2.47E-03	2.29E-03	2.46E-03	2.58E-03	2.79E-03	3.11E-03	3.33E-03	3.12E-03	2.35E-03	1.90E-03	1.72E-03	1.42E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0021***	***0.0014***	***0.0011***	***0.0009***	***0.0013***	***0.0027***	***0.0077***	***0.0146***	***0.0136***	***0.0118***	***0.0114***	***0.0089***	***0.0081***	***0.0088***	***0.0092***	***0.0099***	***0.0110***	***0.0120***	***0.0115***	***0.0084***	***0.0064***	***0.0057***	***0.0048***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.76E-03	1.39E-03	9.65E-04	7.24E-04	6.04E-04	8.37E-04	1.83E-03	5.10E-03	9.72E-03	9.04E-03	7.86E-03	7.59E-03	5.91E-03	5.42E-03	5.87E-03	6.15E-03	6.59E-03	7.36E-03	8.02E-03	7.64E-03	5.57E-03	4.27E-03	3.83E-03	3.21E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.81E-04	6.95E-04	4.82E-04	3.62E-04	3.02E-04	4.18E-04	9.15E-04	2.55E-03	4.86E-03	4.52E-03	3.93E-03	3.79E-03	2.96E-03	2.71E-03	2.94E-03	3.07E-03	3.29E-03	3.68E-03	4.01E-03	3.82E-03	2.79E-03	2.13E-03	1.92E-03	1.61E-03
	Emission in each Box of 1st jet	g/s	2.20E-04	1.74E-04	1.21E-04	9.05E-05	7.55E-05	1.05E-04	2.29E-04	6.38E-04	1.22E-03	1.13E-03	9.82E-04	9.49E-04	7.39E-04	6.78E-04	7.34E-04	7.69E-04	8.24E-04	9.20E-04	1.00E-03	9.56E-04	6.97E-04	5.33E-04	4.79E-04	4.02E-04
	Emission in each Box of 2nd jet	g/s	1.26E-04	9.93E-05	6.89E-05	5.17E-05	4.31E-05	5.98E-05	1.31E-04	3.64E-04	6.95E-04	6.46E-04	5.61E-04	5.42E-04	4.22E-04	3.87E-04	4.19E-04	4.39E-04	4.71E-04	5.26E-04	5.73E-04	5.46E-04	3.98E-04	3.05E-04	2.74E-04	2.29E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2319	0.2036	0.2045	0.2179	0.2272	0.3749	0.3939	0.3565	0.3956	0.3832	0.3648	0.3683	0.3552	0.3474	0.3541	0.3547	0.3690	0.3772	0.3741	0.3642	0.3316	0.3264	0.3165	0.2967
	NO2	g/vehicle/km	0.0446	0.0433	0.0435	0.0442	0.0456	0.0535	0.0549	0.0605	0.0770	0.0745	0.0706	0.0710	0.0612	0.0592	0.0610	0.0610	0.0628	0.0643	0.0649	0.0644	0.0568	0.0530	0.0510	0.0487
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0127***	***0.0091***	***0.0063***	***0.0050***	***0.0043***	***0.0084***	***0.0189***	***0.0430***	***0.0717***	***0.0673***	***0.0589***	***0.0570***	***0.0494***	***0.0453***	***0.0489***	***0.0514***	***0.0556***	***0.0612***	***0.0642***	***0.0600***	***0.0449***	***0.0364***	***0.0329***	***0.0271***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.47E-03	6.04E-03	4.18E-03	3.31E-03	2.86E-03	5.61E-03	1.26E-02	2.86E-02	4.78E-02	4.49E-02	3.93E-02	3.80E-02	3.29E-02	3.02E-02	3.26E-02	3.43E-02	3.71E-02	4.08E-02	4.28E-02	4.00E-02	3.00E-02	2.43E-02	2.20E-02	1.81E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.24E-03	3.02E-03	2.09E-03	1.65E-03	1.43E-03	2.80E-03	6.29E-03	1.43E-02	2.39E-02	2.24E-02	1.96E-02	1.90E-02	1.65E-02	1.51E-02	1.63E-02	1.71E-02	1.85E-02	2.04E-02	2.14E-02	2.00E-02	1.50E-02	1.21E-02	1.10E-02	9.05E-03
	Emission in each Box of 1st jet	g/s	1.06E-03	7.55E-04	5.22E-04	4.13E-04	3.57E-04	7.01E-04	1.57E-03	3.58E-03	5.97E-03	5.61E-03	4.91E-03	4.75E-03	4.12E-03	3.78E-03	4.08E-03	4.29E-03	4.64E-03	5.10E-03	5.35E-03	5.00E-03	3.74E-03	3.04E-03	2.75E-03	2.26E-03
	Emission in each Box of 2nd jet	g/s	6.05E-04	4.31E-04	2.98E-04	2.36E-04	2.04E-04	4.01E-04	8.99E-04	2.05E-03	3.41E-03	3.21E-03	2.81E-03	2.71E-03	2.35E-03	2.16E-03	2.33E-03	2.45E-03	2.65E-03	2.92E-03	3.06E-03	2.86E-03	2.14E-03	1.73E-03	1.57E-03	1.29E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0009***	***0.0012***	***0.0026***	***0.0073***	***0.0139***	***0.0131***	***0.0114***	***0.0110***	***0.0085***	***0.0077***	***0.0084***	***0.0088***	***0.0095***	***0.0104***	***0.0111***	***0.0106***	***0.0077***	***0.0059***	***0.0053***	***0.0044***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.63E-03	1.28E-03	8.88E-04	6.70E-04	5.74E-04	8.00E-04	1.75E-03	4.86E-03	9.30E-03	8.73E-03	7.61E-03	7.32E-03	5.68E-03	5.15E-03	5.62E-03	5.90E-03	6.31E-03	6.96E-03	7.42E-03	7.07E-03	5.13E-03	3.94E-03	3.54E-03	2.97E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.15E-04	6.42E-04	4.44E-04	3.35E-04	2.87E-04	4.00E-04	8.77E-04	2.43E-03	4.65E-03	4.36E-03	3.80E-03	3.66E-03	2.84E-03	2.58E-03	2.81E-03	2.95E-03	3.15E-03	3.48E-03	3.71E-03	3.54E-03	2.57E-03	1.97E-03	1.77E-03	1.48E-03
	Emission in each Box of 1st jet	g/s	2.04E-04	1.61E-04	1.11E-04	8.38E-05	7.18E-05	1.00E-04	2.19E-04	6.08E-04	1.16E-03	1.09E-03	9.51E-04	9.15E-04	7.10E-04	6.44E-04	7.02E-04	7.37E-04	7.89E-04	8.70E-04	9.28E-04	8.84E-04	6.41E-04	4.93E-04	4.43E-04	3.71E-04
	Emission in each Box of 2nd jet	g/s	1.16E-04	9.17E-05	6.35E-05	4.79E-05	4.10E-05	5.72E-05	1.25E-04	3.47E-04	6.64E-04	6.24E-04	5.43E-04	5.23E-04	4.06E-04	3.68E-04	4.01E-04	4.21E-04	4.51E-04	4.97E-04	5.30E-04	5.05E-04	3.67E-04	2.82E-04	2.53E-04	2.12E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2341	0.2034	0.2046	0.2184	0.2230	0.3659	0.3816	0.3510	0.3885	0.3722	0.3464	0.3506	0.3374	0.3345	0.3382	0.3390	0.3545	0.3658	0.3722	0.3646	0.3359	0.3273	0.3225	0.3035
	NO2	g/vehicle/km	0.0451	0.0434	0.0436	0.0443	0.0449	0.0523	0.0533	0.0597	0.0757	0.0726	0.0674	0.0679	0.0585	0.0573	0.0586	0.0586	0.0606	0.0627	0.0647	0.0646	0.0575	0.0532	0.0520	0.0498
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0128***	***0.0090***	***0.0063***	***0.0050***	***0.0042***	***0.0082***	***0.0183***	***0.0423***	***0.0704***	***0.0654***	***0.0560***	***0.0542***	***0.0469***	***0.0436***	***0.0467***	***0.0492***	***0.0534***	***0.0594***	***0.0638***	***0.0600***	***0.0455***	***0.0365***	***0.0336***	***0.0278***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.55E-03	6.03E-03	4.18E-03	3.31E-03	2.81E-03	5.47E-03	1.22E-02	2.82E-02	4.69E-02	4.36E-02	3.73E-02	3.61E-02	3.13E-02	2.91E-02	3.12E-02	3.28E-02	3.56E-02	3.96E-02	4.26E-02	4.00E-02	3.03E-02	2.44E-02	2.24E-02	1.85E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.27E-03	3.02E-03	2.09E-03	1.66E-03	1.40E-03	2.74E-03	6.09E-03	1.41E-02	2.35E-02	2.18E-02	1.87E-02	1.81E-02	1.56E-02	1.45E-02	1.56E-02	1.64E-02	1.78E-02	1.98E-02	2.13E-02	2.00E-02	1.52E-02	1.22E-02	1.12E-02	9.25E-03
	Emission in each Box of 1st jet	g/s	1.07E-03	7.54E-04	5.22E-04	4.14E-04	3.51E-04	6.84E-04	1.52E-03	3.52E-03	5.86E-03	5.45E-03	4.66E-03	4.52E-03	3.91E-03	3.64E-03	3.89E-03	4.10E-03	4.45E-03	4.95E-03	5.32E-03	5.00E-03	3.79E-03	3.04E-03	2.80E-03	2.31E-03
	Emission in each Box of 2nd jet	g/s	6.11E-04	4.31E-04	2.98E-04	2.37E-04	2.00E-04	3.91E-04	8.71E-04	2.01E-03	3.35E-03	3.11E-03	2.66E-03	2.58E-03	2.24E-03	2.08E-03	2.23E-03	2.34E-03	2.54E-03	2.83E-03	3.04E-03	2.86E-03	2.17E-03	1.74E-03	1.60E-03	1.32E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0012***	***0.0026***	***0.0072***	***0.0137***	***0.0128***	***0.0109***	***0.0105***	***0.0081***	***0.0075***	***0.0081***	***0.0085***	***0.0091***	***0.0102***	***0.0111***	***0.0106***	***0.0078***	***0.0059***	***0.0054***	***0.0046***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.65E-03	1.29E-03	8.91E-04	6.73E-04	5.65E-04	7.82E-04	1.70E-03	4.79E-03	9.14E-03	8.50E-03	7.26E-03	7.00E-03	5.43E-03	4.98E-03	5.39E-03	5.66E-03	6.09E-03	6.79E-03	7.40E-03	7.09E-03	5.20E-03	3.96E-03	3.61E-03	3.03E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.23E-04	6.43E-04	4.46E-04	3.36E-04	2.82E-04	3.91E-04	8.52E-04	2.40E-03	4.57E-03	4.25E-03	3.63E-03	3.50E-03	2.71E-03	2.49E-03	2.70E-03	2.83E-03	3.04E-03	3.39E-03	3.70E-03	3.54E-03	2.60E-03	1.98E-03	1.80E-03	1.52E-03
	Emission in each Box of 1st jet	g/s	2.06E-04	1.61E-04	1.11E-04	8.41E-05	7.06E-05	9.77E-05	2.13E-04	5.99E-04	1.14E-03	1.06E-03	9.07E-04	8.75E-04	6.79E-04	6.23E-04	6.74E-04	7.08E-04	7.61E-04	8.48E-04	9.25E-04	8.86E-04	6.50E-04	4.95E-04	4.51E-04	3.79E-04
	Emission in each Box of 2nd jet	g/s	1.18E-04	9.19E-05	6.37E-05	4.80E-05	4.04E-05	5.59E-05	1.22E-04	3.42E-04	6.53E-04	6.07E-04	5.18E-04	5.00E-04	3.88E-04	3.56E-04	3.85E-04	4.05E-04	4.35E-04	4.85E-04	5.29E-04	5.06E-04	3.71E-04	2.83E-04	2.58E-04	2.17E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2154	0.1895	0.1925	0.2053	0.2100	0.3479	0.3687	0.3507	0.3865	0.3719	0.3512	0.3516	0.3331	0.3311	0.3313	0.3321	0.3486	0.3548	0.3560	0.3443	0.3142	0.3056	0.2950	0.2720
	NO2	g/vehicle/km	0.0419	0.0408	0.0414	0.0421	0.0426	0.0500	0.0517	0.0598	0.0755	0.0727	0.0684	0.0682	0.0579	0.0569	0.0575	0.0576	0.0598	0.0610	0.0622	0.0613	0.0542	0.0500	0.0479	0.0450
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0118***	***0.0084***	***0.0059***	***0.0047***	***0.0040***	***0.0078***	***0.0177***	***0.0423***	***0.0700***	***0.0654***	***0.0567***	***0.0544***	***0.0463***	***0.0432***	***0.0458***	***0.0482***	***0.0525***	***0.0576***	***0.0611***	***0.0567***	***0.0426***	***0.0341***	***0.0307***	***0.0249***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.87E-03	5.62E-03	3.93E-03	3.11E-03	2.64E-03	5.20E-03	1.18E-02	2.82E-02	4.67E-02	4.36E-02	3.78E-02	3.62E-02	3.09E-02	2.88E-02	3.05E-02	3.21E-02	3.50E-02	3.84E-02	4.07E-02	3.78E-02	2.84E-02	2.27E-02	2.05E-02	1.66E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.93E-03	2.81E-03	1.97E-03	1.56E-03	1.32E-03	2.60E-03	5.89E-03	1.41E-02	2.33E-02	2.18E-02	1.89E-02	1.81E-02	1.54E-02	1.44E-02	1.53E-02	1.61E-02	1.75E-02	1.92E-02	2.04E-02	1.89E-02	1.42E-02	1.14E-02	1.02E-02	8.29E-03
	Emission in each Box of 1st jet	g/s	9.83E-04	7.03E-04	4.91E-04	3.89E-04	3.30E-04	6.50E-04	1.47E-03	3.52E-03	5.83E-03	5.45E-03	4.73E-03	4.53E-03	3.86E-03	3.60E-03	3.81E-03	4.01E-03	4.38E-03	4.80E-03	5.09E-03	4.72E-03	3.55E-03	2.84E-03	2.56E-03	2.07E-03
	Emission in each Box of 2nd jet	g/s	5.62E-04	4.01E-04	2.81E-04	2.22E-04	1.89E-04	3.72E-04	8.41E-04	2.01E-03	3.33E-03	3.11E-03	2.70E-03	2.59E-03	2.21E-03	2.06E-03	2.18E-03	2.29E-03	2.50E-03	2.74E-03	2.91E-03	2.70E-03	2.03E-03	1.62E-03	1.46E-03	1.18E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0013***	***0.0010***	***0.0008***	***0.0011***	***0.0025***	***0.0072***	***0.0137***	***0.0128***	***0.0111***	***0.0105***	***0.0081***	***0.0074***	***0.0079***	***0.0084***	***0.0090***	***0.0099***	***0.0107***	***0.0101***	***0.0073***	***0.0056***	***0.0050***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.53E-03	1.21E-03	8.46E-04	6.39E-04	5.36E-04	7.47E-04	1.65E-03	4.80E-03	9.11E-03	8.52E-03	7.37E-03	7.03E-03	5.37E-03	4.95E-03	5.29E-03	5.57E-03	6.01E-03	6.61E-03	7.11E-03	6.73E-03	4.90E-03	3.72E-03	3.33E-03	2.74E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.65E-04	6.05E-04	4.23E-04	3.19E-04	2.68E-04	3.74E-04	8.26E-04	2.40E-03	4.56E-03	4.26E-03	3.69E-03	3.52E-03	2.69E-03	2.47E-03	2.65E-03	2.78E-03	3.00E-03	3.30E-03	3.56E-03	3.36E-03	2.45E-03	1.86E-03	1.66E-03	1.37E-03
	Emission in each Box of 1st jet	g/s	1.91E-04	1.51E-04	1.06E-04	7.98E-05	6.71E-05	9.34E-05	2.06E-04	6.00E-04	1.14E-03	1.06E-03	9.22E-04	8.79E-04	6.72E-04	6.18E-04	6.62E-04	6.96E-04	7.51E-04	8.26E-04	8.89E-04	8.41E-04	6.12E-04	4.65E-04	4.16E-04	3.43E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	8.64E-05	6.04E-05	4.56E-05	3.83E-05	5.34E-05	1.18E-04	3.43E-04	6.51E-04	6.08E-04	5.27E-04	5.02E-04	3.84E-04	3.53E-04	3.78E-04	3.98E-04	4.29E-04	4.72E-04	5.08E-04	4.81E-04	3.50E-04	2.66E-04	2.38E-04	1.96E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2075	0.1769	0.1769	0.1865	0.1901	0.3135	0.3274	0.3020	0.3420	0.3288	0.3141	0.3185	0.3062	0.2974	0.3053	0.3028	0.3130	0.3174	0.3196	0.3134	0.2886	0.2870	0.2793	0.2601
	NO2	g/vehicle/km	0.0404	0.0383	0.0384	0.0386	0.0390	0.0454	0.0463	0.0519	0.0673	0.0648	0.0616	0.0621	0.0536	0.0514	0.0532	0.0528	0.0540	0.0549	0.0561	0.0561	0.0501	0.0472	0.0456	0.0431
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0114***	***0.0079***	***0.0054***	***0.0042***	***0.0036***	***0.0070***	***0.0157***	***0.0364***	***0.0619***	***0.0578***	***0.0508***	***0.0492***	***0.0426***	***0.0388***	***0.0422***	***0.0439***	***0.0472***	***0.0515***	***0.0548***	***0.0516***	***0.0391***	***0.0320***	***0.0291***	***0.0238***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.58E-03	5.25E-03	3.61E-03	2.83E-03	2.39E-03	4.69E-03	1.05E-02	2.43E-02	4.13E-02	3.85E-02	3.38E-02	3.28E-02	2.84E-02	2.59E-02	2.81E-02	2.93E-02	3.15E-02	3.44E-02	3.66E-02	3.44E-02	2.61E-02	2.14E-02	1.94E-02	1.59E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.79E-03	2.62E-03	1.81E-03	1.41E-03	1.20E-03	2.34E-03	5.23E-03	1.21E-02	2.06E-02	1.93E-02	1.69E-02	1.64E-02	1.42E-02	1.29E-02	1.41E-02	1.46E-02	1.57E-02	1.72E-02	1.83E-02	1.72E-02	1.30E-02	1.07E-02	9.69E-03	7.93E-03
	Emission in each Box of 1st jet	g/s	9.47E-04	6.56E-04	4.52E-04	3.54E-04	2.99E-04	5.86E-04	1.31E-03	3.03E-03	5.16E-03	4.81E-03	4.23E-03	4.10E-03	3.55E-03	3.23E-03	3.52E-03	3.66E-03	3.93E-03	4.29E-03	4.57E-03	4.30E-03	3.26E-03	2.67E-03	2.42E-03	1.98E-03
	Emission in each Box of 2nd jet	g/s	5.41E-04	3.75E-04	2.58E-04	2.02E-04	1.71E-04	3.35E-04	7.47E-04	1.73E-03	2.95E-03	2.75E-03	2.42E-03	2.35E-03	2.03E-03	1.85E-03	2.01E-03	2.09E-03	2.25E-03	2.45E-03	2.61E-03	2.46E-03	1.86E-03	1.53E-03	1.38E-03	1.13E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0007***	***0.0010***	***0.0022***	***0.0063***	***0.0122***	***0.0114***	***0.0100***	***0.0096***	***0.0075***	***0.0067***	***0.0074***	***0.0076***	***0.0081***	***0.0089***	***0.0096***	***0.0092***	***0.0068***	***0.0053***	***0.0047***	***0.0039***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.48E-03	1.14E-03	7.84E-04	5.86E-04	4.91E-04	6.79E-04	1.48E-03	4.17E-03	8.13E-03	7.59E-03	6.64E-03	6.41E-03	4.97E-03	4.47E-03	4.90E-03	5.10E-03	5.43E-03	5.94E-03	6.42E-03	6.16E-03	4.52E-03	3.51E-03	3.16E-03	2.63E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.38E-04	5.68E-04	3.92E-04	2.93E-04	2.45E-04	3.39E-04	7.39E-04	2.09E-03	4.06E-03	3.79E-03	3.32E-03	3.20E-03	2.48E-03	2.23E-03	2.45E-03	2.55E-03	2.71E-03	2.97E-03	3.21E-03	3.08E-03	2.26E-03	1.75E-03	1.58E-03	1.31E-03
	Emission in each Box of 1st jet	g/s	1.84E-04	1.42E-04	9.80E-05	7.32E-05	6.14E-05	8.48E-05	1.85E-04	5.22E-04	1.02E-03	9.48E-04	8.30E-04	8.01E-04	6.21E-04	5.58E-04	6.13E-04	6.37E-04	6.78E-04	7.43E-04	8.02E-04	7.70E-04	5.66E-04	4.39E-04	3.95E-04	3.29E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	8.11E-05	5.60E-05	4.18E-05	3.51E-05	4.85E-05	1.06E-04	2.98E-04	5.81E-04	5.42E-04	4.74E-04	4.58E-04	3.55E-04	3.19E-04	3.50E-04	3.64E-04	3.88E-04	4.24E-04	4.59E-04	4.40E-04	3.23E-04	2.51E-04	2.26E-04	1.88E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1892	0.1676	0.1723	0.1801	0.1829	0.2995	0.3126	0.2974	0.3407	0.3239	0.3086	0.3074	0.2954	0.2981	0.3022	0.3023	0.3108	0.3216	0.3316	0.3183	0.2922	0.2877	0.2768	0.2635
	NO2	g/vehicle/km	0.0371	0.0365	0.0375	0.0374	0.0377	0.0434	0.0443	0.0512	0.0671	0.0639	0.0606	0.0600	0.0517	0.0515	0.0527	0.0527	0.0536	0.0556	0.0582	0.0569	0.0507	0.0473	0.0452	0.0437
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0104***	***0.0075***	***0.0053***	***0.0041***	***0.0035***	***0.0067***	***0.0150***	***0.0358***	***0.0617***	***0.0569***	***0.0499***	***0.0475***	***0.0411***	***0.0389***	***0.0418***	***0.0438***	***0.0469***	***0.0522***	***0.0569***	***0.0524***	***0.0396***	***0.0321***	***0.0288***	***0.0241***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.91E-03	4.97E-03	3.52E-03	2.73E-03	2.30E-03	4.48E-03	9.99E-03	2.39E-02	4.11E-02	3.79E-02	3.32E-02	3.17E-02	2.74E-02	2.59E-02	2.78E-02	2.92E-02	3.12E-02	3.48E-02	3.79E-02	3.49E-02	2.64E-02	2.14E-02	1.92E-02	1.61E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.46E-03	2.49E-03	1.76E-03	1.37E-03	1.15E-03	2.24E-03	4.99E-03	1.19E-02	2.06E-02	1.90E-02	1.66E-02	1.58E-02	1.37E-02	1.30E-02	1.39E-02	1.46E-02	1.56E-02	1.74E-02	1.90E-02	1.75E-02	1.32E-02	1.07E-02	9.61E-03	8.03E-03
	Emission in each Box of 1st jet	g/s	8.64E-04	6.21E-04	4.40E-04	3.41E-04	2.88E-04	5.60E-04	1.25E-03	2.99E-03	5.14E-03	4.74E-03	4.15E-03	3.96E-03	3.42E-03	3.24E-03	3.48E-03	3.65E-03	3.90E-03	4.35E-03	4.74E-03	4.37E-03	3.30E-03	2.68E-03	2.40E-03	2.01E-03
	Emission in each Box of 2nd jet	g/s	4.94E-04	3.55E-04	2.51E-04	1.95E-04	1.64E-04	3.20E-04	7.13E-04	1.71E-03	2.94E-03	2.71E-03	2.37E-03	2.26E-03	1.96E-03	1.85E-03	1.99E-03	2.09E-03	2.23E-03	2.49E-03	2.71E-03	2.50E-03	1.89E-03	1.53E-03	1.37E-03	1.15E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0009***	***0.0007***	***0.0010***	***0.0021***	***0.0062***	***0.0121***	***0.0112***	***0.0098***	***0.0093***	***0.0072***	***0.0067***	***0.0073***	***0.0076***	***0.0081***	***0.0090***	***0.0100***	***0.0094***	***0.0069***	***0.0053***	***0.0047***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.35E-03	1.08E-03	7.65E-04	5.67E-04	4.74E-04	6.50E-04	1.41E-03	4.11E-03	8.10E-03	7.48E-03	6.52E-03	6.19E-03	4.80E-03	4.48E-03	4.86E-03	5.09E-03	5.39E-03	6.01E-03	6.65E-03	6.25E-03	4.58E-03	3.52E-03	3.14E-03	2.67E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.77E-04	5.41E-04	3.83E-04	2.84E-04	2.37E-04	3.25E-04	7.07E-04	2.06E-03	4.05E-03	3.74E-03	3.26E-03	3.09E-03	2.40E-03	2.24E-03	2.43E-03	2.55E-03	2.69E-03	3.01E-03	3.33E-03	3.12E-03	2.29E-03	1.76E-03	1.57E-03	1.33E-03
	Emission in each Box of 1st jet	g/s	1.69E-04	1.35E-04	9.57E-05	7.09E-05	5.93E-05	8.12E-05	1.77E-04	5.14E-04	1.01E-03	9.35E-04	8.16E-04	7.74E-04	6.00E-04	5.60E-04	6.07E-04	6.36E-04	6.73E-04	7.52E-04	8.31E-04	7.81E-04	5.72E-04	4.40E-04	3.92E-04	3.33E-04
	Emission in each Box of 2nd jet	g/s	9.67E-05	7.73E-05	5.47E-05	4.05E-05	3.39E-05	4.64E-05	1.01E-04	2.94E-04	5.79E-04	5.34E-04	4.66E-04	4.42E-04	3.43E-04	3.20E-04	3.47E-04	3.64E-04	3.85E-04	4.30E-04	4.75E-04	4.46E-04	3.27E-04	2.51E-04	2.24E-04	1.90E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1850	0.1619	0.1653	0.1725	0.1726	0.2919	0.3002	0.2839	0.3231	0.3240	0.3135	0.3222	0.3062	0.3029	0.3082	0.3106	0.3081	0.3174	0.3209	0.3058	0.2734	0.2693	0.2597	0.2401
	NO2	g/vehicle/km	0.0363	0.0353	0.0360	0.0359	0.0357	0.0424	0.0426	0.0490	0.0637	0.0639	0.0615	0.0628	0.0536	0.0522	0.0538	0.0541	0.0532	0.0549	0.0563	0.0549	0.0476	0.0444	0.0425	0.0400
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0101***	***0.0072***	***0.0051***	***0.0039***	***0.0033***	***0.0065***	***0.0144***	***0.0342***	***0.0585***	***0.0569***	***0.0506***	***0.0498***	***0.0426***	***0.0395***	***0.0426***	***0.0450***	***0.0464***	***0.0515***	***0.0550***	***0.0503***	***0.0370***	***0.0301***	***0.0270***	***0.0220***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.76E-03	4.80E-03	3.38E-03	2.62E-03	2.17E-03	4.37E-03	9.59E-03	2.28E-02	3.90E-02	3.80E-02	3.38E-02	3.32E-02	2.84E-02	2.63E-02	2.84E-02	3.00E-02	3.10E-02	3.44E-02	3.67E-02	3.36E-02	2.47E-02	2.00E-02	1.80E-02	1.46E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.38E-03	2.40E-03	1.69E-03	1.31E-03	1.09E-03	2.18E-03	4.80E-03	1.14E-02	1.95E-02	1.90E-02	1.69E-02	1.66E-02	1.42E-02	1.32E-02	1.42E-02	1.50E-02	1.55E-02	1.72E-02	1.83E-02	1.68E-02	1.23E-02	1.00E-02	9.01E-03	7.32E-03
	Emission in each Box of 1st jet	g/s	8.45E-04	6.00E-04	4.22E-04	3.27E-04	2.72E-04	5.46E-04	1.20E-03	2.85E-03	4.88E-03	4.75E-03	4.22E-03	4.15E-03	3.55E-03	3.29E-03	3.55E-03	3.75E-03	3.87E-03	4.30E-03	4.59E-03	4.20E-03	3.09E-03	2.50E-03	2.25E-03	1.83E-03
	Emission in each Box of 2nd jet	g/s	4.83E-04	3.43E-04	2.41E-04	1.87E-04	1.55E-04	3.12E-04	6.85E-04	1.63E-03	2.79E-03	2.71E-03	2.41E-03	2.37E-03	2.03E-03	1.88E-03	2.03E-03	2.14E-03	2.21E-03	2.45E-03	2.62E-03	2.40E-03	1.76E-03	1.43E-03	1.29E-03	1.05E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0020***	***0.0059***	***0.0115***	***0.0112***	***0.0099***	***0.0097***	***0.0075***	***0.0068***	***0.0074***	***0.0078***	***0.0080***	***0.0089***	***0.0097***	***0.0090***	***0.0064***	***0.0050***	***0.0044***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.33E-03	1.05E-03	7.36E-04	5.45E-04	4.49E-04	6.34E-04	1.36E-03	3.93E-03	7.69E-03	7.48E-03	6.62E-03	6.48E-03	4.97E-03	4.54E-03	4.95E-03	5.23E-03	5.34E-03	5.94E-03	6.44E-03	6.02E-03	4.30E-03	3.30E-03	2.95E-03	2.44E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.63E-04	5.23E-04	3.68E-04	2.72E-04	2.24E-04	3.17E-04	6.81E-04	1.97E-03	3.85E-03	3.74E-03	3.31E-03	3.24E-03	2.48E-03	2.27E-03	2.48E-03	2.62E-03	2.67E-03	2.97E-03	3.22E-03	3.01E-03	2.15E-03	1.65E-03	1.48E-03	1.22E-03
	Emission in each Box of 1st jet	g/s	1.66E-04	1.31E-04	9.20E-05	6.81E-05	5.61E-05	7.92E-05	1.70E-04	4.92E-04	9.62E-04	9.35E-04	8.28E-04	8.10E-04	6.21E-04	5.68E-04	6.19E-04	6.54E-04	6.68E-04	7.43E-04	8.05E-04	7.52E-04	5.37E-04	4.13E-04	3.69E-04	3.05E-04
	Emission in each Box of 2nd jet	g/s	9.47E-05	7.48E-05	5.25E-05	3.89E-05	3.21E-05	4.53E-05	9.73E-05	2.81E-04	5.50E-04	5.34E-04	4.73E-04	4.63E-04	3.55E-04	3.25E-04	3.54E-04	3.74E-04	3.82E-04	4.24E-04	4.60E-04	4.30E-04	3.07E-04	2.36E-04	2.11E-04	1.74E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1955	0.1663	0.1709	0.1815	0.1829	0.2983	0.3113	0.2826	0.3262	0.3177	0.3065	0.3086	0.2978	0.3024	0.3086	0.3066	0.3287	0.3322	0.3388	0.3235	0.2865	0.2735	0.2694	0.2526
	NO2	g/vehicle/km	0.0383	0.0362	0.0372	0.0377	0.0377	0.0432	0.0441	0.0488	0.0643	0.0627	0.0602	0.0603	0.0521	0.0522	0.0539	0.0534	0.0566	0.0574	0.0593	0.0579	0.0497	0.0450	0.0440	0.0419
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0107***	***0.0074***	***0.0052***	***0.0041***	***0.0035***	***0.0067***	***0.0149***	***0.0341***	***0.0591***	***0.0558***	***0.0495***	***0.0477***	***0.0414***	***0.0395***	***0.0426***	***0.0444***	***0.0495***	***0.0540***	***0.0581***	***0.0533***	***0.0388***	***0.0305***	***0.0280***	***0.0231***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.14E-03	4.93E-03	3.49E-03	2.75E-03	2.30E-03	4.46E-03	9.94E-03	2.27E-02	3.94E-02	3.72E-02	3.30E-02	3.18E-02	2.76E-02	2.63E-02	2.84E-02	2.96E-02	3.30E-02	3.60E-02	3.87E-02	3.55E-02	2.59E-02	2.03E-02	1.87E-02	1.54E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.57E-03	2.47E-03	1.75E-03	1.38E-03	1.15E-03	2.23E-03	4.97E-03	1.14E-02	1.97E-02	1.86E-02	1.65E-02	1.59E-02	1.38E-02	1.32E-02	1.42E-02	1.48E-02	1.65E-02	1.80E-02	1.94E-02	1.78E-02	1.29E-02	1.02E-02	9.35E-03	7.70E-03
	Emission in each Box of 1st jet	g/s	8.93E-04	6.17E-04	4.36E-04	3.44E-04	2.88E-04	5.58E-04	1.24E-03	2.84E-03	4.92E-03	4.65E-03	4.13E-03	3.98E-03	3.45E-03	3.29E-03	3.55E-03	3.70E-03	4.13E-03	4.50E-03	4.84E-03	4.44E-03	3.23E-03	2.54E-03	2.34E-03	1.92E-03
	Emission in each Box of 2nd jet	g/s	5.10E-04	3.52E-04	2.49E-04	1.97E-04	1.64E-04	3.19E-04	7.10E-04	1.62E-03	2.81E-03	2.66E-03	2.36E-03	2.27E-03	1.97E-03	1.88E-03	2.03E-03	2.12E-03	2.36E-03	2.57E-03	2.77E-03	2.54E-03	1.85E-03	1.45E-03	1.34E-03	1.10E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0009***	***0.0007***	***0.0010***	***0.0021***	***0.0059***	***0.0116***	***0.0110***	***0.0097***	***0.0093***	***0.0073***	***0.0068***	***0.0074***	***0.0077***	***0.0085***	***0.0093***	***0.0102***	***0.0095***	***0.0067***	***0.0050***	***0.0046***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.40E-03	1.07E-03	7.60E-04	5.72E-04	4.74E-04	6.47E-04	1.41E-03	3.92E-03	7.76E-03	7.34E-03	6.48E-03	6.21E-03	4.84E-03	4.54E-03	4.96E-03	5.16E-03	5.69E-03	6.21E-03	6.79E-03	6.35E-03	4.49E-03	3.35E-03	3.06E-03	2.56E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.99E-04	5.36E-04	3.80E-04	2.86E-04	2.37E-04	3.23E-04	7.05E-04	1.96E-03	3.88E-03	3.67E-03	3.24E-03	3.11E-03	2.42E-03	2.27E-03	2.48E-03	2.58E-03	2.84E-03	3.11E-03	3.39E-03	3.18E-03	2.25E-03	1.68E-03	1.53E-03	1.28E-03
	Emission in each Box of 1st jet	g/s	1.75E-04	1.34E-04	9.50E-05	7.14E-05	5.93E-05	8.09E-05	1.76E-04	4.90E-04	9.71E-04	9.18E-04	8.10E-04	7.77E-04	6.04E-04	5.67E-04	6.20E-04	6.45E-04	7.11E-04	7.76E-04	8.48E-04	7.94E-04	5.62E-04	4.19E-04	3.82E-04	3.20E-04
	Emission in each Box of 2nd jet	g/s	9.98E-05	7.66E-05	5.43E-05	4.08E-05	3.39E-05	4.62E-05	1.01E-04	2.80E-04	5.55E-04	5.25E-04	4.63E-04	4.44E-04	3.45E-04	3.24E-04	3.54E-04	3.69E-04	4.06E-04	4.44E-04	4.85E-04	4.54E-04	3.21E-04	2.39E-04	2.18E-04	1.83E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1942	0.1699	0.1686	0.1741	0.1820	0.2905	0.3045	0.2779	0.3124	0.3038	0.3040	0.2949	0.2929	0.2939	0.3065	0.2907	0.2959	0.3146	0.3236	0.3090	0.2862	0.2760	0.2687	0.2497
	NO2	g/vehicle/km	0.0380	0.0369	0.0367	0.0362	0.0375	0.0422	0.0432	0.0480	0.0617	0.0600	0.0597	0.0577	0.0513	0.0508	0.0535	0.0508	0.0512	0.0544	0.0568	0.0554	0.0497	0.0454	0.0439	0.0415
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0106***	***0.0076***	***0.0052***	***0.0040***	***0.0034***	***0.0065***	***0.0146***	***0.0335***	***0.0566***	***0.0534***	***0.0491***	***0.0456***	***0.0407***	***0.0384***	***0.0423***	***0.0421***	***0.0446***	***0.0511***	***0.0555***	***0.0509***	***0.0388***	***0.0308***	***0.0280***	***0.0228***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.09E-03	5.04E-03	3.44E-03	2.64E-03	2.29E-03	4.35E-03	9.73E-03	2.23E-02	3.77E-02	3.56E-02	3.27E-02	3.04E-02	2.72E-02	2.56E-02	2.82E-02	2.81E-02	2.97E-02	3.41E-02	3.70E-02	3.39E-02	2.59E-02	2.05E-02	1.86E-02	1.52E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.55E-03	2.52E-03	1.72E-03	1.32E-03	1.15E-03	2.17E-03	4.86E-03	1.12E-02	1.89E-02	1.78E-02	1.64E-02	1.52E-02	1.36E-02	1.28E-02	1.41E-02	1.40E-02	1.49E-02	1.70E-02	1.85E-02	1.70E-02	1.29E-02	1.03E-02	9.32E-03	7.61E-03
	Emission in each Box of 1st jet	g/s	8.86E-04	6.30E-04	4.30E-04	3.30E-04	2.86E-04	5.43E-04	1.22E-03	2.79E-03	4.72E-03	4.45E-03	4.09E-03	3.80E-03	3.40E-03	3.20E-03	3.53E-03	3.51E-03	3.72E-03	4.26E-03	4.63E-03	4.24E-03	3.23E-03	2.57E-03	2.33E-03	1.90E-03
	Emission in each Box of 2nd jet	g/s	5.07E-04	3.60E-04	2.46E-04	1.89E-04	1.64E-04	3.10E-04	6.95E-04	1.59E-03	2.69E-03	2.54E-03	2.34E-03	2.17E-03	1.94E-03	1.83E-03	2.02E-03	2.01E-03	2.12E-03	2.43E-03	2.64E-03	2.42E-03	1.85E-03	1.47E-03	1.33E-03	1.09E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0009***	***0.0021***	***0.0058***	***0.0112***	***0.0105***	***0.0096***	***0.0089***	***0.0071***	***0.0066***	***0.0074***	***0.0074***	***0.0077***	***0.0088***	***0.0097***	***0.0091***	***0.0067***	***0.0051***	***0.0046***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.39E-03	1.10E-03	7.50E-04	5.49E-04	4.71E-04	6.31E-04	1.38E-03	3.85E-03	7.45E-03	7.03E-03	6.43E-03	5.95E-03	4.76E-03	4.42E-03	4.92E-03	4.91E-03	5.15E-03	5.89E-03	6.49E-03	6.08E-03	4.49E-03	3.38E-03	3.05E-03	2.53E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.94E-04	5.48E-04	3.75E-04	2.75E-04	2.36E-04	3.16E-04	6.90E-04	1.93E-03	3.73E-03	3.51E-03	3.21E-03	2.97E-03	2.38E-03	2.21E-03	2.46E-03	2.45E-03	2.57E-03	2.95E-03	3.25E-03	3.04E-03	2.24E-03	1.69E-03	1.52E-03	1.27E-03
	Emission in each Box of 1st jet	g/s	1.74E-04	1.37E-04	9.37E-05	6.87E-05	5.89E-05	7.89E-05	1.73E-04	4.82E-04	9.32E-04	8.79E-04	8.03E-04	7.43E-04	5.94E-04	5.52E-04	6.16E-04	6.13E-04	6.43E-04	7.37E-04	8.12E-04	7.60E-04	5.61E-04	4.23E-04	3.81E-04	3.16E-04
	Emission in each Box of 2nd jet	g/s	9.92E-05	7.83E-05	5.36E-05	3.92E-05	3.37E-05	4.51E-05	9.86E-05	2.75E-04	5.32E-04	5.02E-04	4.59E-04	4.25E-04	3.40E-04	3.15E-04	3.52E-04	3.50E-04	3.68E-04	4.21E-04	4.64E-04	4.34E-04	3.21E-04	2.41E-04	2.18E-04	1.81E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2210	0.1958	0.1955	0.2053	0.2101	0.3500	0.3633	0.3318	0.3713	0.3570	0.3395	0.3448	0.3344	0.3283	0.3302	0.3344	0.3413	0.3530	0.3629	0.3492	0.3216	0.3103	0.3048	0.2885
	NO2	g/vehicle/km	0.0428	0.0419	0.0419	0.0420	0.0426	0.0502	0.0510	0.0566	0.0726	0.0699	0.0662	0.0669	0.0581	0.0563	0.0573	0.0579	0.0586	0.0607	0.0632	0.0621	0.0554	0.0507	0.0494	0.0475
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0121***	***0.0087***	***0.0060***	***0.0047***	***0.0040***	***0.0079***	***0.0174***	***0.0400***	***0.0673***	***0.0627***	***0.0548***	***0.0533***	***0.0465***	***0.0428***	***0.0456***	***0.0485***	***0.0514***	***0.0573***	***0.0623***	***0.0575***	***0.0436***	***0.0346***	***0.0317***	***0.0264***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.07E-03	5.81E-03	3.99E-03	3.11E-03	2.64E-03	5.23E-03	1.16E-02	2.67E-02	4.48E-02	4.18E-02	3.66E-02	3.55E-02	3.10E-02	2.86E-02	3.04E-02	3.23E-02	3.43E-02	3.82E-02	4.15E-02	3.83E-02	2.91E-02	2.31E-02	2.12E-02	1.76E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.04E-03	2.90E-03	2.00E-03	1.56E-03	1.32E-03	2.62E-03	5.80E-03	1.33E-02	2.24E-02	2.09E-02	1.83E-02	1.78E-02	1.55E-02	1.43E-02	1.52E-02	1.62E-02	1.71E-02	1.91E-02	2.08E-02	1.92E-02	1.45E-02	1.15E-02	1.06E-02	8.79E-03
	Emission in each Box of 1st jet	g/s	1.01E-03	7.26E-04	4.99E-04	3.89E-04	3.30E-04	6.54E-04	1.45E-03	3.33E-03	5.60E-03	5.23E-03	4.57E-03	4.44E-03	3.88E-03	3.57E-03	3.80E-03	4.04E-03	4.29E-03	4.78E-03	5.19E-03	4.79E-03	3.63E-03	2.89E-03	2.64E-03	2.20E-03
	Emission in each Box of 2nd jet	g/s	5.77E-04	4.15E-04	2.85E-04	2.22E-04	1.89E-04	3.74E-04	8.29E-04	1.90E-03	3.20E-03	2.99E-03	2.61E-03	2.54E-03	2.22E-03	2.04E-03	2.17E-03	2.31E-03	2.45E-03	2.73E-03	2.96E-03	2.74E-03	2.08E-03	1.65E-03	1.51E-03	1.26E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0011***	***0.0024***	***0.0068***	***0.0132***	***0.0123***	***0.0107***	***0.0103***	***0.0081***	***0.0074***	***0.0079***	***0.0084***	***0.0088***	***0.0099***	***0.0108***	***0.0102***	***0.0075***	***0.0057***	***0.0051***	***0.0043***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.56E-03	1.24E-03	8.57E-04	6.38E-04	5.36E-04	7.51E-04	1.63E-03	4.55E-03	8.77E-03	8.18E-03	7.13E-03	6.90E-03	5.39E-03	4.90E-03	5.28E-03	5.60E-03	5.89E-03	6.57E-03	7.23E-03	6.82E-03	5.00E-03	3.77E-03	3.43E-03	2.90E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.81E-04	6.22E-04	4.28E-04	3.19E-04	2.68E-04	3.75E-04	8.14E-04	2.27E-03	4.38E-03	4.09E-03	3.57E-03	3.45E-03	2.69E-03	2.45E-03	2.64E-03	2.80E-03	2.94E-03	3.29E-03	3.61E-03	3.41E-03	2.50E-03	1.89E-03	1.71E-03	1.45E-03
	Emission in each Box of 1st jet	g/s	1.95E-04	1.55E-04	1.07E-04	7.97E-05	6.70E-05	9.39E-05	2.04E-04	5.69E-04	1.10E-03	1.02E-03	8.92E-04	8.62E-04	6.74E-04	6.13E-04	6.60E-04	7.00E-04	7.36E-04	8.21E-04	9.04E-04	8.52E-04	6.26E-04	4.72E-04	4.28E-04	3.62E-04
	Emission in each Box of 2nd jet	g/s	1.12E-04	8.88E-05	6.12E-05	4.55E-05	3.83E-05	5.36E-05	1.16E-04	3.25E-04	6.26E-04	5.85E-04	5.10E-04	4.93E-04	3.85E-04	3.50E-04	3.77E-04	4.00E-04	4.21E-04	4.69E-04	5.16E-04	4.87E-04	3.57E-04	2.69E-04	2.45E-04	2.07E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2417	0.2100	0.2127	0.2246	0.2293	0.3787	0.3971	0.3587	0.4013	0.3845	0.3668	0.3671	0.3583	0.3550	0.3589	0.3575	0.3659	0.3762	0.3866	0.3786	0.3446	0.3387	0.3308	0.3115
	NO2	g/vehicle/km	0.0464	0.0447	0.0452	0.0456	0.0461	0.0541	0.0554	0.0610	0.0779	0.0748	0.0711	0.0708	0.0618	0.0604	0.0618	0.0615	0.0624	0.0643	0.0670	0.0669	0.0590	0.0549	0.0532	0.0509
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0132***	***0.0093***	***0.0065***	***0.0051***	***0.0043***	***0.0085***	***0.0190***	***0.0432***	***0.0727***	***0.0676***	***0.0593***	***0.0568***	***0.0499***	***0.0463***	***0.0496***	***0.0518***	***0.0552***	***0.0611***	***0.0663***	***0.0623***	***0.0467***	***0.0378***	***0.0344***	***0.0285***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.83E-03	6.23E-03	4.34E-03	3.41E-03	2.89E-03	5.66E-03	1.27E-02	2.88E-02	4.85E-02	4.51E-02	3.95E-02	3.78E-02	3.32E-02	3.09E-02	3.31E-02	3.46E-02	3.68E-02	4.07E-02	4.42E-02	4.16E-02	3.11E-02	2.52E-02	2.30E-02	1.90E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.41E-03	3.11E-03	2.17E-03	1.70E-03	1.44E-03	2.83E-03	6.34E-03	1.44E-02	2.42E-02	2.25E-02	1.98E-02	1.89E-02	1.66E-02	1.54E-02	1.65E-02	1.73E-02	1.84E-02	2.04E-02	2.21E-02	2.08E-02	1.56E-02	1.26E-02	1.15E-02	9.49E-03
	Emission in each Box of 1st jet	g/s	1.10E-03	7.79E-04	5.43E-04	4.26E-04	3.61E-04	7.08E-04	1.59E-03	3.60E-03	6.06E-03	5.63E-03	4.94E-03	4.73E-03	4.15E-03	3.86E-03	4.13E-03	4.32E-03	4.60E-03	5.09E-03	5.53E-03	5.19E-03	3.89E-03	3.15E-03	2.87E-03	2.37E-03
	Emission in each Box of 2nd jet	g/s	6.30E-04	4.45E-04	3.10E-04	2.43E-04	2.06E-04	4.05E-04	9.06E-04	2.06E-03	3.46E-03	3.22E-03	2.82E-03	2.70E-03	2.37E-03	2.21E-03	2.36E-03	2.47E-03	2.63E-03	2.91E-03	3.16E-03	2.97E-03	2.22E-03	1.80E-03	1.64E-03	1.36E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0020***	***0.0014***	***0.0010***	***0.0009***	***0.0012***	***0.0027***	***0.0074***	***0.0141***	***0.0132***	***0.0115***	***0.0110***	***0.0086***	***0.0079***	***0.0085***	***0.0089***	***0.0094***	***0.0104***	***0.0115***	***0.0110***	***0.0080***	***0.0061***	***0.0055***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.70E-03	1.33E-03	9.24E-04	6.91E-04	5.80E-04	8.09E-04	1.77E-03	4.90E-03	9.41E-03	8.77E-03	7.66E-03	7.30E-03	5.73E-03	5.26E-03	5.69E-03	5.95E-03	6.27E-03	6.96E-03	7.66E-03	7.34E-03	5.33E-03	4.08E-03	3.70E-03	3.10E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.48E-04	6.64E-04	4.62E-04	3.46E-04	2.90E-04	4.04E-04	8.85E-04	2.45E-03	4.71E-03	4.38E-03	3.83E-03	3.65E-03	2.87E-03	2.63E-03	2.85E-03	2.97E-03	3.14E-03	3.48E-03	3.83E-03	3.67E-03	2.67E-03	2.04E-03	1.85E-03	1.55E-03
	Emission in each Box of 1st jet	g/s	2.12E-04	1.66E-04	1.15E-04	8.64E-05	7.25E-05	1.01E-04	2.21E-04	6.13E-04	1.18E-03	1.10E-03	9.57E-04	9.13E-04	7.16E-04	6.57E-04	7.12E-04	7.43E-04	7.84E-04	8.70E-04	9.58E-04	9.17E-04	6.66E-04	5.11E-04	4.62E-04	3.88E-04
	Emission in each Box of 2nd jet	g/s	1.21E-04	9.48E-05	6.60E-05	4.94E-05	4.14E-05	5.78E-05	1.26E-04	3.50E-04	6.72E-04	6.26E-04	5.47E-04	5.22E-04	4.09E-04	3.76E-04	4.07E-04	4.25E-04	4.48E-04	4.97E-04	5.47E-04	5.24E-04	3.81E-04	2.92E-04	2.64E-04	2.22E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2511	0.2195	0.2224	0.2352	0.2390	0.3906	0.4095	0.3719	0.4131	0.3955	0.3771	0.3802	0.3693	0.3641	0.3683	0.3678	0.3788	0.3933	0.3994	0.3907	0.3565	0.3500	0.3425	0.3237
	NO2	g/vehicle/km	0.0479	0.0462	0.0467	0.0471	0.0475	0.0554	0.0568	0.0627	0.0798	0.0765	0.0726	0.0729	0.0633	0.0617	0.0631	0.0630	0.0642	0.0668	0.0688	0.0686	0.0606	0.0564	0.0547	0.0526
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0138***	***0.0098***	***0.0068***	***0.0054***	***0.0045***	***0.0088***	***0.0196***	***0.0448***	***0.0748***	***0.0695***	***0.0609***	***0.0588***	***0.0514***	***0.0475***	***0.0509***	***0.0533***	***0.0571***	***0.0639***	***0.0685***	***0.0643***	***0.0483***	***0.0391***	***0.0357***	***0.0296***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.17E-03	6.51E-03	4.54E-03	3.57E-03	3.01E-03	5.84E-03	1.31E-02	2.99E-02	4.99E-02	4.63E-02	4.06E-02	3.92E-02	3.42E-02	3.17E-02	3.39E-02	3.55E-02	3.81E-02	4.26E-02	4.57E-02	4.29E-02	3.22E-02	2.60E-02	2.38E-02	1.97E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.59E-03	3.26E-03	2.27E-03	1.78E-03	1.50E-03	2.92E-03	6.54E-03	1.49E-02	2.49E-02	2.32E-02	2.03E-02	1.96E-02	1.71E-02	1.58E-02	1.70E-02	1.78E-02	1.90E-02	2.13E-02	2.28E-02	2.14E-02	1.61E-02	1.30E-02	1.19E-02	9.87E-03
	Emission in each Box of 1st jet	g/s	1.15E-03	8.14E-04	5.68E-04	4.46E-04	3.76E-04	7.30E-04	1.64E-03	3.73E-03	6.24E-03	5.79E-03	5.08E-03	4.90E-03	4.28E-03	3.96E-03	4.24E-03	4.44E-03	4.76E-03	5.32E-03	5.71E-03	5.36E-03	4.03E-03	3.25E-03	2.97E-03	2.47E-03
	Emission in each Box of 2nd jet	g/s	6.55E-04	4.65E-04	3.24E-04	2.55E-04	2.15E-04	4.17E-04	9.35E-04	2.13E-03	3.56E-03	3.31E-03	2.90E-03	2.80E-03	2.45E-03	2.26E-03	2.42E-03	2.54E-03	2.72E-03	3.04E-03	3.26E-03	3.06E-03	2.30E-03	1.86E-03	1.70E-03	1.41E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0021***	***0.0014***	***0.0011***	***0.0009***	***0.0012***	***0.0027***	***0.0076***	***0.0145***	***0.0134***	***0.0117***	***0.0113***	***0.0088***	***0.0080***	***0.0087***	***0.0091***	***0.0097***	***0.0108***	***0.0118***	***0.0113***	***0.0082***	***0.0063***	***0.0057***	***0.0048***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.75E-03	1.37E-03	9.54E-04	7.15E-04	5.98E-04	8.29E-04	1.81E-03	5.04E-03	9.64E-03	8.96E-03	7.82E-03	7.51E-03	5.87E-03	5.36E-03	5.81E-03	6.09E-03	6.46E-03	7.23E-03	7.87E-03	7.53E-03	5.47E-03	4.20E-03	3.80E-03	3.21E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.74E-04	6.85E-04	4.77E-04	3.57E-04	2.99E-04	4.14E-04	9.07E-04	2.52E-03	4.82E-03	4.48E-03	3.91E-03	3.76E-03	2.94E-03	2.68E-03	2.91E-03	3.04E-03	3.23E-03	3.62E-03	3.94E-03	3.77E-03	2.74E-03	2.10E-03	1.90E-03	1.60E-03
	Emission in each Box of 1st jet	g/s	2.18E-04	1.71E-04	1.19E-04	8.94E-05	7.47E-05	1.04E-04	2.27E-04	6.30E-04	1.20E-03	1.12E-03	9.78E-04	9.39E-04	7.34E-04	6.70E-04	7.27E-04	7.61E-04	8.07E-04	9.04E-04	9.84E-04	9.42E-04	6.84E-04	5.25E-04	4.75E-04	4.01E-04
	Emission in each Box of 2nd jet	g/s	1.25E-04	9.79E-05	6.81E-05	5.11E-05	4.27E-05	5.92E-05	1.30E-04	3.60E-04	6.88E-04	6.40E-04	5.59E-04	5.36E-04	4.20E-04	3.83E-04	4.15E-04	4.35E-04	4.61E-04	5.17E-04	5.62E-04	5.38E-04	3.91E-04	3.00E-04	2.71E-04	2.29E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1429	0.1238	0.1257	0.1341	0.1355	0.2329	0.2446	0.1834	0.1832	0.1783	0.1714	0.1695	0.2165	0.2126	0.2171	0.2230	0.2277	0.2414	0.2529	0.2372	0.2102	0.2075	0.2034	0.1950
	NO2	g/vehicle/km	0.0243	0.0235	0.0240	0.0244	0.0245	0.0296	0.0303	0.0270	0.0323	0.0315	0.0298	0.0290	0.0359	0.0342	0.0360	0.0374	0.0382	0.0409	0.0436	0.0413	0.0344	0.0314	0.0303	0.0294
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0087***	***0.0062***	***0.0043***	***0.0034***	***0.0028***	***0.0057***	***0.0127***	***0.0244***	***0.0369***	***0.0348***	***0.0308***	***0.0291***	***0.0410***	***0.0377***	***0.0409***	***0.0440***	***0.0469***	***0.0535***	***0.0592***	***0.0533***	***0.0388***	***0.0315***	***0.0288***	***0.0243***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.80E-03	4.10E-03	2.87E-03	2.26E-03	1.90E-03	3.78E-03	8.47E-03	1.62E-02	2.46E-02	2.32E-02	2.05E-02	1.94E-02	2.73E-02	2.52E-02	2.72E-02	2.94E-02	3.12E-02	3.57E-02	3.95E-02	3.55E-02	2.59E-02	2.10E-02	1.92E-02	1.62E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.90E-03	2.05E-03	1.43E-03	1.13E-03	9.48E-04	1.89E-03	4.23E-03	8.12E-03	1.23E-02	1.16E-02	1.03E-02	9.69E-03	1.37E-02	1.26E-02	1.36E-02	1.47E-02	1.56E-02	1.78E-02	1.97E-02	1.78E-02	1.29E-02	1.05E-02	9.60E-03	8.10E-03
	Emission in each Box of 1st jet	g/s	1.16E-03	8.20E-04	5.74E-04	4.52E-04	3.79E-04	7.56E-04	1.69E-03	3.25E-03	4.92E-03	4.64E-03	4.10E-03	3.88E-03	5.47E-03	5.03E-03	5.45E-03	5.87E-03	6.25E-03	7.14E-03	7.90E-03	7.11E-03	5.17E-03	4.19E-03	3.84E-03	3.24E-03
	Emission in each Box of 2nd jet	g/s	9.67E-04	6.84E-04	4.78E-04	3.76E-04	3.16E-04	6.30E-04	1.41E-03	2.71E-03	4.10E-03	3.87E-03	3.42E-03	3.23E-03	4.56E-03	4.19E-03	4.54E-03	4.89E-03	5.21E-03	5.95E-03	6.58E-03	5.92E-03	4.31E-03	3.50E-03	3.20E-03	2.70E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0016***	***0.0036***	***0.0065***	***0.0062***	***0.0054***	***0.0050***	***0.0068***	***0.0061***	***0.0068***	***0.0074***	***0.0079***	***0.0091***	***0.0102***	***0.0093***	***0.0064***	***0.0048***	***0.0043***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.87E-04	7.78E-04	5.47E-04	4.11E-04	3.42E-04	4.81E-04	1.05E-03	2.39E-03	4.34E-03	4.10E-03	3.57E-03	3.31E-03	4.54E-03	4.04E-03	4.52E-03	4.92E-03	5.24E-03	6.04E-03	6.80E-03	6.18E-03	4.24E-03	3.17E-03	2.86E-03	2.44E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.93E-04	3.89E-04	2.74E-04	2.06E-04	1.71E-04	2.41E-04	5.24E-04	1.20E-03	2.17E-03	2.05E-03	1.78E-03	1.66E-03	2.27E-03	2.02E-03	2.26E-03	2.46E-03	2.62E-03	3.02E-03	3.40E-03	3.09E-03	2.12E-03	1.58E-03	1.43E-03	1.22E-03
	Emission in each Box of 1st jet	g/s	1.97E-04	1.56E-04	1.09E-04	8.23E-05	6.84E-05	9.62E-05	2.10E-04	4.78E-04	8.68E-04	8.21E-04	7.14E-04	6.63E-04	9.07E-04	8.09E-04	9.04E-04	9.83E-04	1.05E-03	1.21E-03	1.36E-03	1.24E-03	8.47E-04	6.34E-04	5.71E-04	4.89E-04
	Emission in each Box of 2nd jet	g/s	1.64E-04	1.30E-04	9.12E-05	6.86E-05	5.70E-05	8.02E-05	1.75E-04	3.99E-04	7.23E-04	6.84E-04	5.95E-04	5.52E-04	7.56E-04	6.74E-04	7.53E-04	8.20E-04	8.74E-04	1.01E-03	1.13E-03	1.03E-03	7.06E-04	5.28E-04	4.76E-04	4.07E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1295	0.1116	0.1129	0.1212	0.1260	0.2199	0.2321	0.1721	0.1719	0.1698	0.1637	0.1611	0.2058	0.1995	0.2051	0.2113	0.2156	0.2260	0.2310	0.2163	0.1905	0.1888	0.1853	0.1773
	NO2	g/vehicle/km	0.0225	0.0217	0.0221	0.0226	0.0233	0.0283	0.0290	0.0257	0.0308	0.0304	0.0288	0.0279	0.0345	0.0325	0.0344	0.0358	0.0366	0.0387	0.0403	0.0382	0.0317	0.0289	0.0280	0.0271
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0079***	***0.0055***	***0.0039***	***0.0031***	***0.0026***	***0.0054***	***0.0121***	***0.0228***	***0.0346***	***0.0331***	***0.0294***	***0.0276***	***0.0390***	***0.0354***	***0.0386***	***0.0417***	***0.0444***	***0.0501***	***0.0541***	***0.0486***	***0.0352***	***0.0286***	***0.0262***	***0.0221***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.26E-03	3.70E-03	2.57E-03	2.04E-03	1.76E-03	3.57E-03	8.04E-03	1.52E-02	2.31E-02	2.21E-02	1.96E-02	1.84E-02	2.60E-02	2.36E-02	2.57E-02	2.78E-02	2.96E-02	3.34E-02	3.61E-02	3.24E-02	2.35E-02	1.91E-02	1.75E-02	1.47E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.63E-03	1.85E-03	1.29E-03	1.02E-03	8.81E-04	1.78E-03	4.02E-03	7.62E-03	1.15E-02	1.10E-02	9.79E-03	9.21E-03	1.30E-02	1.18E-02	1.29E-02	1.39E-02	1.48E-02	1.67E-02	1.80E-02	1.62E-02	1.17E-02	9.54E-03	8.74E-03	7.37E-03
	Emission in each Box of 1st jet	g/s	1.05E-03	7.40E-04	5.15E-04	4.08E-04	3.52E-04	7.14E-04	1.61E-03	3.05E-03	4.61E-03	4.42E-03	3.92E-03	3.69E-03	5.20E-03	4.72E-03	5.15E-03	5.56E-03	5.91E-03	6.68E-03	7.21E-03	6.48E-03	4.69E-03	3.82E-03	3.50E-03	2.95E-03
	Emission in each Box of 2nd jet	g/s	8.76E-04	6.16E-04	4.29E-04	3.40E-04	2.94E-04	5.95E-04	1.34E-03	2.54E-03	3.84E-03	3.68E-03	3.26E-03	3.07E-03	4.33E-03	3.93E-03	4.29E-03	4.64E-03	4.93E-03	5.57E-03	6.01E-03	5.40E-03	3.91E-03	3.18E-03	2.91E-03	2.46E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0034***	***0.0062***	***0.0059***	***0.0052***	***0.0048***	***0.0065***	***0.0058***	***0.0065***	***0.0071***	***0.0075***	***0.0086***	***0.0094***	***0.0086***	***0.0059***	***0.0044***	***0.0040***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.13E-04	7.19E-04	5.04E-04	3.81E-04	3.25E-04	4.60E-04	1.00E-03	2.27E-03	4.13E-03	3.96E-03	3.45E-03	3.19E-03	4.35E-03	3.84E-03	4.31E-03	4.71E-03	5.02E-03	5.72E-03	6.30E-03	5.72E-03	3.90E-03	2.92E-03	2.64E-03	2.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.57E-04	3.59E-04	2.52E-04	1.90E-04	1.63E-04	2.30E-04	5.02E-04	1.14E-03	2.07E-03	1.98E-03	1.73E-03	1.60E-03	2.18E-03	1.92E-03	2.16E-03	2.35E-03	2.51E-03	2.86E-03	3.15E-03	2.86E-03	1.95E-03	1.46E-03	1.32E-03	1.13E-03
	Emission in each Box of 1st jet	g/s	1.83E-04	1.44E-04	1.01E-04	7.62E-05	6.50E-05	9.19E-05	2.01E-04	4.54E-04	8.27E-04	7.92E-04	6.90E-04	6.38E-04	8.70E-04	7.69E-04	8.63E-04	9.42E-04	1.00E-03	1.14E-03	1.26E-03	1.14E-03	7.81E-04	5.85E-04	5.28E-04	4.51E-04
	Emission in each Box of 2nd jet	g/s	1.52E-04	1.20E-04	8.40E-05	6.35E-05	5.42E-05	7.66E-05	1.67E-04	3.79E-04	6.89E-04	6.60E-04	5.75E-04	5.32E-04	7.25E-04	6.41E-04	7.19E-04	7.85E-04	8.36E-04	9.53E-04	1.05E-03	9.53E-04	6.51E-04	4.87E-04	4.40E-04	3.76E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1306	0.1114	0.1128	0.1214	0.1235	0.2144	0.2245	0.1693	0.1687	0.1646	0.1549	0.1527	0.1951	0.1918	0.1956	0.2016	0.2067	0.2189	0.2296	0.2165	0.1930	0.1892	0.1888	0.1814
	NO2	g/vehicle/km	0.0227	0.0217	0.0221	0.0227	0.0229	0.0277	0.0282	0.0253	0.0303	0.0296	0.0275	0.0266	0.0329	0.0314	0.0330	0.0344	0.0353	0.0376	0.0402	0.0382	0.0321	0.0290	0.0285	0.0277
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0080***	***0.0055***	***0.0039***	***0.0031***	***0.0026***	***0.0052***	***0.0117***	***0.0225***	***0.0339***	***0.0321***	***0.0278***	***0.0262***	***0.0369***	***0.0340***	***0.0368***	***0.0398***	***0.0425***	***0.0485***	***0.0538***	***0.0487***	***0.0356***	***0.0287***	***0.0267***	***0.0226***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.30E-03	3.69E-03	2.57E-03	2.04E-03	1.73E-03	3.48E-03	7.77E-03	1.50E-02	2.26E-02	2.14E-02	1.85E-02	1.75E-02	2.46E-02	2.27E-02	2.45E-02	2.65E-02	2.84E-02	3.24E-02	3.59E-02	3.24E-02	2.38E-02	1.91E-02	1.78E-02	1.51E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.65E-03	1.84E-03	1.29E-03	1.02E-03	8.64E-04	1.74E-03	3.89E-03	7.49E-03	1.13E-02	1.07E-02	9.27E-03	8.73E-03	1.23E-02	1.13E-02	1.23E-02	1.33E-02	1.42E-02	1.62E-02	1.79E-02	1.62E-02	1.19E-02	9.57E-03	8.91E-03	7.54E-03
	Emission in each Box of 1st jet	g/s	1.06E-03	7.38E-04	5.15E-04	4.09E-04	3.46E-04	6.96E-04	1.55E-03	3.00E-03	4.52E-03	4.28E-03	3.71E-03	3.49E-03	4.93E-03	4.54E-03	4.91E-03	5.31E-03	5.67E-03	6.47E-03	7.17E-03	6.49E-03	4.75E-03	3.83E-03	3.56E-03	3.02E-03
	Emission in each Box of 2nd jet	g/s	8.84E-04	6.15E-04	4.29E-04	3.41E-04	2.88E-04	5.80E-04	1.30E-03	2.50E-03	3.77E-03	3.57E-03	3.09E-03	2.91E-03	4.10E-03	3.78E-03	4.09E-03	4.42E-03	4.73E-03	5.39E-03	5.98E-03	5.41E-03	3.96E-03	3.19E-03	2.97E-03	2.51E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0034***	***0.0061***	***0.0058***	***0.0049***	***0.0046***	***0.0062***	***0.0056***	***0.0062***	***0.0068***	***0.0073***	***0.0083***	***0.0094***	***0.0086***	***0.0059***	***0.0044***	***0.0040***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.22E-04	7.18E-04	5.04E-04	3.82E-04	3.20E-04	4.50E-04	9.76E-04	2.24E-03	4.06E-03	3.85E-03	3.29E-03	3.05E-03	4.16E-03	3.71E-03	4.14E-03	4.53E-03	4.84E-03	5.56E-03	6.27E-03	5.72E-03	3.95E-03	2.94E-03	2.69E-03	2.31E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.61E-04	3.59E-04	2.52E-04	1.91E-04	1.60E-04	2.25E-04	4.88E-04	1.12E-03	2.03E-03	1.92E-03	1.64E-03	1.52E-03	2.08E-03	1.86E-03	2.07E-03	2.26E-03	2.42E-03	2.78E-03	3.14E-03	2.86E-03	1.98E-03	1.47E-03	1.34E-03	1.15E-03
	Emission in each Box of 1st jet	g/s	1.84E-04	1.44E-04	1.01E-04	7.63E-05	6.40E-05	8.99E-05	1.95E-04	4.48E-04	8.13E-04	7.70E-04	6.58E-04	6.10E-04	8.31E-04	7.43E-04	8.28E-04	9.06E-04	9.68E-04	1.11E-03	1.25E-03	1.14E-03	7.91E-04	5.87E-04	5.38E-04	4.61E-04
	Emission in each Box of 2nd jet	g/s	1.54E-04	1.20E-04	8.40E-05	6.36E-05	5.33E-05	7.49E-05	1.63E-04	3.74E-04	6.77E-04	6.41E-04	5.48E-04	5.08E-04	6.93E-04	6.19E-04	6.90E-04	7.55E-04	8.07E-04	9.27E-04	1.05E-03	9.53E-04	6.59E-04	4.89E-04	4.48E-04	3.84E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1196	0.1032	0.1057	0.1136	0.1159	0.2035	0.2165	0.1689	0.1674	0.1641	0.1568	0.1528	0.1924	0.1897	0.1914	0.1974	0.2031	0.2120	0.2193	0.2040	0.1801	0.1763	0.1723	0.1621
	NO2	g/vehicle/km	0.0210	0.0204	0.0210	0.0215	0.0217	0.0264	0.0273	0.0254	0.0302	0.0296	0.0279	0.0268	0.0326	0.0312	0.0324	0.0337	0.0348	0.0367	0.0386	0.0363	0.0302	0.0273	0.0263	0.0251
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0073***	***0.0051***	***0.0036***	***0.0029***	***0.0024***	***0.0050***	***0.0112***	***0.0224***	***0.0337***	***0.0320***	***0.0281***	***0.0262***	***0.0364***	***0.0337***	***0.0360***	***0.0390***	***0.0418***	***0.0470***	***0.0514***	***0.0458***	***0.0332***	***0.0267***	***0.0244***	***0.0202***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.86E-03	3.42E-03	2.41E-03	1.91E-03	1.62E-03	3.30E-03	7.50E-03	1.49E-02	2.25E-02	2.14E-02	1.88E-02	1.75E-02	2.43E-02	2.24E-02	2.40E-02	2.60E-02	2.79E-02	3.13E-02	3.42E-02	3.06E-02	2.22E-02	1.78E-02	1.63E-02	1.35E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.43E-03	1.71E-03	1.21E-03	9.56E-04	8.10E-04	1.65E-03	3.75E-03	7.47E-03	1.12E-02	1.07E-02	9.38E-03	8.74E-03	1.21E-02	1.12E-02	1.20E-02	1.30E-02	1.39E-02	1.57E-02	1.71E-02	1.53E-02	1.11E-02	8.91E-03	8.13E-03	6.74E-03
	Emission in each Box of 1st jet	g/s	9.71E-04	6.84E-04	4.82E-04	3.82E-04	3.24E-04	6.60E-04	1.50E-03	2.99E-03	4.49E-03	4.27E-03	3.75E-03	3.50E-03	4.86E-03	4.49E-03	4.80E-03	5.20E-03	5.57E-03	6.27E-03	6.85E-03	6.11E-03	4.43E-03	3.56E-03	3.25E-03	2.70E-03
	Emission in each Box of 2nd jet	g/s	8.09E-04	5.70E-04	4.02E-04	3.19E-04	2.70E-04	5.50E-04	1.25E-03	2.49E-03	3.74E-03	3.56E-03	3.13E-03	2.91E-03	4.05E-03	3.74E-03	4.00E-03	4.33E-03	4.64E-03	5.22E-03	5.71E-03	5.09E-03	3.69E-03	2.97E-03	2.71E-03	2.25E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0006***	***0.0014***	***0.0034***	***0.0061***	***0.0058***	***0.0050***	***0.0046***	***0.0062***	***0.0055***	***0.0061***	***0.0067***	***0.0072***	***0.0081***	***0.0090***	***0.0081***	***0.0056***	***0.0041***	***0.0037***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.55E-04	6.76E-04	4.79E-04	3.62E-04	3.03E-04	4.29E-04	9.45E-04	2.24E-03	4.05E-03	3.86E-03	3.34E-03	3.06E-03	4.11E-03	3.69E-03	4.07E-03	4.44E-03	4.77E-03	5.42E-03	6.03E-03	5.43E-03	3.72E-03	2.76E-03	2.48E-03	2.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.27E-04	3.38E-04	2.39E-04	1.81E-04	1.52E-04	2.14E-04	4.72E-04	1.12E-03	2.03E-03	1.93E-03	1.67E-03	1.53E-03	2.06E-03	1.84E-03	2.03E-03	2.22E-03	2.38E-03	2.71E-03	3.01E-03	2.72E-03	1.86E-03	1.38E-03	1.24E-03	1.04E-03
	Emission in each Box of 1st jet	g/s	1.71E-04	1.35E-04	9.58E-05	7.25E-05	6.07E-05	8.58E-05	1.89E-04	4.49E-04	8.11E-04	7.71E-04	6.68E-04	6.13E-04	8.23E-04	7.37E-04	8.13E-04	8.88E-04	9.54E-04	1.08E-03	1.21E-03	1.09E-03	7.45E-04	5.51E-04	4.95E-04	4.17E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	1.13E-04	7.98E-05	6.04E-05	5.06E-05	7.15E-05	1.57E-04	3.74E-04	6.76E-04	6.43E-04	5.56E-04	5.10E-04	6.86E-04	6.15E-04	6.78E-04	7.40E-04	7.95E-04	9.03E-04	1.00E-03	9.05E-04	6.21E-04	4.59E-04	4.13E-04	3.48E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1151	0.0960	0.0967	0.1026	0.1043	0.1828	0.1917	0.1445	0.1470	0.1440	0.1394	0.1378	0.1766	0.1700	0.1761	0.1797	0.1820	0.1893	0.1965	0.1854	0.1652	0.1655	0.1630	0.1550
	NO2	g/vehicle/km	0.0203	0.0191	0.0194	0.0197	0.0198	0.0240	0.0244	0.0220	0.0269	0.0263	0.0251	0.0244	0.0301	0.0282	0.0300	0.0309	0.0314	0.0329	0.0349	0.0332	0.0279	0.0257	0.0249	0.0240
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0070***	***0.0048***	***0.0033***	***0.0026***	***0.0022***	***0.0044***	***0.0100***	***0.0192***	***0.0296***	***0.0281***	***0.0250***	***0.0236***	***0.0334***	***0.0302***	***0.0331***	***0.0355***	***0.0375***	***0.0420***	***0.0460***	***0.0417***	***0.0305***	***0.0251***	***0.0231***	***0.0193***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.67E-03	3.18E-03	2.21E-03	1.73E-03	1.46E-03	2.97E-03	6.64E-03	1.28E-02	1.97E-02	1.87E-02	1.67E-02	1.58E-02	2.23E-02	2.01E-02	2.21E-02	2.37E-02	2.50E-02	2.80E-02	3.07E-02	2.78E-02	2.03E-02	1.67E-02	1.54E-02	1.29E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.34E-03	1.59E-03	1.10E-03	8.64E-04	7.30E-04	1.48E-03	3.32E-03	6.39E-03	9.86E-03	9.37E-03	8.34E-03	7.88E-03	1.11E-02	1.01E-02	1.10E-02	1.18E-02	1.25E-02	1.40E-02	1.53E-02	1.39E-02	1.02E-02	8.36E-03	7.69E-03	6.44E-03
	Emission in each Box of 1st jet	g/s	9.35E-04	6.36E-04	4.41E-04	3.46E-04	2.92E-04	5.93E-04	1.33E-03	2.56E-03	3.94E-03	3.75E-03	3.34E-03	3.15E-03	4.46E-03	4.02E-03	4.42E-03	4.73E-03	4.99E-03	5.60E-03	6.14E-03	5.55E-03	4.07E-03	3.35E-03	3.08E-03	2.58E-03
	Emission in each Box of 2nd jet	g/s	7.79E-04	5.30E-04	3.68E-04	2.88E-04	2.43E-04	4.94E-04	1.11E-03	2.13E-03	3.29E-03	3.12E-03	2.78E-03	2.63E-03	3.72E-03	3.35E-03	3.68E-03	3.94E-03	4.16E-03	4.66E-03	5.11E-03	4.63E-03	3.39E-03	2.79E-03	2.56E-03	2.15E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0029***	***0.0054***	***0.0051***	***0.0045***	***0.0042***	***0.0057***	***0.0050***	***0.0056***	***0.0061***	***0.0065***	***0.0073***	***0.0082***	***0.0075***	***0.0052***	***0.0039***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.23E-04	6.33E-04	4.43E-04	3.32E-04	2.77E-04	3.89E-04	8.44E-04	1.94E-03	3.61E-03	3.43E-03	3.00E-03	2.79E-03	3.80E-03	3.33E-03	3.76E-03	4.07E-03	4.31E-03	4.87E-03	5.45E-03	4.97E-03	3.44E-03	2.60E-03	2.35E-03	2.00E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.11E-04	3.16E-04	2.21E-04	1.66E-04	1.39E-04	1.95E-04	4.22E-04	9.72E-04	1.80E-03	1.71E-03	1.50E-03	1.39E-03	1.90E-03	1.67E-03	1.88E-03	2.03E-03	2.15E-03	2.43E-03	2.72E-03	2.48E-03	1.72E-03	1.30E-03	1.18E-03	9.99E-04
	Emission in each Box of 1st jet	g/s	1.65E-04	1.27E-04	8.86E-05	6.63E-05	5.54E-05	7.78E-05	1.69E-04	3.89E-04	7.21E-04	6.85E-04	6.00E-04	5.57E-04	7.60E-04	6.66E-04	7.52E-04	8.14E-04	8.62E-04	9.74E-04	1.09E-03	9.94E-04	6.87E-04	5.19E-04	4.70E-04	3.99E-04
	Emission in each Box of 2nd jet	g/s	1.37E-04	1.05E-04	7.38E-05	5.53E-05	4.62E-05	6.48E-05	1.41E-04	3.24E-04	6.01E-04	5.71E-04	5.00E-04	4.65E-04	6.33E-04	5.55E-04	6.27E-04	6.78E-04	7.18E-04	8.11E-04	9.08E-04	8.28E-04	5.73E-04	4.33E-04	3.92E-04	3.33E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section 103A01-103A08

Enclosure Involvec 103P1

Road Located 103

Vehicle EF Adopte 103

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1045	0.0907	0.0940	0.0989	0.1002	0.1744	0.1828	0.1422	0.1465	0.1418	0.1369	0.1327	0.1702	0.1704	0.1743	0.1793	0.1807	0.1918	0.2040	0.1883	0.1673	0.1658	0.1615	0.1570
	NO2	g/vehicle/km	0.0186	0.0182	0.0189	0.0191	0.0191	0.0230	0.0234	0.0217	0.0268	0.0259	0.0247	0.0236	0.0291	0.0282	0.0297	0.0309	0.0312	0.0334	0.0361	0.0337	0.0282	0.0257	0.0247	0.0243
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0064***	***0.0045***	***0.0032***	***0.0025***	***0.0021***	***0.0042***	***0.0095***	***0.0189***	***0.0295***	***0.0277***	***0.0246***	***0.0228***	***0.0322***	***0.0302***	***0.0328***	***0.0354***	***0.0372***	***0.0425***	***0.0478***	***0.0423***	***0.0309***	***0.0251***	***0.0229***	***0.0196***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.24E-03	3.00E-03	2.14E-03	1.67E-03	1.40E-03	2.83E-03	6.33E-03	1.26E-02	1.96E-02	1.84E-02	1.64E-02	1.52E-02	2.15E-02	2.02E-02	2.19E-02	2.36E-02	2.48E-02	2.83E-02	3.19E-02	2.82E-02	2.06E-02	1.68E-02	1.52E-02	1.30E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.12E-03	1.50E-03	1.07E-03	8.33E-04	7.01E-04	1.42E-03	3.16E-03	6.29E-03	9.82E-03	9.22E-03	8.19E-03	7.59E-03	1.07E-02	1.01E-02	1.09E-02	1.18E-02	1.24E-02	1.42E-02	1.59E-02	1.41E-02	1.03E-02	8.38E-03	7.62E-03	6.52E-03
	Emission in each Box of 1st jet	g/s	8.48E-04	6.01E-04	4.29E-04	3.33E-04	2.80E-04	5.66E-04	1.27E-03	2.52E-03	3.93E-03	3.69E-03	3.28E-03	3.04E-03	4.30E-03	4.03E-03	4.37E-03	4.72E-03	4.96E-03	5.67E-03	6.37E-03	5.64E-03	4.12E-03	3.35E-03	3.05E-03	2.61E-03
	Emission in each Box of 2nd jet	g/s	7.07E-04	5.01E-04	3.57E-04	2.78E-04	2.34E-04	4.72E-04	1.05E-03	2.10E-03	3.27E-03	3.07E-03	2.73E-03	2.53E-03	3.58E-03	3.36E-03	3.64E-03	3.93E-03	4.13E-03	4.72E-03	5.31E-03	4.70E-03	3.43E-03	2.79E-03	2.54E-03	2.17E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0029***	***0.0054***	***0.0051***	***0.0044***	***0.0040***	***0.0055***	***0.0050***	***0.0056***	***0.0061***	***0.0064***	***0.0074***	***0.0085***	***0.0076***	***0.0052***	***0.0039***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.56E-04	6.03E-04	4.32E-04	3.21E-04	2.68E-04	3.73E-04	8.09E-04	1.92E-03	3.59E-03	3.38E-03	2.95E-03	2.70E-03	3.67E-03	3.34E-03	3.73E-03	4.06E-03	4.28E-03	4.94E-03	5.63E-03	5.05E-03	3.48E-03	2.60E-03	2.33E-03	2.02E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.78E-04	3.02E-04	2.16E-04	1.61E-04	1.34E-04	1.86E-04	4.04E-04	9.58E-04	1.80E-03	1.69E-03	1.48E-03	1.35E-03	1.84E-03	1.67E-03	1.86E-03	2.03E-03	2.14E-03	2.47E-03	2.82E-03	2.52E-03	1.74E-03	1.30E-03	1.17E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	1.51E-04	1.21E-04	8.64E-05	6.43E-05	5.35E-05	7.46E-05	1.62E-04	3.83E-04	7.18E-04	6.75E-04	5.90E-04	5.39E-04	7.35E-04	6.68E-04	7.46E-04	8.13E-04	8.56E-04	9.87E-04	1.13E-03	1.01E-03	6.95E-04	5.20E-04	4.66E-04	4.05E-04
	Emission in each Box of 2nd jet	g/s	1.26E-04	1.01E-04	7.20E-05	5.36E-05	4.46E-05	6.22E-05	1.35E-04	3.19E-04	5.99E-04	5.63E-04	4.92E-04	4.49E-04	6.12E-04	5.56E-04	6.21E-04	6.77E-04	7.13E-04	8.23E-04	9.39E-04	8.42E-04	5.80E-04	4.34E-04	3.89E-04	3.37E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1022	0.0875	0.0900	0.0946	0.0944	0.1700	0.1754	0.1356	0.1386	0.1419	0.1391	0.1394	0.1766	0.1732	0.1778	0.1844	0.1791	0.1893	0.1973	0.1809	0.1564	0.1551	0.1514	0.1428
	NO2	g/vehicle/km	0.0182	0.0176	0.0182	0.0183	0.0181	0.0224	0.0224	0.0207	0.0255	0.0260	0.0250	0.0246	0.0301	0.0286	0.0303	0.0317	0.0309	0.0329	0.0350	0.0324	0.0265	0.0242	0.0233	0.0223
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0062***	***0.0043***	***0.0031***	***0.0024***	***0.0020***	***0.0041***	***0.0091***	***0.0180***	***0.0279***	***0.0277***	***0.0250***	***0.0239***	***0.0334***	***0.0307***	***0.0335***	***0.0364***	***0.0368***	***0.0420***	***0.0462***	***0.0406***	***0.0289***	***0.0235***	***0.0214***	***0.0178***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.15E-03	2.90E-03	2.05E-03	1.59E-03	1.32E-03	2.76E-03	6.07E-03	1.20E-02	1.86E-02	1.85E-02	1.66E-02	1.59E-02	2.23E-02	2.05E-02	2.23E-02	2.43E-02	2.46E-02	2.80E-02	3.08E-02	2.71E-02	1.92E-02	1.57E-02	1.43E-02	1.19E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.07E-03	1.45E-03	1.03E-03	7.97E-04	6.60E-04	1.38E-03	3.04E-03	6.00E-03	9.30E-03	9.23E-03	8.32E-03	7.97E-03	1.11E-02	1.02E-02	1.12E-02	1.21E-02	1.23E-02	1.40E-02	1.54E-02	1.35E-02	9.62E-03	7.84E-03	7.14E-03	5.94E-03
	Emission in each Box of 1st jet	g/s	8.30E-04	5.80E-04	4.11E-04	3.19E-04	2.64E-04	5.52E-04	1.21E-03	2.40E-03	3.72E-03	3.69E-03	3.33E-03	3.19E-03	4.46E-03	4.10E-03	4.46E-03	4.85E-03	4.91E-03	5.60E-03	6.16E-03	5.42E-03	3.85E-03	3.13E-03	2.86E-03	2.37E-03
	Emission in each Box of 2nd jet	g/s	6.91E-04	4.83E-04	3.42E-04	2.66E-04	2.20E-04	4.60E-04	1.01E-03	2.00E-03	3.10E-03	3.08E-03	2.77E-03	2.66E-03	3.72E-03	3.41E-03	3.72E-03	4.04E-03	4.09E-03	4.66E-03	5.13E-03	4.52E-03	3.21E-03	2.61E-03	2.38E-03	1.98E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0005***	***0.0012***	***0.0028***	***0.0051***	***0.0051***	***0.0045***	***0.0042***	***0.0057***	***0.0051***	***0.0057***	***0.0063***	***0.0064***	***0.0073***	***0.0082***	***0.0073***	***0.0049***	***0.0037***	***0.0033***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.38E-04	5.82E-04	4.15E-04	3.08E-04	2.53E-04	3.63E-04	7.77E-04	1.84E-03	3.42E-03	3.38E-03	3.00E-03	2.82E-03	3.80E-03	3.39E-03	3.80E-03	4.18E-03	4.24E-03	4.87E-03	5.46E-03	4.86E-03	3.26E-03	2.45E-03	2.20E-03	1.85E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.69E-04	2.91E-04	2.07E-04	1.54E-04	1.26E-04	1.82E-04	3.88E-04	9.18E-04	1.71E-03	1.69E-03	1.50E-03	1.41E-03	1.90E-03	1.69E-03	1.90E-03	2.09E-03	2.12E-03	2.43E-03	2.73E-03	2.43E-03	1.63E-03	1.22E-03	1.10E-03	9.27E-04
	Emission in each Box of 1st jet	g/s	1.48E-04	1.16E-04	8.30E-05	6.16E-05	5.06E-05	7.26E-05	1.55E-04	3.67E-04	6.83E-04	6.76E-04	5.99E-04	5.63E-04	7.60E-04	6.78E-04	7.59E-04	8.35E-04	8.49E-04	9.73E-04	1.09E-03	9.71E-04	6.52E-04	4.89E-04	4.39E-04	3.71E-04
	Emission in each Box of 2nd jet	g/s	1.23E-04	9.70E-05	6.91E-05	5.13E-05	4.22E-05	6.05E-05	1.29E-04	3.06E-04	5.69E-04	5.63E-04	4.99E-04	4.69E-04	6.33E-04	5.65E-04	6.33E-04	6.96E-04	7.07E-04	8.11E-04	9.11E-04	8.09E-04	5.43E-04	4.08E-04	3.66E-04	3.09E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section 103A01-103A08

Enclosure Involvec 103P1

Road Located 103

Vehicle EF Adopte 103

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1082	0.0899	0.0932	0.0998	0.1002	0.1737	0.1820	0.1349	0.1400	0.1390	0.1359	0.1333	0.1717	0.1729	0.1781	0.1819	0.1913	0.1983	0.2085	0.1914	0.1639	0.1574	0.1571	0.1503
	NO2	g/vehicle/km	0.0192	0.0181	0.0188	0.0192	0.0191	0.0229	0.0233	0.0206	0.0257	0.0255	0.0245	0.0237	0.0293	0.0286	0.0303	0.0313	0.0329	0.0345	0.0368	0.0342	0.0277	0.0246	0.0241	0.0234
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0066***	***0.0045***	***0.0032***	***0.0025***	***0.0021***	***0.0042***	***0.0095***	***0.0179***	***0.0282***	***0.0271***	***0.0244***	***0.0229***	***0.0325***	***0.0307***	***0.0335***	***0.0359***	***0.0394***	***0.0440***	***0.0488***	***0.0430***	***0.0303***	***0.0239***	***0.0222***	***0.0187***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.39E-03	2.98E-03	2.13E-03	1.68E-03	1.40E-03	2.82E-03	6.30E-03	1.19E-02	1.88E-02	1.81E-02	1.63E-02	1.52E-02	2.17E-02	2.05E-02	2.23E-02	2.39E-02	2.62E-02	2.93E-02	3.26E-02	2.87E-02	2.02E-02	1.59E-02	1.48E-02	1.25E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.20E-03	1.49E-03	1.06E-03	8.40E-04	7.01E-04	1.41E-03	3.15E-03	5.97E-03	9.39E-03	9.05E-03	8.13E-03	7.62E-03	1.08E-02	1.02E-02	1.12E-02	1.20E-02	1.31E-02	1.47E-02	1.63E-02	1.43E-02	1.01E-02	7.96E-03	7.41E-03	6.25E-03
	Emission in each Box of 1st jet	g/s	8.78E-04	5.96E-04	4.25E-04	3.36E-04	2.80E-04	5.64E-04	1.26E-03	2.39E-03	3.75E-03	3.62E-03	3.25E-03	3.05E-03	4.33E-03	4.09E-03	4.47E-03	4.79E-03	5.25E-03	5.86E-03	6.51E-03	5.73E-03	4.03E-03	3.18E-03	2.96E-03	2.50E-03
	Emission in each Box of 2nd jet	g/s	7.32E-04	4.96E-04	3.54E-04	2.80E-04	2.34E-04	4.70E-04	1.05E-03	1.99E-03	3.13E-03	3.02E-03	2.71E-03	2.54E-03	3.61E-03	3.41E-03	3.72E-03	3.99E-03	4.37E-03	4.88E-03	5.43E-03	4.78E-03	3.36E-03	2.65E-03	2.47E-03	2.08E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0027***	***0.0052***	***0.0050***	***0.0044***	***0.0041***	***0.0056***	***0.0051***	***0.0057***	***0.0062***	***0.0068***	***0.0076***	***0.0086***	***0.0077***	***0.0051***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.80E-04	5.98E-04	4.29E-04	3.24E-04	2.68E-04	3.71E-04	8.05E-04	1.83E-03	3.45E-03	3.31E-03	2.93E-03	2.71E-03	3.70E-03	3.38E-03	3.80E-03	4.12E-03	4.52E-03	5.09E-03	5.75E-03	5.13E-03	3.41E-03	2.48E-03	2.27E-03	1.94E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.90E-04	2.99E-04	2.15E-04	1.62E-04	1.34E-04	1.86E-04	4.03E-04	9.13E-04	1.72E-03	1.66E-03	1.47E-03	1.35E-03	1.85E-03	1.69E-03	1.90E-03	2.06E-03	2.26E-03	2.55E-03	2.88E-03	2.56E-03	1.71E-03	1.24E-03	1.14E-03	9.72E-04
	Emission in each Box of 1st jet	g/s	1.56E-04	1.20E-04	8.59E-05	6.48E-05	5.35E-05	7.42E-05	1.61E-04	3.65E-04	6.89E-04	6.63E-04	5.87E-04	5.41E-04	7.40E-04	6.77E-04	7.60E-04	8.23E-04	9.03E-04	1.02E-03	1.15E-03	1.03E-03	6.83E-04	4.96E-04	4.55E-04	3.89E-04
	Emission in each Box of 2nd jet	g/s	1.30E-04	9.97E-05	7.16E-05	5.40E-05	4.46E-05	6.19E-05	1.34E-04	3.04E-04	5.75E-04	5.52E-04	4.89E-04	4.51E-04	6.17E-04	5.64E-04	6.34E-04	6.86E-04	7.53E-04	8.49E-04	9.59E-04	8.54E-04	5.69E-04	4.14E-04	3.79E-04	3.24E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1074	0.0920	0.0919	0.0956	0.0997	0.1691	0.1780	0.1326	0.1338	0.1327	0.1348	0.1272	0.1688	0.1681	0.1768	0.1724	0.1720	0.1876	0.1990	0.1827	0.1638	0.1589	0.1567	0.1487
	NO2	g/vehicle/km	0.0191	0.0184	0.0186	0.0185	0.0190	0.0223	0.0227	0.0203	0.0247	0.0244	0.0243	0.0226	0.0288	0.0278	0.0301	0.0297	0.0298	0.0327	0.0353	0.0327	0.0277	0.0248	0.0240	0.0231
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0065***	***0.0046***	***0.0031***	***0.0024***	***0.0021***	***0.0041***	***0.0092***	***0.0176***	***0.0269***	***0.0259***	***0.0242***	***0.0218***	***0.0320***	***0.0298***	***0.0333***	***0.0340***	***0.0354***	***0.0416***	***0.0466***	***0.0411***	***0.0302***	***0.0241***	***0.0222***	***0.0185***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.36E-03	3.05E-03	2.10E-03	1.61E-03	1.39E-03	2.74E-03	6.16E-03	1.17E-02	1.79E-02	1.73E-02	1.61E-02	1.46E-02	2.13E-02	1.99E-02	2.22E-02	2.27E-02	2.36E-02	2.77E-02	3.11E-02	2.74E-02	2.02E-02	1.61E-02	1.48E-02	1.24E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.18E-03	1.52E-03	1.05E-03	8.05E-04	6.97E-04	1.37E-03	3.08E-03	5.87E-03	8.97E-03	8.64E-03	8.06E-03	7.28E-03	1.07E-02	9.94E-03	1.11E-02	1.13E-02	1.18E-02	1.39E-02	1.55E-02	1.37E-02	1.01E-02	8.03E-03	7.39E-03	6.18E-03
	Emission in each Box of 1st jet	g/s	8.72E-04	6.10E-04	4.19E-04	3.22E-04	2.79E-04	5.49E-04	1.23E-03	2.35E-03	3.59E-03	3.45E-03	3.22E-03	2.91E-03	4.26E-03	3.98E-03	4.44E-03	4.54E-03	4.72E-03	5.55E-03	6.22E-03	5.47E-03	4.03E-03	3.21E-03	2.96E-03	2.47E-03
	Emission in each Box of 2nd jet	g/s	7.27E-04	5.08E-04	3.49E-04	2.68E-04	2.32E-04	4.57E-04	1.03E-03	1.96E-03	2.99E-03	2.88E-03	2.69E-03	2.43E-03	3.55E-03	3.31E-03	3.70E-03	3.78E-03	3.93E-03	4.62E-03	5.18E-03	4.56E-03	3.36E-03	2.68E-03	2.46E-03	2.06E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0005***	***0.0012***	***0.0027***	***0.0050***	***0.0048***	***0.0044***	***0.0039***	***0.0055***	***0.0049***	***0.0057***	***0.0059***	***0.0061***	***0.0072***	***0.0083***	***0.0074***	***0.0051***	***0.0038***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.74E-04	6.11E-04	4.24E-04	3.11E-04	2.66E-04	3.61E-04	7.87E-04	1.80E-03	3.31E-03	3.18E-03	2.91E-03	2.58E-03	3.64E-03	3.29E-03	3.78E-03	3.92E-03	4.09E-03	4.83E-03	5.51E-03	4.90E-03	3.41E-03	2.50E-03	2.27E-03	1.92E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.87E-04	3.05E-04	2.12E-04	1.55E-04	1.33E-04	1.81E-04	3.94E-04	8.99E-04	1.66E-03	1.59E-03	1.46E-03	1.29E-03	1.82E-03	1.65E-03	1.89E-03	1.96E-03	2.04E-03	2.41E-03	2.75E-03	2.45E-03	1.70E-03	1.25E-03	1.13E-03	9.62E-04
	Emission in each Box of 1st jet	g/s	1.55E-04	1.22E-04	8.47E-05	6.21E-05	5.32E-05	7.23E-05	1.57E-04	3.60E-04	6.62E-04	6.35E-04	5.82E-04	5.17E-04	7.28E-04	6.59E-04	7.55E-04	7.83E-04	8.17E-04	9.66E-04	1.10E-03	9.81E-04	6.82E-04	5.01E-04	4.54E-04	3.85E-04
	Emission in each Box of 2nd jet	g/s	1.29E-04	1.02E-04	7.06E-05	5.18E-05	4.44E-05	6.02E-05	1.31E-04	3.00E-04	5.52E-04	5.29E-04	4.85E-04	4.30E-04	6.07E-04	5.49E-04	6.29E-04	6.53E-04	6.81E-04	8.05E-04	9.18E-04	8.17E-04	5.68E-04	4.17E-04	3.78E-04	3.21E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1230	0.1069	0.1074	0.1136	0.1159	0.2049	0.2134	0.1596	0.1607	0.1572	0.1513	0.1498	0.1932	0.1881	0.1908	0.1988	0.1988	0.2110	0.2238	0.2070	0.1846	0.1791	0.1782	0.1722
	NO2	g/vehicle/km	0.0215	0.0209	0.0213	0.0215	0.0217	0.0266	0.0269	0.0240	0.0290	0.0284	0.0270	0.0263	0.0327	0.0309	0.0323	0.0339	0.0341	0.0365	0.0393	0.0368	0.0309	0.0276	0.0270	0.0265
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0075***	***0.0053***	***0.0037***	***0.0029***	***0.0024***	***0.0050***	***0.0111***	***0.0212***	***0.0323***	***0.0307***	***0.0272***	***0.0257***	***0.0366***	***0.0334***	***0.0359***	***0.0393***	***0.0409***	***0.0468***	***0.0524***	***0.0465***	***0.0341***	***0.0272***	***0.0252***	***0.0215***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.99E-03	3.54E-03	2.45E-03	1.91E-03	1.62E-03	3.32E-03	7.39E-03	1.41E-02	2.15E-02	2.05E-02	1.81E-02	1.71E-02	2.44E-02	2.22E-02	2.39E-02	2.62E-02	2.73E-02	3.12E-02	3.49E-02	3.10E-02	2.27E-02	1.81E-02	1.68E-02	1.43E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.50E-03	1.77E-03	1.22E-03	9.56E-04	8.11E-04	1.66E-03	3.69E-03	7.06E-03	1.08E-02	1.02E-02	9.05E-03	8.57E-03	1.22E-02	1.11E-02	1.20E-02	1.31E-02	1.36E-02	1.56E-02	1.75E-02	1.55E-02	1.14E-02	9.05E-03	8.41E-03	7.16E-03
	Emission in each Box of 1st jet	g/s	9.99E-04	7.09E-04	4.90E-04	3.82E-04	3.24E-04	6.65E-04	1.48E-03	2.82E-03	4.31E-03	4.09E-03	3.62E-03	3.43E-03	4.88E-03	4.45E-03	4.79E-03	5.23E-03	5.45E-03	6.24E-03	6.99E-03	6.20E-03	4.54E-03	3.62E-03	3.36E-03	2.86E-03
	Emission in each Box of 2nd jet	g/s	8.32E-04	5.90E-04	4.08E-04	3.19E-04	2.70E-04	5.54E-04	1.23E-03	2.35E-03	3.59E-03	3.41E-03	3.02E-03	2.86E-03	4.07E-03	3.71E-03	3.99E-03	4.36E-03	4.55E-03	5.20E-03	5.82E-03	5.17E-03	3.79E-03	3.02E-03	2.80E-03	2.39E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0006***	***0.0014***	***0.0032***	***0.0058***	***0.0056***	***0.0048***	***0.0045***	***0.0062***	***0.0055***	***0.0061***	***0.0067***	***0.0070***	***0.0081***	***0.0092***	***0.0083***	***0.0057***	***0.0042***	***0.0038***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.73E-04	6.94E-04	4.85E-04	3.62E-04	3.03E-04	4.31E-04	9.31E-04	2.12E-03	3.89E-03	3.70E-03	3.23E-03	3.01E-03	4.13E-03	3.65E-03	4.05E-03	4.47E-03	4.67E-03	5.39E-03	6.13E-03	5.51E-03	3.80E-03	2.79E-03	2.55E-03	2.20E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.37E-04	3.47E-04	2.42E-04	1.81E-04	1.52E-04	2.15E-04	4.65E-04	1.06E-03	1.95E-03	1.85E-03	1.62E-03	1.50E-03	2.06E-03	1.83E-03	2.03E-03	2.23E-03	2.34E-03	2.69E-03	3.06E-03	2.75E-03	1.90E-03	1.40E-03	1.28E-03	1.10E-03
	Emission in each Box of 1st jet	g/s	1.75E-04	1.39E-04	9.70E-05	7.24E-05	6.06E-05	8.62E-05	1.86E-04	4.25E-04	7.79E-04	7.40E-04	6.47E-04	6.01E-04	8.25E-04	7.31E-04	8.10E-04	8.93E-04	9.34E-04	1.08E-03	1.23E-03	1.10E-03	7.60E-04	5.59E-04	5.10E-04	4.40E-04
	Emission in each Box of 2nd jet	g/s	1.46E-04	1.16E-04	8.08E-05	6.03E-05	5.05E-05	7.18E-05	1.55E-04	3.54E-04	6.49E-04	6.17E-04	5.39E-04	5.01E-04	6.88E-04	6.09E-04	6.75E-04	7.44E-04	7.79E-04	8.98E-04	1.02E-03	9.18E-04	6.33E-04	4.65E-04	4.25E-04	3.67E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1352	0.1151	0.1176	0.1249	0.1272	0.2221	0.2338	0.1731	0.1746	0.1703	0.1646	0.1604	0.2075	0.2040	0.2078	0.2129	0.2136	0.2253	0.2387	0.2249	0.1981	0.1959	0.1938	0.1862
	NO2	g/vehicle/km	0.0234	0.0224	0.0229	0.0233	0.0235	0.0286	0.0293	0.0259	0.0313	0.0305	0.0290	0.0278	0.0348	0.0332	0.0348	0.0361	0.0363	0.0387	0.0416	0.0396	0.0329	0.0299	0.0292	0.0284
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0082***	***0.0057***	***0.0040***	***0.0032***	***0.0027***	***0.0054***	***0.0121***	***0.0230***	***0.0351***	***0.0332***	***0.0295***	***0.0275***	***0.0393***	***0.0362***	***0.0391***	***0.0420***	***0.0440***	***0.0499***	***0.0559***	***0.0505***	***0.0366***	***0.0297***	***0.0274***	***0.0232***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.49E-03	3.81E-03	2.68E-03	2.10E-03	1.78E-03	3.60E-03	8.10E-03	1.53E-02	2.34E-02	2.22E-02	1.97E-02	1.83E-02	2.62E-02	2.41E-02	2.61E-02	2.80E-02	2.93E-02	3.33E-02	3.73E-02	3.37E-02	2.44E-02	1.98E-02	1.83E-02	1.55E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.74E-03	1.91E-03	1.34E-03	1.05E-03	8.89E-04	1.80E-03	4.05E-03	7.66E-03	1.17E-02	1.11E-02	9.85E-03	9.17E-03	1.31E-02	1.21E-02	1.30E-02	1.40E-02	1.47E-02	1.66E-02	1.86E-02	1.68E-02	1.22E-02	9.90E-03	9.14E-03	7.74E-03
	Emission in each Box of 1st jet	g/s	1.10E-03	7.63E-04	5.36E-04	4.21E-04	3.56E-04	7.21E-04	1.62E-03	3.06E-03	4.68E-03	4.43E-03	3.94E-03	3.67E-03	5.24E-03	4.83E-03	5.22E-03	5.61E-03	5.86E-03	6.66E-03	7.45E-03	6.74E-03	4.88E-03	3.96E-03	3.66E-03	3.10E-03
	Emission in each Box of 2nd jet	g/s	9.15E-04	6.36E-04	4.47E-04	3.51E-04	2.96E-04	6.01E-04	1.35E-03	2.55E-03	3.90E-03	3.69E-03	3.28E-03	3.06E-03	4.37E-03	4.02E-03	4.35E-03	4.67E-03	4.88E-03	5.55E-03	6.21E-03	5.62E-03	4.06E-03	3.30E-03	3.05E-03	2.58E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0034***	***0.0063***	***0.0060***	***0.0052***	***0.0048***	***0.0066***	***0.0059***	***0.0066***	***0.0071***	***0.0075***	***0.0086***	***0.0097***	***0.0089***	***0.0061***	***0.0045***	***0.0041***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.48E-04	7.41E-04	5.23E-04	3.92E-04	3.28E-04	4.64E-04	1.01E-03	2.29E-03	4.19E-03	3.98E-03	3.47E-03	3.19E-03	4.39E-03	3.92E-03	4.37E-03	4.75E-03	4.98E-03	5.71E-03	6.50E-03	5.93E-03	4.05E-03	3.03E-03	2.75E-03	2.36E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.74E-04	3.71E-04	2.62E-04	1.96E-04	1.64E-04	2.32E-04	5.06E-04	1.14E-03	2.10E-03	1.99E-03	1.74E-03	1.59E-03	2.20E-03	1.96E-03	2.19E-03	2.37E-03	2.49E-03	2.86E-03	3.25E-03	2.97E-03	2.02E-03	1.51E-03	1.38E-03	1.18E-03
	Emission in each Box of 1st jet	g/s	1.90E-04	1.48E-04	1.05E-04	7.85E-05	6.57E-05	9.29E-05	2.03E-04	4.58E-04	8.39E-04	7.95E-04	6.95E-04	6.37E-04	8.78E-04	7.84E-04	8.74E-04	9.50E-04	9.96E-04	1.14E-03	1.30E-03	1.19E-03	8.10E-04	6.05E-04	5.51E-04	4.72E-04
	Emission in each Box of 2nd jet	g/s	1.58E-04	1.24E-04	8.72E-05	6.54E-05	5.47E-05	7.74E-05	1.69E-04	3.82E-04	6.99E-04	6.63E-04	5.79E-04	5.31E-04	7.32E-04	6.54E-04	7.29E-04	7.91E-04	8.30E-04	9.52E-04	1.08E-03	9.89E-04	6.75E-04	5.05E-04	4.59E-04	3.93E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1411	0.1211	0.1236	0.1315	0.1332	0.2297	0.2419	0.1804	0.1807	0.1761	0.1701	0.1670	0.2144	0.2094	0.2136	0.2194	0.2215	0.2360	0.2471	0.2326	0.2053	0.2029	0.2010	0.1939
	NO2	g/vehicle/km	0.0241	0.0232	0.0237	0.0242	0.0242	0.0294	0.0300	0.0267	0.0321	0.0312	0.0297	0.0287	0.0356	0.0339	0.0356	0.0369	0.0374	0.0402	0.0428	0.0406	0.0338	0.0308	0.0300	0.0293
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0086***	***0.0060***	***0.0042***	***0.0033***	***0.0028***	***0.0056***	***0.0126***	***0.0239***	***0.0364***	***0.0344***	***0.0305***	***0.0287***	***0.0406***	***0.0372***	***0.0402***	***0.0433***	***0.0456***	***0.0523***	***0.0579***	***0.0523***	***0.0379***	***0.0308***	***0.0285***	***0.0242***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.73E-03	4.01E-03	2.82E-03	2.21E-03	1.86E-03	3.73E-03	8.38E-03	1.60E-02	2.42E-02	2.29E-02	2.04E-02	1.91E-02	2.71E-02	2.48E-02	2.68E-02	2.89E-02	3.04E-02	3.49E-02	3.86E-02	3.48E-02	2.53E-02	2.05E-02	1.90E-02	1.61E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.86E-03	2.01E-03	1.41E-03	1.11E-03	9.32E-04	1.86E-03	4.19E-03	7.98E-03	1.21E-02	1.15E-02	1.02E-02	9.55E-03	1.35E-02	1.24E-02	1.34E-02	1.44E-02	1.52E-02	1.74E-02	1.93E-02	1.74E-02	1.26E-02	1.03E-02	9.48E-03	8.06E-03
	Emission in each Box of 1st jet	g/s	1.15E-03	8.02E-04	5.64E-04	4.43E-04	3.73E-04	7.45E-04	1.68E-03	3.19E-03	4.85E-03	4.58E-03	4.07E-03	3.82E-03	5.41E-03	4.95E-03	5.36E-03	5.78E-03	6.08E-03	6.98E-03	7.72E-03	6.97E-03	5.05E-03	4.10E-03	3.79E-03	3.22E-03
	Emission in each Box of 2nd jet	g/s	9.55E-04	6.69E-04	4.70E-04	3.69E-04	3.11E-04	6.21E-04	1.40E-03	2.66E-03	4.04E-03	3.82E-03	3.39E-03	3.18E-03	4.51E-03	4.13E-03	4.47E-03	4.81E-03	5.06E-03	5.81E-03	6.43E-03	5.81E-03	4.21E-03	3.42E-03	3.16E-03	2.69E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0016***	***0.0035***	***0.0064***	***0.0061***	***0.0053***	***0.0049***	***0.0068***	***0.0060***	***0.0067***	***0.0073***	***0.0077***	***0.0089***	***0.0100***	***0.0091***	***0.0062***	***0.0047***	***0.0042***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.80E-04	7.68E-04	5.41E-04	4.07E-04	3.39E-04	4.77E-04	1.04E-03	2.36E-03	4.30E-03	4.06E-03	3.56E-03	3.28E-03	4.50E-03	4.01E-03	4.47E-03	4.86E-03	5.13E-03	5.93E-03	6.68E-03	6.08E-03	4.16E-03	3.11E-03	2.83E-03	2.44E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.90E-04	3.84E-04	2.71E-04	2.03E-04	1.70E-04	2.38E-04	5.20E-04	1.18E-03	2.15E-03	2.03E-03	1.78E-03	1.64E-03	2.25E-03	2.00E-03	2.23E-03	2.43E-03	2.57E-03	2.97E-03	3.34E-03	3.04E-03	2.08E-03	1.56E-03	1.42E-03	1.22E-03
	Emission in each Box of 1st jet	g/s	1.96E-04	1.54E-04	1.08E-04	8.14E-05	6.78E-05	9.54E-05	2.08E-04	4.72E-04	8.60E-04	8.13E-04	7.11E-04	6.56E-04	9.00E-04	8.01E-04	8.93E-04	9.72E-04	1.03E-03	1.19E-03	1.34E-03	1.22E-03	8.33E-04	6.22E-04	5.66E-04	4.88E-04
	Emission in each Box of 2nd jet	g/s	1.63E-04	1.28E-04	9.02E-05	6.78E-05	5.65E-05	7.95E-05	1.73E-04	3.93E-04	7.17E-04	6.77E-04	5.93E-04	5.47E-04	7.50E-04	6.68E-04	7.44E-04	8.10E-04	8.55E-04	9.89E-04	1.11E-03	1.01E-03	6.94E-04	5.19E-04	4.72E-04	4.06E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1458	0.1243	0.1268	0.1327	0.1354	0.2499	0.2648	0.2020	0.2395	0.2261	0.2066	0.2019	0.1638	0.1602	0.1641	0.1698	0.1736	0.1843	0.1952	0.1856	0.1577	0.1462	0.1428	0.1399
	NO2	g/vehicle/km	0.0238	0.0228	0.0231	0.0237	0.0239	0.0300	0.0307	0.0290	0.0424	0.0401	0.0361	0.0348	0.0319	0.0307	0.0320	0.0332	0.0339	0.0364	0.0390	0.0370	0.0303	0.0270	0.0261	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0168***	***0.0117***	***0.0082***	***0.0063***	***0.0054***	***0.0117***	***0.0263***	***0.0509***	***0.0912***	***0.0835***	***0.0702***	***0.0656***	***0.0472***	***0.0431***	***0.0470***	***0.0510***	***0.0544***	***0.0622***	***0.0698***	***0.0638***	***0.0443***	***0.0334***	***0.0306***	***0.0266***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.12E-02	7.78E-03	5.46E-03	4.22E-03	3.60E-03	7.79E-03	1.76E-02	3.40E-02	6.08E-02	5.57E-02	4.68E-02	4.37E-02	3.15E-02	2.88E-02	3.13E-02	3.40E-02	3.62E-02	4.15E-02	4.65E-02	4.25E-02	2.95E-02	2.23E-02	2.04E-02	1.77E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.60E-03	3.89E-03	2.73E-03	2.11E-03	1.80E-03	3.89E-03	8.78E-03	1.70E-02	3.04E-02	2.78E-02	2.34E-02	2.19E-02	1.57E-02	1.44E-02	1.57E-02	1.70E-02	1.81E-02	2.07E-02	2.33E-02	2.13E-02	1.48E-02	1.11E-02	1.02E-02	8.87E-03
	Emission in each Box of 1st jet	g/s	2.24E-03	1.56E-03	1.09E-03	8.44E-04	7.20E-04	1.56E-03	3.51E-03	6.79E-03	1.22E-02	1.11E-02	9.35E-03	8.75E-03	6.29E-03	5.75E-03	6.26E-03	6.81E-03	7.25E-03	8.30E-03	9.30E-03	8.50E-03	5.90E-03	4.46E-03	4.08E-03	3.55E-03
	Emission in each Box of 2nd jet	g/s	1.87E-03	1.30E-03	9.10E-04	7.03E-04	6.00E-04	1.30E-03	2.93E-03	5.66E-03	1.01E-02	9.28E-03	7.79E-03	7.29E-03	5.25E-03	4.79E-03	5.22E-03	5.67E-03	6.04E-03	6.92E-03	7.75E-03	7.08E-03	4.92E-03	3.71E-03	3.40E-03	2.96E-03
NO_2 Emission Rate		g/s	***0.0027***	***0.0021***	***0.0015***	***0.0011***	***0.0010***	***0.0014***	***0.0030***	***0.0073***	***0.0162***	***0.0148***	***0.0123***	***0.0113***	***0.0092***	***0.0083***	***0.0091***	***0.0100***	***0.0106***	***0.0123***	***0.0139***	***0.0127***	***0.0085***	***0.0062***	***0.0056***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.83E-03	1.43E-03	9.96E-04	7.55E-04	6.36E-04	9.36E-04	2.03E-03	4.87E-03	1.08E-02	9.87E-03	8.18E-03	7.54E-03	6.13E-03	5.52E-03	6.10E-03	6.66E-03	7.08E-03	8.20E-03	9.30E-03	8.49E-03	5.67E-03	4.11E-03	3.72E-03	3.25E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.15E-04	7.15E-04	4.98E-04	3.77E-04	3.18E-04	4.68E-04	1.02E-03	2.44E-03	5.38E-03	4.94E-03	4.09E-03	3.77E-03	3.06E-03	2.76E-03	3.05E-03	3.33E-03	3.54E-03	4.10E-03	4.65E-03	4.24E-03	2.84E-03	2.06E-03	1.86E-03	1.62E-03
	Emission in each Box of 1st jet	g/s	3.66E-04	2.86E-04	1.99E-04	1.51E-04	1.27E-04	1.87E-04	4.07E-04	9.74E-04	2.15E-03	1.97E-03	1.64E-03	1.51E-03	1.23E-03	1.10E-03	1.22E-03	1.33E-03	1.42E-03	1.64E-03	1.86E-03	1.70E-03	1.13E-03	8.23E-04	7.45E-04	6.49E-04
	Emission in each Box of 2nd jet	g/s	3.05E-04	2.38E-04	1.66E-04	1.26E-04	1.06E-04	1.56E-04	3.39E-04	8.12E-04	1.79E-03	1.65E-03	1.36E-03	1.26E-03	1.02E-03	9.19E-04	1.02E-03	1.11E-03	1.18E-03	1.37E-03	1.55E-03	1.41E-03	9.46E-04	6.86E-04	6.21E-04	5.41E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1321	0.1119	0.1137	0.1198	0.1257	0.2359	0.2515	0.1895	0.2252	0.2156	0.1976	0.1921	0.1551	0.1496	0.1544	0.1602	0.1637	0.1718	0.1774	0.1685	0.1422	0.1322	0.1292	0.1264
	NO2	g/vehicle/km	0.0221	0.0211	0.0213	0.0220	0.0227	0.0287	0.0294	0.0276	0.0405	0.0386	0.0349	0.0335	0.0306	0.0292	0.0305	0.0318	0.0325	0.0344	0.0361	0.0342	0.0279	0.0248	0.0241	0.0236
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0152***	***0.0105***	***0.0073***	***0.0057***	***0.0050***	***0.0110***	***0.0250***	***0.0478***	***0.0857***	***0.0797***	***0.0671***	***0.0624***	***0.0447***	***0.0403***	***0.0442***	***0.0482***	***0.0513***	***0.0580***	***0.0634***	***0.0579***	***0.0399***	***0.0302***	***0.0277***	***0.0240***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.01E-02	7.01E-03	4.90E-03	3.81E-03	3.35E-03	7.35E-03	1.67E-02	3.19E-02	5.71E-02	5.31E-02	4.47E-02	4.16E-02	2.98E-02	2.69E-02	2.95E-02	3.21E-02	3.42E-02	3.87E-02	4.23E-02	3.86E-02	2.66E-02	2.02E-02	1.85E-02	1.60E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.07E-03	3.50E-03	2.45E-03	1.90E-03	1.67E-03	3.68E-03	8.33E-03	1.59E-02	2.86E-02	2.66E-02	2.24E-02	2.08E-02	1.49E-02	1.34E-02	1.47E-02	1.61E-02	1.71E-02	1.93E-02	2.11E-02	1.93E-02	1.33E-02	1.01E-02	9.24E-03	8.01E-03
	Emission in each Box of 1st jet	g/s	2.03E-03	1.40E-03	9.79E-04	7.61E-04	6.69E-04	1.47E-03	3.33E-03	6.37E-03	1.14E-02	1.06E-02	8.94E-03	8.32E-03	5.96E-03	5.37E-03	5.89E-03	6.42E-03	6.84E-03	7.74E-03	8.46E-03	7.72E-03	5.32E-03	4.03E-03	3.70E-03	3.20E-03
	Emission in each Box of 2nd jet	g/s	1.69E-03	1.17E-03	8.16E-04	6.35E-04	5.58E-04	1.23E-03	2.78E-03	5.31E-03	9.52E-03	8.85E-03	7.45E-03	6.93E-03	4.97E-03	4.48E-03	4.91E-03	5.35E-03	5.70E-03	6.45E-03	7.05E-03	6.43E-03	4.43E-03	3.36E-03	3.08E-03	2.67E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0020***	***0.0014***	***0.0010***	***0.0009***	***0.0013***	***0.0029***	***0.0070***	***0.0154***	***0.0143***	***0.0118***	***0.0109***	***0.0088***	***0.0079***	***0.0087***	***0.0096***	***0.0102***	***0.0116***	***0.0129***	***0.0118***	***0.0078***	***0.0057***	***0.0052***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.69E-03	1.32E-03	9.17E-04	6.98E-04	6.04E-04	8.94E-04	1.95E-03	4.64E-03	1.03E-02	9.51E-03	7.90E-03	7.25E-03	5.87E-03	5.24E-03	5.82E-03	6.37E-03	6.78E-03	7.75E-03	8.60E-03	7.84E-03	5.23E-03	3.79E-03	3.44E-03	2.99E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.47E-04	6.60E-04	4.58E-04	3.49E-04	3.02E-04	4.47E-04	9.74E-04	2.32E-03	5.14E-03	4.75E-03	3.95E-03	3.63E-03	2.94E-03	2.62E-03	2.91E-03	3.19E-03	3.39E-03	3.87E-03	4.30E-03	3.92E-03	2.61E-03	1.89E-03	1.72E-03	1.50E-03
	Emission in each Box of 1st jet	g/s	3.39E-04	2.64E-04	1.83E-04	1.40E-04	1.21E-04	1.79E-04	3.90E-04	9.28E-04	2.05E-03	1.90E-03	1.58E-03	1.45E-03	1.17E-03	1.05E-03	1.16E-03	1.27E-03	1.36E-03	1.55E-03	1.72E-03	1.57E-03	1.05E-03	7.58E-04	6.88E-04	5.99E-04
	Emission in each Box of 2nd jet	g/s	2.82E-04	2.20E-04	1.53E-04	1.16E-04	1.01E-04	1.49E-04	3.25E-04	7.73E-04	1.71E-03	1.58E-03	1.32E-03	1.21E-03	9.79E-04	8.73E-04	9.70E-04	1.06E-03	1.13E-03	1.29E-03	1.43E-03	1.31E-03	8.71E-04	6.31E-04	5.74E-04	4.99E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1333	0.1117	0.1137	0.1198	0.1232	0.2301	0.2432	0.1865	0.2210	0.2091	0.1870	0.1821	0.1467	0.1435	0.1469	0.1526	0.1567	0.1662	0.1762	0.1686	0.1440	0.1324	0.1317	0.1293
	NO2	g/vehicle/km	0.0223	0.0211	0.0213	0.0221	0.0223	0.0280	0.0286	0.0272	0.0398	0.0375	0.0332	0.0320	0.0292	0.0282	0.0292	0.0306	0.0313	0.0335	0.0359	0.0342	0.0283	0.0250	0.0245	0.0242
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0154***	***0.0105***	***0.0073***	***0.0057***	***0.0049***	***0.0108***	***0.0242***	***0.0470***	***0.0841***	***0.0773***	***0.0635***	***0.0592***	***0.0423***	***0.0386***	***0.0421***	***0.0459***	***0.0491***	***0.0561***	***0.0630***	***0.0579***	***0.0404***	***0.0303***	***0.0282***	***0.0246***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.02E-02	6.99E-03	4.89E-03	3.81E-03	3.28E-03	7.17E-03	1.61E-02	3.13E-02	5.61E-02	5.15E-02	4.23E-02	3.94E-02	2.82E-02	2.58E-02	2.80E-02	3.06E-02	3.27E-02	3.74E-02	4.20E-02	3.86E-02	2.69E-02	2.02E-02	1.88E-02	1.64E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.12E-03	3.50E-03	2.45E-03	1.90E-03	1.64E-03	3.59E-03	8.06E-03	1.57E-02	2.80E-02	2.58E-02	2.12E-02	1.97E-02	1.41E-02	1.29E-02	1.40E-02	1.53E-02	1.64E-02	1.87E-02	2.10E-02	1.93E-02	1.35E-02	1.01E-02	9.41E-03	8.20E-03
	Emission in each Box of 1st jet	g/s	2.05E-03	1.40E-03	9.79E-04	7.62E-04	6.56E-04	1.43E-03	3.22E-03	6.27E-03	1.12E-02	1.03E-02	8.47E-03	7.89E-03	5.64E-03	5.15E-03	5.61E-03	6.11E-03	6.54E-03	7.48E-03	8.40E-03	7.72E-03	5.39E-03	4.04E-03	3.77E-03	3.28E-03
	Emission in each Box of 2nd jet	g/s	1.71E-03	1.17E-03	8.16E-04	6.35E-04	5.46E-04	1.20E-03	2.69E-03	5.22E-03	9.35E-03	8.58E-03	7.06E-03	6.57E-03	4.70E-03	4.29E-03	4.67E-03	5.10E-03	5.45E-03	6.24E-03	7.00E-03	6.44E-03	4.49E-03	3.36E-03	3.14E-03	2.73E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0011***	***0.0009***	***0.0013***	***0.0028***	***0.0068***	***0.0151***	***0.0139***	***0.0113***	***0.0104***	***0.0084***	***0.0076***	***0.0084***	***0.0092***	***0.0098***	***0.0113***	***0.0128***	***0.0118***	***0.0079***	***0.0057***	***0.0053***	***0.0046***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.71E-03	1.32E-03	9.18E-04	7.02E-04	5.94E-04	8.74E-04	1.89E-03	4.57E-03	1.01E-02	9.25E-03	7.52E-03	6.93E-03	5.61E-03	5.06E-03	5.58E-03	6.13E-03	6.54E-03	7.54E-03	8.56E-03	7.84E-03	5.30E-03	3.81E-03	3.51E-03	3.06E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.55E-04	6.59E-04	4.59E-04	3.51E-04	2.97E-04	4.37E-04	9.47E-04	2.28E-03	5.05E-03	4.62E-03	3.76E-03	3.46E-03	2.80E-03	2.53E-03	2.79E-03	3.06E-03	3.27E-03	3.77E-03	4.28E-03	3.92E-03	2.65E-03	1.90E-03	1.75E-03	1.53E-03
	Emission in each Box of 1st jet	g/s	3.42E-04	2.64E-04	1.84E-04	1.40E-04	1.19E-04	1.75E-04	3.79E-04	9.13E-04	2.02E-03	1.85E-03	1.50E-03	1.39E-03	1.12E-03	1.01E-03	1.12E-03	1.23E-03	1.31E-03	1.51E-03	1.71E-03	1.57E-03	1.06E-03	7.61E-04	7.01E-04	6.12E-04
	Emission in each Box of 2nd jet	g/s	2.85E-04	2.20E-04	1.53E-04	1.17E-04	9.91E-05	1.46E-04	3.16E-04	7.61E-04	1.68E-03	1.54E-03	1.25E-03	1.15E-03	9.34E-04	8.43E-04	9.30E-04	1.02E-03	1.09E-03	1.26E-03	1.43E-03	1.31E-03	8.83E-04	6.34E-04	5.84E-04	5.10E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1219	0.1035	0.1064	0.1121	0.1155	0.2184	0.2347	0.1861	0.2195	0.2085	0.1893	0.1823	0.1445	0.1418	0.1436	0.1492	0.1537	0.1607	0.1680	0.1585	0.1340	0.1230	0.1196	0.1150
	NO2	g/vehicle/km	0.0206	0.0198	0.0202	0.0209	0.0212	0.0268	0.0277	0.0272	0.0397	0.0376	0.0338	0.0322	0.0289	0.0280	0.0287	0.0300	0.0308	0.0326	0.0345	0.0325	0.0266	0.0234	0.0226	0.0218
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0140***	***0.0097***	***0.0069***	***0.0053***	***0.0046***	***0.0102***	***0.0233***	***0.0469***	***0.0835***	***0.0770***	***0.0643***	***0.0592***	***0.0417***	***0.0382***	***0.0411***	***0.0449***	***0.0481***	***0.0543***	***0.0601***	***0.0545***	***0.0376***	***0.0281***	***0.0256***	***0.0219***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.36E-03	6.48E-03	4.58E-03	3.56E-03	3.07E-03	6.81E-03	1.56E-02	3.13E-02	5.57E-02	5.14E-02	4.29E-02	3.95E-02	2.78E-02	2.55E-02	2.74E-02	2.99E-02	3.21E-02	3.62E-02	4.00E-02	3.63E-02	2.51E-02	1.87E-02	1.71E-02	1.46E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.68E-03	3.24E-03	2.29E-03	1.78E-03	1.54E-03	3.40E-03	7.78E-03	1.56E-02	2.78E-02	2.57E-02	2.14E-02	1.97E-02	1.39E-02	1.27E-02	1.37E-02	1.50E-02	1.60E-02	1.81E-02	2.00E-02	1.82E-02	1.25E-02	9.37E-03	8.55E-03	7.29E-03
	Emission in each Box of 1st jet	g/s	1.87E-03	1.30E-03	9.17E-04	7.13E-04	6.15E-04	1.36E-03	3.11E-03	6.26E-03	1.11E-02	1.03E-02	8.57E-03	7.90E-03	5.55E-03	5.09E-03	5.48E-03	5.98E-03	6.42E-03	7.23E-03	8.01E-03	7.26E-03	5.01E-03	3.75E-03	3.42E-03	2.92E-03
	Emission in each Box of 2nd jet	g/s	1.56E-03	1.08E-03	7.64E-04	5.94E-04	5.12E-04	1.13E-03	2.59E-03	5.21E-03	9.28E-03	8.56E-03	7.14E-03	6.58E-03	4.63E-03	4.24E-03	4.57E-03	4.98E-03	5.35E-03	6.03E-03	6.67E-03	6.05E-03	4.18E-03	3.12E-03	2.85E-03	2.43E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0013***	***0.0027***	***0.0069***	***0.0151***	***0.0139***	***0.0115***	***0.0104***	***0.0083***	***0.0075***	***0.0082***	***0.0090***	***0.0097***	***0.0110***	***0.0123***	***0.0112***	***0.0075***	***0.0054***	***0.0048***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.59E-03	1.24E-03	8.71E-04	6.64E-04	5.63E-04	8.34E-04	1.83E-03	4.57E-03	1.01E-02	9.26E-03	7.64E-03	6.96E-03	5.55E-03	5.02E-03	5.48E-03	6.01E-03	6.44E-03	7.34E-03	8.23E-03	7.45E-03	4.98E-03	3.57E-03	3.23E-03	2.77E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.93E-04	6.21E-04	4.36E-04	3.32E-04	2.82E-04	4.17E-04	9.17E-04	2.29E-03	5.03E-03	4.63E-03	3.82E-03	3.48E-03	2.77E-03	2.51E-03	2.74E-03	3.00E-03	3.22E-03	3.67E-03	4.12E-03	3.72E-03	2.49E-03	1.79E-03	1.61E-03	1.38E-03
	Emission in each Box of 1st jet	g/s	3.17E-04	2.48E-04	1.74E-04	1.33E-04	1.13E-04	1.67E-04	3.67E-04	9.15E-04	2.01E-03	1.85E-03	1.53E-03	1.39E-03	1.11E-03	1.00E-03	1.10E-03	1.20E-03	1.29E-03	1.47E-03	1.65E-03	1.49E-03	9.97E-04	7.14E-04	6.46E-04	5.53E-04
	Emission in each Box of 2nd jet	g/s	2.64E-04	2.07E-04	1.45E-04	1.11E-04	9.39E-05	1.39E-04	3.06E-04	7.62E-04	1.68E-03	1.54E-03	1.27E-03	1.16E-03	9.25E-04	8.37E-04	9.14E-04	1.00E-03	1.07E-03	1.22E-03	1.37E-03	1.24E-03	8.31E-04	5.95E-04	5.38E-04	4.61E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 104A01-104A08
Enclosure Involvec: 104P1
Road Located: 104
Vehicle EF Adopte: 104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1173	0.0962	0.0973	0.1012	0.1039	0.1962	0.2078	0.1591	0.1930	0.1833	0.1685	0.1645	0.1324	0.1269	0.1320	0.1357	0.1375	0.1432	0.1503	0.1438	0.1227	0.1153	0.1131	0.1098
	NO2	g/vehicle/km	0.0199	0.0186	0.0187	0.0191	0.0193	0.0243	0.0247	0.0236	0.0354	0.0334	0.0304	0.0293	0.0267	0.0253	0.0266	0.0275	0.0278	0.0293	0.0312	0.0297	0.0246	0.0220	0.0214	0.0209
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0135***	***0.0090***	***0.0063***	***0.0048***	***0.0041***	***0.0092***	***0.0207***	***0.0401***	***0.0735***	***0.0677***	***0.0572***	***0.0534***	***0.0382***	***0.0342***	***0.0378***	***0.0408***	***0.0431***	***0.0484***	***0.0537***	***0.0494***	***0.0344***	***0.0264***	***0.0242***	***0.0209***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.01E-03	6.02E-03	4.19E-03	3.22E-03	2.76E-03	6.12E-03	1.38E-02	2.68E-02	4.90E-02	4.51E-02	3.81E-02	3.56E-02	2.54E-02	2.28E-02	2.52E-02	2.72E-02	2.87E-02	3.22E-02	3.58E-02	3.29E-02	2.30E-02	1.76E-02	1.62E-02	1.39E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.51E-03	3.01E-03	2.10E-03	1.61E-03	1.38E-03	3.06E-03	6.89E-03	1.34E-02	2.45E-02	2.26E-02	1.91E-02	1.78E-02	1.27E-02	1.14E-02	1.26E-02	1.36E-02	1.44E-02	1.61E-02	1.79E-02	1.65E-02	1.15E-02	8.79E-03	8.08E-03	6.96E-03
	Emission in each Box of 1st jet	g/s	1.80E-03	1.20E-03	8.38E-04	6.44E-04	5.53E-04	1.22E-03	2.75E-03	5.35E-03	9.79E-03	9.03E-03	7.63E-03	7.12E-03	5.09E-03	4.56E-03	5.04E-03	5.44E-03	5.74E-03	6.45E-03	7.16E-03	6.59E-03	4.59E-03	3.52E-03	3.23E-03	2.78E-03
	Emission in each Box of 2nd jet	g/s	1.50E-03	1.00E-03	6.98E-04	5.36E-04	4.61E-04	1.02E-03	2.30E-03	4.46E-03	8.16E-03	7.52E-03	6.36E-03	5.94E-03	4.24E-03	3.80E-03	4.20E-03	4.53E-03	4.79E-03	5.37E-03	5.97E-03	5.49E-03	3.83E-03	2.93E-03	2.69E-03	2.32E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0017***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0025***	***0.0060***	***0.0135***	***0.0124***	***0.0103***	***0.0095***	***0.0077***	***0.0068***	***0.0076***	***0.0083***	***0.0087***	***0.0099***	***0.0112***	***0.0102***	***0.0069***	***0.0050***	***0.0046***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.53E-03	1.16E-03	8.06E-04	6.08E-04	5.15E-04	7.56E-04	1.64E-03	3.97E-03	8.97E-03	8.23E-03	6.88E-03	6.34E-03	5.12E-03	4.53E-03	5.07E-03	5.50E-03	5.81E-03	6.59E-03	7.44E-03	6.81E-03	4.60E-03	3.36E-03	3.06E-03	2.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.63E-04	5.82E-04	4.03E-04	3.04E-04	2.57E-04	3.78E-04	8.19E-04	1.99E-03	4.48E-03	4.12E-03	3.44E-03	3.17E-03	2.56E-03	2.27E-03	2.53E-03	2.75E-03	2.91E-03	3.30E-03	3.72E-03	3.41E-03	2.30E-03	1.68E-03	1.53E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	3.05E-04	2.33E-04	1.61E-04	1.22E-04	1.03E-04	1.51E-04	3.28E-04	7.94E-04	1.79E-03	1.65E-03	1.38E-03	1.27E-03	1.02E-03	9.07E-04	1.01E-03	1.10E-03	1.16E-03	1.32E-03	1.49E-03	1.36E-03	9.20E-04	6.72E-04	6.13E-04	5.30E-04
	Emission in each Box of 2nd jet	g/s	2.54E-04	1.94E-04	1.34E-04	1.01E-04	8.58E-05	1.26E-04	2.73E-04	6.62E-04	1.49E-03	1.37E-03	1.15E-03	1.06E-03	8.54E-04	7.56E-04	8.45E-04	9.17E-04	9.69E-04	1.10E-03	1.24E-03	1.14E-03	7.66E-04	5.60E-04	5.11E-04	4.41E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section 104A01-104A08
Enclosure Involvec 104P1
Road Located 104
Vehicle EF Adopte 104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1065	0.0908	0.0946	0.0976	0.0998	0.1872	0.1981	0.1567	0.1924	0.1805	0.1654	0.1585	0.1276	0.1272	0.1306	0.1354	0.1365	0.1451	0.1561	0.1461	0.1243	0.1155	0.1120	0.1113
	NO2	g/vehicle/km	0.0183	0.0177	0.0183	0.0185	0.0187	0.0233	0.0237	0.0232	0.0352	0.0330	0.0299	0.0282	0.0258	0.0253	0.0263	0.0274	0.0277	0.0297	0.0323	0.0302	0.0249	0.0221	0.0212	0.0212
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0123***	***0.0085***	***0.0061***	***0.0047***	***0.0040***	***0.0088***	***0.0197***	***0.0395***	***0.0732***	***0.0667***	***0.0562***	***0.0515***	***0.0368***	***0.0343***	***0.0374***	***0.0407***	***0.0428***	***0.0490***	***0.0558***	***0.0502***	***0.0349***	***0.0264***	***0.0240***	***0.0212***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.18E-03	5.69E-03	4.07E-03	3.10E-03	2.65E-03	5.84E-03	1.31E-02	2.63E-02	4.88E-02	4.44E-02	3.74E-02	3.43E-02	2.45E-02	2.28E-02	2.49E-02	2.71E-02	2.85E-02	3.27E-02	3.72E-02	3.35E-02	2.33E-02	1.76E-02	1.60E-02	1.41E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.09E-03	2.84E-03	2.04E-03	1.55E-03	1.33E-03	2.92E-03	6.57E-03	1.32E-02	2.44E-02	2.22E-02	1.87E-02	1.72E-02	1.23E-02	1.14E-02	1.25E-02	1.36E-02	1.43E-02	1.63E-02	1.86E-02	1.67E-02	1.16E-02	8.81E-03	8.01E-03	7.05E-03
	Emission in each Box of 1st jet	g/s	1.64E-03	1.14E-03	8.15E-04	6.20E-04	5.31E-04	1.17E-03	2.63E-03	5.27E-03	9.76E-03	8.89E-03	7.49E-03	6.87E-03	4.90E-03	4.57E-03	4.98E-03	5.43E-03	5.70E-03	6.54E-03	7.44E-03	6.69E-03	4.65E-03	3.52E-03	3.20E-03	2.82E-03
	Emission in each Box of 2nd jet	g/s	1.36E-03	9.48E-04	6.79E-04	5.17E-04	4.42E-04	9.73E-04	2.19E-03	4.39E-03	8.14E-03	7.41E-03	6.24E-03	5.72E-03	4.09E-03	3.81E-03	4.15E-03	4.52E-03	4.75E-03	5.45E-03	6.20E-03	5.58E-03	3.88E-03	2.94E-03	2.67E-03	2.35E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0017***	***0.0012***	***0.0009***	***0.0007***	***0.0011***	***0.0024***	***0.0059***	***0.0134***	***0.0122***	***0.0101***	***0.0092***	***0.0074***	***0.0068***	***0.0075***	***0.0082***	***0.0087***	***0.0100***	***0.0115***	***0.0104***	***0.0070***	***0.0051***	***0.0046***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.40E-03	1.11E-03	7.86E-04	5.89E-04	4.97E-04	7.25E-04	1.57E-03	3.91E-03	8.92E-03	8.12E-03	6.76E-03	6.12E-03	4.96E-03	4.54E-03	5.03E-03	5.50E-03	5.78E-03	6.69E-03	7.69E-03	6.92E-03	4.65E-03	3.37E-03	3.04E-03	2.68E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.01E-04	5.54E-04	3.93E-04	2.95E-04	2.48E-04	3.62E-04	7.84E-04	1.95E-03	4.46E-03	4.06E-03	3.38E-03	3.06E-03	2.48E-03	2.27E-03	2.51E-03	2.75E-03	2.89E-03	3.34E-03	3.85E-03	3.46E-03	2.33E-03	1.68E-03	1.52E-03	1.34E-03
	Emission in each Box of 1st jet	g/s	2.81E-04	2.22E-04	1.57E-04	1.18E-04	9.93E-05	1.45E-04	3.14E-04	7.81E-04	1.78E-03	1.62E-03	1.35E-03	1.22E-03	9.91E-04	9.09E-04	1.01E-03	1.10E-03	1.16E-03	1.34E-03	1.54E-03	1.38E-03	9.30E-04	6.74E-04	6.07E-04	5.36E-04
	Emission in each Box of 2nd jet	g/s	2.34E-04	1.85E-04	1.31E-04	9.82E-05	8.28E-05	1.21E-04	2.61E-04	6.51E-04	1.49E-03	1.35E-03	1.13E-03	1.02E-03	8.26E-04	7.57E-04	8.38E-04	9.16E-04	9.63E-04	1.11E-03	1.28E-03	1.15E-03	7.75E-04	5.62E-04	5.06E-04	4.47E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 104A01-104A08
Enclosure Involvec: 104P1
Road Located: 104
Vehicle EF Adopte: 104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1042	0.0876	0.0906	0.0933	0.0940	0.1824	0.1902	0.1494	0.1821	0.1806	0.1681	0.1664	0.1324	0.1293	0.1333	0.1392	0.1353	0.1432	0.1509	0.1403	0.1161	0.1079	0.1048	0.1010
	NO2	g/vehicle/km	0.0178	0.0171	0.0175	0.0178	0.0176	0.0226	0.0227	0.0223	0.0334	0.0330	0.0303	0.0296	0.0267	0.0257	0.0268	0.0282	0.0274	0.0293	0.0313	0.0291	0.0233	0.0208	0.0200	0.0194
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0120***	***0.0082***	***0.0059***	***0.0044***	***0.0037***	***0.0085***	***0.0189***	***0.0377***	***0.0693***	***0.0667***	***0.0571***	***0.0541***	***0.0382***	***0.0348***	***0.0381***	***0.0418***	***0.0424***	***0.0484***	***0.0540***	***0.0482***	***0.0326***	***0.0247***	***0.0225***	***0.0192***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.00E-03	5.48E-03	3.90E-03	2.97E-03	2.50E-03	5.69E-03	1.26E-02	2.51E-02	4.62E-02	4.45E-02	3.81E-02	3.60E-02	2.54E-02	2.32E-02	2.54E-02	2.79E-02	2.82E-02	3.22E-02	3.60E-02	3.21E-02	2.17E-02	1.64E-02	1.50E-02	1.28E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.00E-03	2.74E-03	1.95E-03	1.48E-03	1.25E-03	2.84E-03	6.30E-03	1.26E-02	2.31E-02	2.22E-02	1.90E-02	1.80E-02	1.27E-02	1.16E-02	1.27E-02	1.39E-02	1.41E-02	1.61E-02	1.80E-02	1.61E-02	1.09E-02	8.22E-03	7.49E-03	6.40E-03
	Emission in each Box of 1st jet	g/s	1.60E-03	1.10E-03	7.80E-04	5.93E-04	5.00E-04	1.14E-03	2.52E-03	5.02E-03	9.24E-03	8.90E-03	7.61E-03	7.21E-03	5.09E-03	4.64E-03	5.09E-03	5.58E-03	5.65E-03	6.45E-03	7.20E-03	6.43E-03	4.34E-03	3.29E-03	3.00E-03	2.56E-03
	Emission in each Box of 2nd jet	g/s	1.33E-03	9.14E-04	6.50E-04	4.94E-04	4.17E-04	9.48E-04	2.10E-03	4.19E-03	7.70E-03	7.41E-03	6.34E-03	6.01E-03	4.24E-03	3.87E-03	4.24E-03	4.65E-03	4.71E-03	5.37E-03	6.00E-03	5.35E-03	3.62E-03	2.74E-03	2.50E-03	2.13E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0023***	***0.0056***	***0.0127***	***0.0122***	***0.0103***	***0.0096***	***0.0077***	***0.0069***	***0.0077***	***0.0085***	***0.0086***	***0.0099***	***0.0112***	***0.0100***	***0.0065***	***0.0048***	***0.0043***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.37E-03	1.07E-03	7.54E-04	5.65E-04	4.69E-04	7.05E-04	1.51E-03	3.74E-03	8.49E-03	8.12E-03	6.86E-03	6.41E-03	5.12E-03	4.61E-03	5.12E-03	5.65E-03	5.73E-03	6.59E-03	7.46E-03	6.66E-03	4.36E-03	3.17E-03	2.86E-03	2.46E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.84E-04	5.35E-04	3.77E-04	2.82E-04	2.35E-04	3.53E-04	7.53E-04	1.87E-03	4.24E-03	4.06E-03	3.43E-03	3.20E-03	2.56E-03	2.31E-03	2.56E-03	2.83E-03	2.86E-03	3.30E-03	3.73E-03	3.33E-03	2.18E-03	1.58E-03	1.43E-03	1.23E-03
	Emission in each Box of 1st jet	g/s	2.74E-04	2.14E-04	1.51E-04	1.13E-04	9.39E-05	1.41E-04	3.01E-04	7.48E-04	1.70E-03	1.62E-03	1.37E-03	1.28E-03	1.02E-03	9.23E-04	1.02E-03	1.13E-03	1.15E-03	1.32E-03	1.49E-03	1.33E-03	8.72E-04	6.34E-04	5.72E-04	4.92E-04
	Emission in each Box of 2nd jet	g/s	2.28E-04	1.78E-04	1.26E-04	9.41E-05	7.82E-05	1.18E-04	2.51E-04	6.23E-04	1.41E-03	1.35E-03	1.14E-03	1.07E-03	8.54E-04	7.69E-04	8.53E-04	9.42E-04	9.55E-04	1.10E-03	1.24E-03	1.11E-03	7.26E-04	5.28E-04	4.77E-04	4.10E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section 104A01-104A08
Enclosure Involvec 104P1
Road Located 104
Vehicle EF Adopte 104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1103	0.0900	0.0938	0.0984	0.0998	0.1864	0.1973	0.1487	0.1839	0.1769	0.1643	0.1591	0.1287	0.1290	0.1335	0.1373	0.1446	0.1501	0.1596	0.1485	0.1217	0.1095	0.1088	0.1065
	NO2	g/vehicle/km	0.0188	0.0176	0.0181	0.0187	0.0187	0.0232	0.0236	0.0221	0.0337	0.0324	0.0297	0.0284	0.0260	0.0257	0.0269	0.0278	0.0292	0.0306	0.0329	0.0307	0.0244	0.0211	0.0207	0.0203
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0127***	***0.0085***	***0.0061***	***0.0047***	***0.0040***	***0.0087***	***0.0196***	***0.0375***	***0.0700***	***0.0654***	***0.0558***	***0.0517***	***0.0371***	***0.0348***	***0.0382***	***0.0413***	***0.0453***	***0.0507***	***0.0571***	***0.0510***	***0.0342***	***0.0251***	***0.0233***	***0.0202***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.47E-03	5.64E-03	4.04E-03	3.13E-03	2.65E-03	5.81E-03	1.31E-02	2.50E-02	4.67E-02	4.36E-02	3.72E-02	3.45E-02	2.47E-02	2.32E-02	2.55E-02	2.75E-02	3.02E-02	3.38E-02	3.80E-02	3.40E-02	2.28E-02	1.67E-02	1.56E-02	1.35E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.23E-03	2.82E-03	2.02E-03	1.56E-03	1.33E-03	2.91E-03	6.54E-03	1.25E-02	2.33E-02	2.18E-02	1.86E-02	1.72E-02	1.24E-02	1.16E-02	1.27E-02	1.38E-02	1.51E-02	1.69E-02	1.90E-02	1.70E-02	1.14E-02	8.35E-03	7.78E-03	6.75E-03
	Emission in each Box of 1st jet	g/s	1.69E-03	1.13E-03	8.08E-04	6.26E-04	5.31E-04	1.16E-03	2.62E-03	5.00E-03	9.33E-03	8.72E-03	7.44E-03	6.89E-03	4.95E-03	4.63E-03	5.09E-03	5.50E-03	6.04E-03	6.76E-03	7.61E-03	6.80E-03	4.56E-03	3.34E-03	3.11E-03	2.70E-03
	Emission in each Box of 2nd jet	g/s	1.41E-03	9.39E-04	6.73E-04	5.22E-04	4.42E-04	9.68E-04	2.18E-03	4.17E-03	7.78E-03	7.26E-03	6.20E-03	5.75E-03	4.12E-03	3.86E-03	4.24E-03	4.59E-03	5.03E-03	5.63E-03	6.34E-03	5.67E-03	3.80E-03	2.78E-03	2.59E-03	2.25E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0016***	***0.0012***	***0.0009***	***0.0007***	***0.0011***	***0.0023***	***0.0056***	***0.0128***	***0.0120***	***0.0101***	***0.0092***	***0.0075***	***0.0069***	***0.0077***	***0.0084***	***0.0091***	***0.0103***	***0.0118***	***0.0105***	***0.0069***	***0.0048***	***0.0044***	***0.0039***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.45E-03	1.10E-03	7.81E-04	5.94E-04	4.97E-04	7.22E-04	1.56E-03	3.72E-03	8.56E-03	7.97E-03	6.72E-03	6.15E-03	4.99E-03	4.61E-03	5.12E-03	5.57E-03	6.10E-03	6.90E-03	7.85E-03	7.03E-03	4.57E-03	3.21E-03	2.96E-03	2.58E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.23E-04	5.50E-04	3.90E-04	2.97E-04	2.48E-04	3.61E-04	7.81E-04	1.86E-03	4.28E-03	3.99E-03	3.36E-03	3.08E-03	2.50E-03	2.30E-03	2.56E-03	2.78E-03	3.05E-03	3.45E-03	3.93E-03	3.51E-03	2.28E-03	1.61E-03	1.48E-03	1.29E-03
	Emission in each Box of 1st jet	g/s	2.89E-04	2.20E-04	1.56E-04	1.19E-04	9.93E-05	1.44E-04	3.12E-04	7.44E-04	1.71E-03	1.59E-03	1.34E-03	1.23E-03	9.99E-04	9.22E-04	1.02E-03	1.11E-03	1.22E-03	1.38E-03	1.57E-03	1.41E-03	9.13E-04	6.43E-04	5.92E-04	5.15E-04
	Emission in each Box of 2nd jet	g/s	2.41E-04	1.83E-04	1.30E-04	9.90E-05	8.28E-05	1.20E-04	2.60E-04	6.20E-04	1.43E-03	1.33E-03	1.12E-03	1.03E-03	8.32E-04	7.68E-04	8.54E-04	9.28E-04	1.02E-03	1.15E-03	1.31E-03	1.17E-03	7.61E-04	5.36E-04	4.94E-04	4.29E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 104A01-104A08
Enclosure Involvec: 104P1
Road Located: 104
Vehicle EF Adopte: 104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1095	0.0922	0.0925	0.0943	0.0992	0.1815	0.1930	0.1462	0.1759	0.1690	0.1629	0.1519	0.1266	0.1254	0.1325	0.1301	0.1299	0.1420	0.1523	0.1417	0.1216	0.1106	0.1086	0.1053
	NO2	g/vehicle/km	0.0187	0.0179	0.0179	0.0179	0.0186	0.0225	0.0230	0.0218	0.0324	0.0310	0.0294	0.0271	0.0256	0.0250	0.0267	0.0264	0.0264	0.0291	0.0315	0.0293	0.0244	0.0213	0.0207	0.0201
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0126***	***0.0087***	***0.0060***	***0.0045***	***0.0040***	***0.0085***	***0.0192***	***0.0369***	***0.0670***	***0.0624***	***0.0553***	***0.0494***	***0.0365***	***0.0338***	***0.0379***	***0.0391***	***0.0407***	***0.0479***	***0.0544***	***0.0487***	***0.0341***	***0.0253***	***0.0233***	***0.0200***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.41E-03	5.77E-03	3.98E-03	3.00E-03	2.64E-03	5.66E-03	1.28E-02	2.46E-02	4.46E-02	4.16E-02	3.69E-02	3.29E-02	2.43E-02	2.25E-02	2.53E-02	2.61E-02	2.71E-02	3.20E-02	3.63E-02	3.25E-02	2.28E-02	1.69E-02	1.55E-02	1.33E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.20E-03	2.89E-03	1.99E-03	1.50E-03	1.32E-03	2.83E-03	6.40E-03	1.23E-02	2.23E-02	2.08E-02	1.84E-02	1.65E-02	1.22E-02	1.13E-02	1.26E-02	1.30E-02	1.36E-02	1.60E-02	1.81E-02	1.62E-02	1.14E-02	8.43E-03	7.76E-03	6.67E-03
	Emission in each Box of 1st jet	g/s	1.68E-03	1.15E-03	7.96E-04	5.99E-04	5.28E-04	1.13E-03	2.56E-03	4.91E-03	8.93E-03	8.32E-03	7.37E-03	6.58E-03	4.86E-03	4.50E-03	5.06E-03	5.22E-03	5.42E-03	6.39E-03	7.26E-03	6.49E-03	4.55E-03	3.37E-03	3.10E-03	2.67E-03
	Emission in each Box of 2nd jet	g/s	1.40E-03	9.62E-04	6.64E-04	5.00E-04	4.40E-04	9.43E-04	2.13E-03	4.10E-03	7.44E-03	6.94E-03	6.14E-03	5.49E-03	4.05E-03	3.75E-03	4.21E-03	4.35E-03	4.52E-03	5.33E-03	6.05E-03	5.41E-03	3.79E-03	2.81E-03	2.59E-03	2.22E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0007***	***0.0011***	***0.0023***	***0.0055***	***0.0123***	***0.0115***	***0.0100***	***0.0088***	***0.0074***	***0.0067***	***0.0076***	***0.0079***	***0.0083***	***0.0098***	***0.0113***	***0.0101***	***0.0068***	***0.0049***	***0.0044***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.44E-03	1.12E-03	7.71E-04	5.69E-04	4.94E-04	7.03E-04	1.53E-03	3.66E-03	8.22E-03	7.64E-03	6.67E-03	5.88E-03	4.91E-03	4.48E-03	5.09E-03	5.30E-03	5.51E-03	6.54E-03	7.52E-03	6.72E-03	4.56E-03	3.24E-03	2.95E-03	2.55E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.18E-04	5.61E-04	3.85E-04	2.85E-04	2.47E-04	3.51E-04	7.64E-04	1.83E-03	4.11E-03	3.82E-03	3.33E-03	2.94E-03	2.46E-03	2.24E-03	2.54E-03	2.65E-03	2.76E-03	3.27E-03	3.76E-03	3.36E-03	2.28E-03	1.62E-03	1.48E-03	1.28E-03
	Emission in each Box of 1st jet	g/s	2.87E-04	2.24E-04	1.54E-04	1.14E-04	9.88E-05	1.41E-04	3.05E-04	7.33E-04	1.64E-03	1.53E-03	1.33E-03	1.18E-03	9.82E-04	8.97E-04	1.02E-03	1.06E-03	1.10E-03	1.31E-03	1.50E-03	1.34E-03	9.12E-04	6.48E-04	5.91E-04	5.10E-04
	Emission in each Box of 2nd jet	g/s	2.39E-04	1.87E-04	1.28E-04	9.49E-05	8.23E-05	1.17E-04	2.55E-04	6.11E-04	1.37E-03	1.27E-03	1.11E-03	9.80E-04	8.19E-04	7.47E-04	8.48E-04	8.83E-04	9.19E-04	1.09E-03	1.25E-03	1.12E-03	7.60E-04	5.40E-04	4.92E-04	4.25E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1254	0.1072	0.1081	0.1121	0.1156	0.2198	0.2312	0.1757	0.2107	0.1999	0.1827	0.1787	0.1452	0.1406	0.1432	0.1504	0.1505	0.1600	0.1716	0.1609	0.1375	0.1251	0.1240	0.1225
	NO2	g/vehicle/km	0.0211	0.0204	0.0205	0.0209	0.0212	0.0269	0.0273	0.0258	0.0382	0.0362	0.0327	0.0315	0.0290	0.0277	0.0286	0.0302	0.0302	0.0324	0.0351	0.0330	0.0272	0.0237	0.0232	0.0230
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0144***	***0.0101***	***0.0070***	***0.0053***	***0.0046***	***0.0103***	***0.0230***	***0.0443***	***0.0802***	***0.0738***	***0.0621***	***0.0581***	***0.0418***	***0.0379***	***0.0410***	***0.0452***	***0.0471***	***0.0540***	***0.0614***	***0.0553***	***0.0386***	***0.0286***	***0.0266***	***0.0233***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.63E-03	6.71E-03	4.66E-03	3.56E-03	3.08E-03	6.85E-03	1.53E-02	2.95E-02	5.34E-02	4.92E-02	4.14E-02	3.87E-02	2.79E-02	2.52E-02	2.73E-02	3.01E-02	3.14E-02	3.60E-02	4.09E-02	3.69E-02	2.57E-02	1.91E-02	1.77E-02	1.55E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.81E-03	3.36E-03	2.33E-03	1.78E-03	1.54E-03	3.43E-03	7.66E-03	1.48E-02	2.67E-02	2.46E-02	2.07E-02	1.94E-02	1.39E-02	1.26E-02	1.37E-02	1.51E-02	1.57E-02	1.80E-02	2.05E-02	1.84E-02	1.29E-02	9.53E-03	8.86E-03	7.76E-03
	Emission in each Box of 1st jet	g/s	1.93E-03	1.34E-03	9.31E-04	7.13E-04	6.15E-04	1.37E-03	3.07E-03	5.91E-03	1.07E-02	9.84E-03	8.27E-03	7.74E-03	5.58E-03	5.05E-03	5.47E-03	6.03E-03	6.28E-03	7.20E-03	8.18E-03	7.37E-03	5.14E-03	3.81E-03	3.55E-03	3.10E-03
	Emission in each Box of 2nd jet	g/s	1.60E-03	1.12E-03	7.76E-04	5.94E-04	5.13E-04	1.14E-03	2.55E-03	4.92E-03	8.91E-03	8.20E-03	6.89E-03	6.45E-03	4.65E-03	4.21E-03	4.55E-03	5.02E-03	5.24E-03	6.00E-03	6.82E-03	6.14E-03	4.29E-03	3.18E-03	2.95E-03	2.59E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0013***	***0.0027***	***0.0065***	***0.0145***	***0.0134***	***0.0111***	***0.0102***	***0.0083***	***0.0075***	***0.0082***	***0.0091***	***0.0095***	***0.0110***	***0.0126***	***0.0113***	***0.0076***	***0.0054***	***0.0050***	***0.0044***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.62E-03	1.28E-03	8.82E-04	6.64E-04	5.63E-04	8.38E-04	1.81E-03	4.34E-03	9.68E-03	8.91E-03	7.40E-03	6.83E-03	5.57E-03	4.98E-03	5.46E-03	6.04E-03	6.31E-03	7.30E-03	8.37E-03	7.55E-03	5.09E-03	3.62E-03	3.32E-03	2.92E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.10E-04	6.38E-04	4.41E-04	3.32E-04	2.81E-04	4.19E-04	9.03E-04	2.17E-03	4.84E-03	4.46E-03	3.70E-03	3.42E-03	2.78E-03	2.49E-03	2.73E-03	3.02E-03	3.15E-03	3.65E-03	4.18E-03	3.78E-03	2.54E-03	1.81E-03	1.66E-03	1.46E-03
	Emission in each Box of 1st jet	g/s	3.24E-04	2.55E-04	1.76E-04	1.33E-04	1.13E-04	1.68E-04	3.61E-04	8.68E-04	1.94E-03	1.78E-03	1.48E-03	1.37E-03	1.11E-03	9.95E-04	1.09E-03	1.21E-03	1.26E-03	1.46E-03	1.67E-03	1.51E-03	1.02E-03	7.24E-04	6.65E-04	5.84E-04
	Emission in each Box of 2nd jet	g/s	2.70E-04	2.13E-04	1.47E-04	1.11E-04	9.38E-05	1.40E-04	3.01E-04	7.23E-04	1.61E-03	1.49E-03	1.23E-03	1.14E-03	9.28E-04	8.29E-04	9.10E-04	1.01E-03	1.05E-03	1.22E-03	1.39E-03	1.26E-03	8.48E-04	6.03E-04	5.54E-04	4.86E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1378	0.1155	0.1185	0.1235	0.1269	0.2384	0.2534	0.1906	0.2287	0.2162	0.1985	0.1913	0.1564	0.1530	0.1564	0.1614	0.1621	0.1712	0.1834	0.1752	0.1478	0.1373	0.1352	0.1330
	NO2	g/vehicle/km	0.0229	0.0218	0.0221	0.0226	0.0229	0.0290	0.0297	0.0278	0.0410	0.0388	0.0351	0.0334	0.0308	0.0298	0.0309	0.0321	0.0322	0.0344	0.0372	0.0355	0.0290	0.0257	0.0251	0.0247
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0159***	***0.0108***	***0.0077***	***0.0059***	***0.0051***	***0.0111***	***0.0252***	***0.0480***	***0.0870***	***0.0799***	***0.0674***	***0.0621***	***0.0451***	***0.0412***	***0.0448***	***0.0485***	***0.0508***	***0.0578***	***0.0656***	***0.0602***	***0.0415***	***0.0314***	***0.0290***	***0.0253***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.06E-02	7.23E-03	5.10E-03	3.92E-03	3.38E-03	7.43E-03	1.68E-02	3.20E-02	5.80E-02	5.33E-02	4.49E-02	4.14E-02	3.00E-02	2.75E-02	2.98E-02	3.23E-02	3.38E-02	3.85E-02	4.37E-02	4.01E-02	2.77E-02	2.09E-02	1.93E-02	1.68E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.29E-03	3.61E-03	2.55E-03	1.96E-03	1.69E-03	3.71E-03	8.40E-03	1.60E-02	2.90E-02	2.66E-02	2.25E-02	2.07E-02	1.50E-02	1.37E-02	1.49E-02	1.62E-02	1.69E-02	1.93E-02	2.19E-02	2.01E-02	1.38E-02	1.05E-02	9.67E-03	8.42E-03
	Emission in each Box of 1st jet	g/s	2.12E-03	1.45E-03	1.02E-03	7.85E-04	6.75E-04	1.49E-03	3.36E-03	6.41E-03	1.16E-02	1.07E-02	8.99E-03	8.29E-03	6.01E-03	5.49E-03	5.97E-03	6.47E-03	6.77E-03	7.71E-03	8.74E-03	8.03E-03	5.53E-03	4.19E-03	3.87E-03	3.37E-03
	Emission in each Box of 2nd jet	g/s	1.76E-03	1.20E-03	8.50E-04	6.54E-04	5.63E-04	1.24E-03	2.80E-03	5.34E-03	9.67E-03	8.88E-03	7.49E-03	6.90E-03	5.01E-03	4.58E-03	4.97E-03	5.39E-03	5.64E-03	6.42E-03	7.29E-03	6.69E-03	4.61E-03	3.49E-03	3.22E-03	2.81E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0011***	***0.0009***	***0.0014***	***0.0029***	***0.0070***	***0.0156***	***0.0143***	***0.0119***	***0.0109***	***0.0089***	***0.0080***	***0.0088***	***0.0096***	***0.0101***	***0.0116***	***0.0133***	***0.0122***	***0.0081***	***0.0059***	***0.0054***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.76E-03	1.36E-03	9.52E-04	7.20E-04	6.10E-04	9.03E-04	1.97E-03	4.67E-03	1.04E-02	9.55E-03	7.95E-03	7.24E-03	5.92E-03	5.35E-03	5.90E-03	6.43E-03	6.73E-03	7.75E-03	8.88E-03	8.14E-03	5.42E-03	3.92E-03	3.59E-03	3.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.79E-04	6.81E-04	4.76E-04	3.60E-04	3.05E-04	4.51E-04	9.83E-04	2.34E-03	5.20E-03	4.77E-03	3.97E-03	3.62E-03	2.96E-03	2.67E-03	2.95E-03	3.21E-03	3.36E-03	3.87E-03	4.44E-03	4.07E-03	2.71E-03	1.96E-03	1.79E-03	1.57E-03
	Emission in each Box of 1st jet	g/s	3.52E-04	2.73E-04	1.90E-04	1.44E-04	1.22E-04	1.81E-04	3.93E-04	9.35E-04	2.08E-03	1.91E-03	1.59E-03	1.45E-03	1.18E-03	1.07E-03	1.18E-03	1.29E-03	1.35E-03	1.55E-03	1.78E-03	1.63E-03	1.08E-03	7.85E-04	7.18E-04	6.27E-04
	Emission in each Box of 2nd jet	g/s	2.93E-04	2.27E-04	1.59E-04	1.20E-04	1.02E-04	1.50E-04	3.28E-04	7.79E-04	1.73E-03	1.59E-03	1.32E-03	1.21E-03	9.87E-04	8.91E-04	9.83E-04	1.07E-03	1.12E-03	1.29E-03	1.48E-03	1.36E-03	9.04E-04	6.54E-04	5.98E-04	5.22E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1439	0.1215	0.1246	0.1301	0.1330	0.2464	0.2620	0.1985	0.2364	0.2233	0.2051	0.1990	0.1620	0.1574	0.1611	0.1667	0.1685	0.1799	0.1903	0.1817	0.1537	0.1426	0.1409	0.1390
	NO2	g/vehicle/km	0.0237	0.0225	0.0229	0.0235	0.0237	0.0297	0.0304	0.0287	0.0421	0.0397	0.0359	0.0344	0.0316	0.0304	0.0316	0.0328	0.0332	0.0357	0.0383	0.0365	0.0298	0.0265	0.0258	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0166***	***0.0114***	***0.0080***	***0.0062***	***0.0053***	***0.0115***	***0.0260***	***0.0501***	***0.0900***	***0.0825***	***0.0696***	***0.0647***	***0.0467***	***0.0424***	***0.0461***	***0.0501***	***0.0528***	***0.0607***	***0.0681***	***0.0624***	***0.0431***	***0.0326***	***0.0302***	***0.0264***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.11E-02	7.61E-03	5.37E-03	4.13E-03	3.54E-03	7.68E-03	1.74E-02	3.34E-02	6.00E-02	5.50E-02	4.64E-02	4.31E-02	3.11E-02	2.83E-02	3.07E-02	3.34E-02	3.52E-02	4.05E-02	4.54E-02	4.16E-02	2.88E-02	2.17E-02	2.01E-02	1.76E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.53E-03	3.80E-03	2.68E-03	2.07E-03	1.77E-03	3.84E-03	8.68E-03	1.67E-02	3.00E-02	2.75E-02	2.32E-02	2.16E-02	1.56E-02	1.41E-02	1.54E-02	1.67E-02	1.76E-02	2.02E-02	2.27E-02	2.08E-02	1.44E-02	1.09E-02	1.01E-02	8.81E-03
	Emission in each Box of 1st jet	g/s	2.21E-03	1.52E-03	1.07E-03	8.27E-04	7.08E-04	1.54E-03	3.47E-03	6.67E-03	1.20E-02	1.10E-02	9.29E-03	8.62E-03	6.23E-03	5.65E-03	6.15E-03	6.68E-03	7.04E-03	8.10E-03	9.07E-03	8.32E-03	5.75E-03	4.35E-03	4.03E-03	3.52E-03
	Emission in each Box of 2nd jet	g/s	1.84E-03	1.27E-03	8.94E-04	6.89E-04	5.90E-04	1.28E-03	2.89E-03	5.56E-03	1.00E-02	9.17E-03	7.74E-03	7.18E-03	5.19E-03	4.71E-03	5.12E-03	5.57E-03	5.86E-03	6.75E-03	7.56E-03	6.93E-03	4.79E-03	3.62E-03	3.36E-03	2.94E-03
NO_2 Emission Rate		g/s	***0.0027***	***0.0021***	***0.0015***	***0.0011***	***0.0009***	***0.0014***	***0.0030***	***0.0072***	***0.0160***	***0.0147***	***0.0122***	***0.0112***	***0.0091***	***0.0082***	***0.0090***	***0.0099***	***0.0104***	***0.0121***	***0.0137***	***0.0125***	***0.0084***	***0.0061***	***0.0055***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.82E-03	1.41E-03	9.86E-04	7.46E-04	6.30E-04	9.27E-04	2.02E-03	4.82E-03	1.07E-02	9.77E-03	8.13E-03	7.46E-03	6.08E-03	5.46E-03	6.03E-03	6.58E-03	6.93E-03	8.05E-03	9.12E-03	8.35E-03	5.58E-03	4.04E-03	3.69E-03	3.24E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.09E-04	7.05E-04	4.93E-04	3.73E-04	3.15E-04	4.64E-04	1.01E-03	2.41E-03	5.34E-03	4.89E-03	4.07E-03	3.73E-03	3.04E-03	2.73E-03	3.01E-03	3.29E-03	3.47E-03	4.02E-03	4.56E-03	4.18E-03	2.79E-03	2.02E-03	1.85E-03	1.62E-03
	Emission in each Box of 1st jet	g/s	3.63E-04	2.82E-04	1.97E-04	1.49E-04	1.26E-04	1.85E-04	4.03E-04	9.63E-04	2.13E-03	1.95E-03	1.63E-03	1.49E-03	1.22E-03	1.09E-03	1.21E-03	1.32E-03	1.39E-03	1.61E-03	1.82E-03	1.67E-03	1.12E-03	8.07E-04	7.39E-04	6.48E-04
	Emission in each Box of 2nd jet	g/s	3.03E-04	2.35E-04	1.64E-04	1.24E-04	1.05E-04	1.55E-04	3.36E-04	8.03E-04	1.78E-03	1.63E-03	1.36E-03	1.24E-03	1.01E-03	9.10E-04	1.00E-03	1.10E-03	1.16E-03	1.34E-03	1.52E-03	1.39E-03	9.29E-04	6.73E-04	6.16E-04	5.40E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1458	0.1243	0.1268	0.1327	0.1354	0.2499	0.2648	0.2020	0.2395	0.2261	0.2066	0.2019	0.1638	0.1602	0.1641	0.1698	0.1736	0.1843	0.1952	0.1856	0.1577	0.1462	0.1428	0.1399
	NO2	g/vehicle/km	0.0238	0.0228	0.0231	0.0237	0.0239	0.0300	0.0307	0.0290	0.0424	0.0401	0.0361	0.0348	0.0319	0.0307	0.0320	0.0332	0.0339	0.0364	0.0390	0.0370	0.0303	0.0270	0.0261	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0022***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0016***	***0.0036***	***0.0067***	***0.0118***	***0.0108***	***0.0091***	***0.0085***	***0.0080***	***0.0073***	***0.0079***	***0.0086***	***0.0092***	***0.0106***	***0.0118***	***0.0108***	***0.0075***	***0.0057***	***0.0052***	***0.0045***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.45E-03	9.96E-04	7.00E-04	5.45E-04	4.63E-04	1.06E-03	2.41E-03	4.46E-03	7.86E-03	7.20E-03	6.05E-03	5.66E-03	5.33E-03	4.88E-03	5.30E-03	5.76E-03	6.14E-03	7.04E-03	7.88E-03	7.20E-03	5.01E-03	3.79E-03	3.47E-03	3.01E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	7.23E-04	4.98E-04	3.50E-04	2.73E-04	2.31E-04	5.30E-04	1.20E-03	2.23E-03	3.93E-03	3.60E-03	3.02E-03	2.83E-03	2.66E-03	2.44E-03	2.65E-03	2.88E-03	3.07E-03	3.52E-03	3.94E-03	3.60E-03	2.50E-03	1.90E-03	1.74E-03	1.50E-03
	Emission in each Box of 1st jet	g/s	1.81E-04	1.24E-04	8.75E-05	6.81E-05	5.78E-05	1.32E-04	3.01E-04	5.57E-04	9.83E-04	9.00E-04	7.56E-04	7.08E-04	6.66E-04	6.10E-04	6.62E-04	7.20E-04	7.68E-04	8.79E-04	9.85E-04	9.00E-04	6.26E-04	4.74E-04	4.34E-04	3.76E-04
	Emission in each Box of 2nd jet	g/s	1.03E-04	7.11E-05	5.00E-05	3.89E-05	3.30E-05	7.57E-05	1.72E-04	3.18E-04	5.62E-04	5.14E-04	4.32E-04	4.04E-04	3.80E-04	3.48E-04	3.79E-04	4.12E-04	4.39E-04	5.03E-04	5.63E-04	5.14E-04	3.58E-04	2.71E-04	2.48E-04	2.15E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0021***	***0.0019***	***0.0016***	***0.0015***	***0.0016***	***0.0014***	***0.0015***	***0.0017***	***0.0018***	***0.0021***	***0.0024***	***0.0022***	***0.0014***	***0.0010***	***0.0010***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.36E-04	1.83E-04	1.28E-04	9.75E-05	8.16E-05	1.27E-04	2.79E-04	6.40E-04	1.39E-03	1.28E-03	1.06E-03	9.76E-04	1.04E-03	9.35E-04	1.03E-03	1.13E-03	1.20E-03	1.39E-03	1.57E-03	1.44E-03	9.63E-04	7.00E-04	6.34E-04	5.50E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.18E-04	9.15E-05	6.39E-05	4.88E-05	4.08E-05	6.37E-05	1.39E-04	3.20E-04	6.96E-04	6.38E-04	5.29E-04	4.88E-04	5.18E-04	4.68E-04	5.16E-04	5.64E-04	6.00E-04	6.95E-04	7.87E-04	7.19E-04	4.82E-04	3.50E-04	3.17E-04	2.75E-04
	Emission in each Box of 1st jet	g/s	2.95E-05	2.29E-05	1.60E-05	1.22E-05	1.02E-05	1.59E-05	3.48E-05	7.99E-05	1.74E-04	1.59E-04	1.32E-04	1.22E-04	1.30E-04	1.17E-04	1.29E-04	1.41E-04	1.50E-04	1.74E-04	1.97E-04	1.80E-04	1.20E-04	8.75E-05	7.92E-05	6.88E-05
	Emission in each Box of 2nd jet	g/s	1.69E-05	1.31E-05	9.12E-06	6.97E-06	5.83E-06	9.10E-06	1.99E-05	4.57E-05	9.95E-05	9.11E-05	7.55E-05	6.97E-05	7.41E-05	6.68E-05	7.37E-05	8.06E-05	8.58E-05	9.93E-05	1.12E-04	1.03E-04	6.88E-05	5.00E-05	4.53E-05	3.93E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1321	0.1119	0.1137	0.1198	0.1257	0.2359	0.2515	0.1895	0.2252	0.2156	0.1976	0.1921	0.1551	0.1496	0.1544	0.1602	0.1637	0.1718	0.1774	0.1685	0.1422	0.1322	0.1292	0.1264
	NO2	g/vehicle/km	0.0221	0.0211	0.0213	0.0220	0.0227	0.0287	0.0294	0.0276	0.0405	0.0386	0.0349	0.0335	0.0306	0.0292	0.0305	0.0318	0.0325	0.0344	0.0361	0.0342	0.0279	0.0248	0.0241	0.0236
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0020***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0015***	***0.0034***	***0.0063***	***0.0111***	***0.0103***	***0.0087***	***0.0081***	***0.0076***	***0.0068***	***0.0075***	***0.0082***	***0.0087***	***0.0098***	***0.0107***	***0.0098***	***0.0068***	***0.0051***	***0.0047***	***0.0041***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.31E-03	8.97E-04	6.28E-04	4.92E-04	4.30E-04	1.00E-03	2.29E-03	4.18E-03	7.39E-03	6.86E-03	5.78E-03	5.39E-03	5.04E-03	4.55E-03	4.99E-03	5.44E-03	5.79E-03	6.56E-03	7.16E-03	6.54E-03	4.52E-03	3.43E-03	3.14E-03	2.71E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.55E-04	4.48E-04	3.14E-04	2.46E-04	2.15E-04	5.00E-04	1.14E-03	2.09E-03	3.70E-03	3.43E-03	2.89E-03	2.69E-03	2.52E-03	2.28E-03	2.49E-03	2.72E-03	2.90E-03	3.28E-03	3.58E-03	3.27E-03	2.26E-03	1.71E-03	1.57E-03	1.36E-03
	Emission in each Box of 1st jet	g/s	1.64E-04	1.12E-04	7.85E-05	6.15E-05	5.37E-05	1.25E-04	2.86E-04	5.23E-04	9.24E-04	8.58E-04	7.23E-04	6.73E-04	6.30E-04	5.69E-04	6.23E-04	6.80E-04	7.24E-04	8.20E-04	8.95E-04	8.17E-04	5.64E-04	4.29E-04	3.93E-04	3.39E-04
	Emission in each Box of 2nd jet	g/s	9.35E-05	6.40E-05	4.48E-05	3.51E-05	3.07E-05	7.15E-05	1.63E-04	2.99E-04	5.28E-04	4.90E-04	4.13E-04	3.85E-04	3.60E-04	3.25E-04	3.56E-04	3.88E-04	4.14E-04	4.69E-04	5.12E-04	4.67E-04	3.23E-04	2.45E-04	2.24E-04	1.94E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0020***	***0.0018***	***0.0015***	***0.0014***	***0.0015***	***0.0013***	***0.0015***	***0.0016***	***0.0017***	***0.0020***	***0.0022***	***0.0020***	***0.0013***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.19E-04	1.69E-04	1.18E-04	9.02E-05	7.75E-05	1.22E-04	2.67E-04	6.09E-04	1.33E-03	1.23E-03	1.02E-03	9.39E-04	9.94E-04	8.88E-04	9.85E-04	1.08E-03	1.15E-03	1.31E-03	1.46E-03	1.33E-03	8.87E-04	6.44E-04	5.85E-04	5.07E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.09E-04	8.45E-05	5.88E-05	4.51E-05	3.88E-05	6.08E-05	1.34E-04	3.05E-04	6.64E-04	6.14E-04	5.11E-04	4.69E-04	4.97E-04	4.44E-04	4.92E-04	5.40E-04	5.75E-04	6.57E-04	7.29E-04	6.65E-04	4.44E-04	3.22E-04	2.93E-04	2.54E-04
	Emission in each Box of 1st jet	g/s	2.73E-05	2.11E-05	1.47E-05	1.13E-05	9.69E-06	1.52E-05	3.34E-05	7.61E-05	1.66E-04	1.54E-04	1.28E-04	1.17E-04	1.24E-04	1.11E-04	1.23E-04	1.35E-04	1.44E-04	1.64E-04	1.82E-04	1.66E-04	1.11E-04	8.06E-05	7.32E-05	6.34E-05
	Emission in each Box of 2nd jet	g/s	1.56E-05	1.21E-05	8.40E-06	6.44E-06	5.54E-06	8.69E-06	1.91E-05	4.35E-05	9.49E-05	8.78E-05	7.29E-05	6.71E-05	7.10E-05	6.35E-05	7.03E-05	7.71E-05	8.21E-05	9.38E-05	1.04E-04	9.49E-05	6.34E-05	4.60E-05	4.18E-05	3.62E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1333	0.1117	0.1137	0.1198	0.1232	0.2301	0.2432	0.1865	0.2210	0.2091	0.1870	0.1821	0.1467	0.1435	0.1469	0.1526	0.1567	0.1662	0.1762	0.1686	0.1440	0.1324	0.1317	0.1293
	NO2	g/vehicle/km	0.0223	0.0211	0.0213	0.0221	0.0223	0.0280	0.0286	0.0272	0.0398	0.0375	0.0332	0.0320	0.0292	0.0282	0.0292	0.0306	0.0313	0.0335	0.0359	0.0342	0.0283	0.0250	0.0245	0.0242
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0020***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0015***	***0.0033***	***0.0062***	***0.0109***	***0.0100***	***0.0082***	***0.0077***	***0.0072***	***0.0066***	***0.0071***	***0.0078***	***0.0083***	***0.0095***	***0.0107***	***0.0098***	***0.0069***	***0.0052***	***0.0048***	***0.0042***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.32E-03	8.95E-04	6.27E-04	4.92E-04	4.21E-04	9.76E-04	2.21E-03	4.11E-03	7.25E-03	6.66E-03	5.47E-03	5.11E-03	4.77E-03	4.37E-03	4.75E-03	5.18E-03	5.54E-03	6.34E-03	7.12E-03	6.54E-03	4.57E-03	3.43E-03	3.20E-03	2.78E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.61E-04	4.47E-04	3.14E-04	2.46E-04	2.11E-04	4.88E-04	1.11E-03	2.06E-03	3.63E-03	3.33E-03	2.74E-03	2.55E-03	2.38E-03	2.18E-03	2.37E-03	2.59E-03	2.77E-03	3.17E-03	3.56E-03	3.27E-03	2.29E-03	1.72E-03	1.60E-03	1.39E-03
	Emission in each Box of 1st jet	g/s	1.65E-04	1.12E-04	7.84E-05	6.15E-05	5.26E-05	1.22E-04	2.76E-04	5.14E-04	9.07E-04	8.32E-04	6.84E-04	6.38E-04	5.96E-04	5.46E-04	5.93E-04	6.47E-04	6.93E-04	7.93E-04	8.90E-04	8.18E-04	5.72E-04	4.29E-04	4.00E-04	3.47E-04
	Emission in each Box of 2nd jet	g/s	9.44E-05	6.39E-05	4.48E-05	3.52E-05	3.01E-05	6.97E-05	1.58E-04	2.94E-04	5.18E-04	4.75E-04	3.91E-04	3.65E-04	3.41E-04	3.12E-04	3.39E-04	3.70E-04	3.96E-04	4.53E-04	5.08E-04	4.67E-04	3.27E-04	2.45E-04	2.29E-04	1.98E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0020***	***0.0018***	***0.0015***	***0.0013***	***0.0014***	***0.0013***	***0.0014***	***0.0016***	***0.0017***	***0.0019***	***0.0022***	***0.0020***	***0.0013***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.21E-04	1.69E-04	1.18E-04	9.06E-05	7.63E-05	1.19E-04	2.60E-04	5.99E-04	1.31E-03	1.19E-03	9.73E-04	8.97E-04	9.49E-04	8.58E-04	9.44E-04	1.04E-03	1.11E-03	1.28E-03	1.45E-03	1.33E-03	8.99E-04	6.47E-04	5.96E-04	5.19E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.10E-04	8.44E-05	5.88E-05	4.53E-05	3.82E-05	5.95E-05	1.30E-04	3.00E-04	6.53E-04	5.97E-04	4.86E-04	4.48E-04	4.74E-04	4.29E-04	4.72E-04	5.19E-04	5.54E-04	6.39E-04	7.25E-04	6.64E-04	4.49E-04	3.24E-04	2.98E-04	2.59E-04
	Emission in each Box of 1st jet	g/s	2.76E-05	2.11E-05	1.47E-05	1.13E-05	9.54E-06	1.49E-05	3.24E-05	7.49E-05	1.63E-04	1.49E-04	1.22E-04	1.12E-04	1.19E-04	1.07E-04	1.18E-04	1.30E-04	1.39E-04	1.60E-04	1.81E-04	1.66E-04	1.12E-04	8.09E-05	7.45E-05	6.48E-05
	Emission in each Box of 2nd jet	g/s	1.58E-05	1.21E-05	8.40E-06	6.47E-06	5.45E-06	8.50E-06	1.85E-05	4.28E-05	9.33E-05	8.54E-05	6.95E-05	6.41E-05	6.78E-05	6.13E-05	6.74E-05	7.41E-05	7.91E-05	9.13E-05	1.04E-04	9.49E-05	6.42E-05	4.62E-05	4.26E-05	3.71E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1219	0.1035	0.1064	0.1121	0.1155	0.2184	0.2347	0.1861	0.2195	0.2085	0.1893	0.1823	0.1445	0.1418	0.1436	0.1492	0.1537	0.1607	0.1680	0.1585	0.1340	0.1230	0.1196	0.1150
	NO2	g/vehicle/km	0.0206	0.0198	0.0202	0.0209	0.0212	0.0268	0.0277	0.0272	0.0397	0.0376	0.0338	0.0322	0.0289	0.0280	0.0287	0.0300	0.0308	0.0326	0.0345	0.0325	0.0266	0.0234	0.0226	0.0218
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0018***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0014***	***0.0032***	***0.0062***	***0.0108***	***0.0100***	***0.0083***	***0.0077***	***0.0070***	***0.0065***	***0.0070***	***0.0076***	***0.0082***	***0.0092***	***0.0102***	***0.0092***	***0.0064***	***0.0048***	***0.0044***	***0.0037***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.21E-03	8.29E-04	5.87E-04	4.60E-04	3.95E-04	9.26E-04	2.13E-03	4.11E-03	7.20E-03	6.64E-03	5.54E-03	5.11E-03	4.70E-03	4.32E-03	4.64E-03	5.06E-03	5.44E-03	6.13E-03	6.78E-03	6.15E-03	4.25E-03	3.19E-03	2.91E-03	2.47E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.04E-04	4.15E-04	2.94E-04	2.30E-04	1.97E-04	4.63E-04	1.07E-03	2.05E-03	3.60E-03	3.32E-03	2.77E-03	2.56E-03	2.35E-03	2.16E-03	2.32E-03	2.53E-03	2.72E-03	3.07E-03	3.39E-03	3.08E-03	2.13E-03	1.59E-03	1.45E-03	1.24E-03
	Emission in each Box of 1st jet	g/s	1.51E-04	1.04E-04	7.34E-05	5.75E-05	4.93E-05	1.16E-04	2.67E-04	5.13E-04	9.00E-04	8.30E-04	6.93E-04	6.39E-04	5.87E-04	5.40E-04	5.80E-04	6.33E-04	6.80E-04	7.67E-04	8.48E-04	7.69E-04	5.32E-04	3.99E-04	3.64E-04	3.09E-04
	Emission in each Box of 2nd jet	g/s	8.63E-05	5.92E-05	4.20E-05	3.29E-05	2.82E-05	6.62E-05	1.52E-04	2.93E-04	5.14E-04	4.74E-04	3.96E-04	3.65E-04	3.36E-04	3.08E-04	3.31E-04	3.62E-04	3.89E-04	4.38E-04	4.85E-04	4.39E-04	3.04E-04	2.28E-04	2.08E-04	1.76E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0020***	***0.0018***	***0.0015***	***0.0014***	***0.0014***	***0.0013***	***0.0014***	***0.0015***	***0.0016***	***0.0019***	***0.0021***	***0.0019***	***0.0013***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.05E-04	1.59E-04	1.12E-04	8.58E-05	7.23E-05	1.14E-04	2.51E-04	6.00E-04	1.30E-03	1.20E-03	9.88E-04	9.02E-04	9.39E-04	8.52E-04	9.28E-04	1.02E-03	1.09E-03	1.25E-03	1.39E-03	1.26E-03	8.46E-04	6.08E-04	5.49E-04	4.69E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.02E-04	7.94E-05	5.58E-05	4.29E-05	3.62E-05	5.68E-05	1.26E-04	3.00E-04	6.51E-04	5.99E-04	4.94E-04	4.51E-04	4.70E-04	4.26E-04	4.64E-04	5.09E-04	5.46E-04	6.23E-04	6.97E-04	6.31E-04	4.23E-04	3.04E-04	2.75E-04	2.34E-04
	Emission in each Box of 1st jet	g/s	2.56E-05	1.99E-05	1.40E-05	1.07E-05	9.04E-06	1.42E-05	3.14E-05	7.51E-05	1.63E-04	1.50E-04	1.24E-04	1.13E-04	1.17E-04	1.06E-04	1.16E-04	1.27E-04	1.36E-04	1.56E-04	1.74E-04	1.58E-04	1.06E-04	7.59E-05	6.86E-05	5.86E-05
	Emission in each Box of 2nd jet	g/s	1.46E-05	1.13E-05	7.98E-06	6.13E-06	5.17E-06	8.11E-06	1.80E-05	4.29E-05	9.30E-05	8.55E-05	7.06E-05	6.44E-05	6.71E-05	6.08E-05	6.63E-05	7.27E-05	7.79E-05	8.89E-05	9.96E-05	9.02E-05	6.04E-05	4.34E-05	3.92E-05	3.35E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 104B01-104B15
Enclosure Involvec: 104P2
Road Located: 106
Vehicle EF Adopte: 104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1173	0.0962	0.0973	0.1012	0.1039	0.1962	0.2078	0.1591	0.1930	0.1833	0.1685	0.1645	0.1324	0.1269	0.1320	0.1357	0.1375	0.1432	0.1503	0.1438	0.1227	0.1153	0.1131	0.1098
	NO2	g/vehicle/km	0.0199	0.0186	0.0187	0.0191	0.0193	0.0243	0.0247	0.0236	0.0354	0.0334	0.0304	0.0293	0.0267	0.0253	0.0266	0.0275	0.0278	0.0293	0.0312	0.0297	0.0246	0.0220	0.0214	0.0209
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0028***	***0.0053***	***0.0095***	***0.0088***	***0.0074***	***0.0069***	***0.0065***	***0.0058***	***0.0064***	***0.0069***	***0.0073***	***0.0082***	***0.0091***	***0.0084***	***0.0058***	***0.0045***	***0.0041***	***0.0035***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.16E-03	7.70E-04	5.37E-04	4.16E-04	3.55E-04	8.32E-04	1.89E-03	3.51E-03	6.34E-03	5.83E-03	4.93E-03	4.61E-03	4.31E-03	3.86E-03	4.26E-03	4.60E-03	4.87E-03	5.47E-03	6.07E-03	5.58E-03	3.90E-03	2.99E-03	2.75E-03	2.36E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.82E-04	3.85E-04	2.69E-04	2.08E-04	1.77E-04	4.16E-04	9.44E-04	1.76E-03	3.17E-03	2.92E-03	2.47E-03	2.31E-03	2.15E-03	1.93E-03	2.13E-03	2.30E-03	2.43E-03	2.73E-03	3.03E-03	2.79E-03	1.95E-03	1.50E-03	1.37E-03	1.18E-03
	Emission in each Box of 1st jet	g/s	1.45E-04	9.63E-05	6.72E-05	5.20E-05	4.44E-05	1.04E-04	2.36E-04	4.39E-04	7.92E-04	7.29E-04	6.16E-04	5.76E-04	5.38E-04	4.83E-04	5.33E-04	5.75E-04	6.08E-04	6.83E-04	7.58E-04	6.98E-04	4.87E-04	3.74E-04	3.44E-04	2.95E-04
	Emission in each Box of 2nd jet	g/s	8.31E-05	5.50E-05	3.84E-05	2.97E-05	2.54E-05	5.94E-05	1.35E-04	2.51E-04	4.53E-04	4.17E-04	3.52E-04	3.29E-04	3.08E-04	2.76E-04	3.05E-04	3.29E-04	3.48E-04	3.90E-04	4.33E-04	3.99E-04	2.78E-04	2.14E-04	1.96E-04	1.68E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0017***	***0.0016***	***0.0013***	***0.0012***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0015***	***0.0017***	***0.0019***	***0.0017***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.97E-04	1.49E-04	1.03E-04	7.86E-05	6.61E-05	1.03E-04	2.25E-04	5.21E-04	1.16E-03	1.06E-03	8.89E-04	8.20E-04	8.67E-04	7.69E-04	8.58E-04	9.32E-04	9.86E-04	1.12E-03	1.26E-03	1.15E-03	7.80E-04	5.72E-04	5.21E-04	4.49E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.86E-05	7.44E-05	5.16E-05	3.93E-05	3.30E-05	5.15E-05	1.12E-04	2.61E-04	5.80E-04	5.32E-04	4.45E-04	4.10E-04	4.34E-04	3.85E-04	4.29E-04	4.66E-04	4.93E-04	5.59E-04	6.30E-04	5.77E-04	3.90E-04	2.86E-04	2.61E-04	2.24E-04
	Emission in each Box of 1st jet	g/s	2.46E-05	1.86E-05	1.29E-05	9.82E-06	8.26E-06	1.29E-05	2.81E-05	6.52E-05	1.45E-04	1.33E-04	1.11E-04	1.03E-04	1.08E-04	9.61E-05	1.07E-04	1.16E-04	1.23E-04	1.40E-04	1.57E-04	1.44E-04	9.76E-05	7.15E-05	6.51E-05	5.61E-05
	Emission in each Box of 2nd jet	g/s	1.41E-05	1.06E-05	7.38E-06	5.61E-06	4.72E-06	7.35E-06	1.60E-05	3.72E-05	8.29E-05	7.60E-05	6.35E-05	5.86E-05	6.19E-05	5.49E-05	6.13E-05	6.66E-05	7.04E-05	7.99E-05	9.00E-05	8.24E-05	5.57E-05	4.08E-05	3.72E-05	3.21E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1065	0.0908	0.0946	0.0976	0.0998	0.1872	0.1981	0.1567	0.1924	0.1805	0.1654	0.1585	0.1276	0.1272	0.1306	0.1354	0.1365	0.1451	0.1561	0.1461	0.1243	0.1155	0.1120	0.1113
	NO2	g/vehicle/km	0.0183	0.0177	0.0183	0.0185	0.0187	0.0233	0.0237	0.0232	0.0352	0.0330	0.0299	0.0282	0.0258	0.0253	0.0263	0.0274	0.0277	0.0297	0.0323	0.0302	0.0249	0.0221	0.0212	0.0212
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0027***	***0.0052***	***0.0095***	***0.0086***	***0.0073***	***0.0067***	***0.0062***	***0.0058***	***0.0063***	***0.0069***	***0.0072***	***0.0083***	***0.0095***	***0.0085***	***0.0059***	***0.0045***	***0.0041***	***0.0036***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.06E-03	7.28E-04	5.22E-04	4.01E-04	3.41E-04	7.94E-04	1.80E-03	3.46E-03	6.31E-03	5.74E-03	4.84E-03	4.45E-03	4.15E-03	3.87E-03	4.22E-03	4.59E-03	4.83E-03	5.54E-03	6.30E-03	5.67E-03	3.95E-03	3.00E-03	2.72E-03	2.39E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.28E-04	3.64E-04	2.61E-04	2.00E-04	1.70E-04	3.97E-04	9.00E-04	1.73E-03	3.16E-03	2.87E-03	2.42E-03	2.22E-03	2.07E-03	1.94E-03	2.11E-03	2.30E-03	2.42E-03	2.77E-03	3.15E-03	2.83E-03	1.97E-03	1.50E-03	1.36E-03	1.19E-03
	Emission in each Box of 1st jet	g/s	1.32E-04	9.10E-05	6.53E-05	5.01E-05	4.26E-05	9.93E-05	2.25E-04	4.32E-04	7.89E-04	7.18E-04	6.05E-04	5.56E-04	5.19E-04	4.84E-04	5.27E-04	5.74E-04	6.04E-04	6.93E-04	7.88E-04	7.09E-04	4.93E-04	3.75E-04	3.40E-04	2.99E-04
	Emission in each Box of 2nd jet	g/s	7.54E-05	5.20E-05	3.73E-05	2.86E-05	2.43E-05	5.67E-05	1.29E-04	2.47E-04	4.51E-04	4.10E-04	3.46E-04	3.18E-04	2.96E-04	2.77E-04	3.01E-04	3.28E-04	3.45E-04	3.96E-04	4.50E-04	4.05E-04	2.82E-04	2.14E-04	1.95E-04	1.71E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0016***	***0.0013***	***0.0012***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0015***	***0.0017***	***0.0020***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.81E-04	1.42E-04	1.01E-04	7.61E-05	6.38E-05	9.86E-05	2.15E-04	5.13E-04	1.15E-03	1.05E-03	8.74E-04	7.92E-04	8.39E-04	7.71E-04	8.51E-04	9.31E-04	9.79E-04	1.13E-03	1.30E-03	1.17E-03	7.90E-04	5.73E-04	5.16E-04	4.54E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.05E-05	7.09E-05	5.04E-05	3.81E-05	3.19E-05	4.93E-05	1.08E-04	2.56E-04	5.77E-04	5.25E-04	4.37E-04	3.96E-04	4.19E-04	3.85E-04	4.25E-04	4.65E-04	4.90E-04	5.67E-04	6.51E-04	5.87E-04	3.95E-04	2.87E-04	2.58E-04	2.27E-04
	Emission in each Box of 1st jet	g/s	2.26E-05	1.77E-05	1.26E-05	9.51E-06	7.97E-06	1.23E-05	2.69E-05	6.41E-05	1.44E-04	1.31E-04	1.09E-04	9.90E-05	1.05E-04	9.63E-05	1.06E-04	1.16E-04	1.22E-04	1.42E-04	1.63E-04	1.47E-04	9.87E-05	7.16E-05	6.46E-05	5.68E-05
	Emission in each Box of 2nd jet	g/s	1.29E-05	1.01E-05	7.20E-06	5.44E-06	4.56E-06	7.05E-06	1.54E-05	3.66E-05	8.24E-05	7.50E-05	6.24E-05	5.66E-05	5.99E-05	5.50E-05	6.08E-05	6.65E-05	6.99E-05	8.10E-05	9.31E-05	8.38E-05	5.64E-05	4.09E-05	3.69E-05	3.25E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1042	0.0876	0.0906	0.0933	0.0940	0.1824	0.1902	0.1494	0.1821	0.1806	0.1681	0.1664	0.1324	0.1293	0.1333	0.1392	0.1353	0.1432	0.1509	0.1403	0.1161	0.1079	0.1048	0.1010
	NO2	g/vehicle/km	0.0178	0.0171	0.0175	0.0178	0.0176	0.0226	0.0227	0.0223	0.0334	0.0330	0.0303	0.0296	0.0267	0.0257	0.0268	0.0282	0.0274	0.0293	0.0313	0.0291	0.0233	0.0208	0.0200	0.0194
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0026***	***0.0049***	***0.0090***	***0.0086***	***0.0074***	***0.0070***	***0.0065***	***0.0059***	***0.0065***	***0.0071***	***0.0072***	***0.0082***	***0.0091***	***0.0082***	***0.0055***	***0.0042***	***0.0038***	***0.0033***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.03E-03	7.02E-04	5.00E-04	3.83E-04	3.21E-04	7.74E-04	1.73E-03	3.30E-03	5.98E-03	5.75E-03	4.92E-03	4.67E-03	4.31E-03	3.94E-03	4.30E-03	4.72E-03	4.79E-03	5.47E-03	6.09E-03	5.44E-03	3.69E-03	2.80E-03	2.55E-03	2.17E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.16E-04	3.51E-04	2.50E-04	1.92E-04	1.61E-04	3.87E-04	8.64E-04	1.65E-03	2.99E-03	2.87E-03	2.46E-03	2.33E-03	2.15E-03	1.97E-03	2.15E-03	2.36E-03	2.39E-03	2.73E-03	3.05E-03	2.72E-03	1.84E-03	1.40E-03	1.27E-03	1.08E-03
	Emission in each Box of 1st jet	g/s	1.29E-04	8.77E-05	6.25E-05	4.79E-05	4.01E-05	9.67E-05	2.16E-04	4.12E-04	7.47E-04	7.19E-04	6.15E-04	5.83E-04	5.38E-04	4.92E-04	5.38E-04	5.90E-04	5.99E-04	6.83E-04	7.62E-04	6.80E-04	4.61E-04	3.50E-04	3.19E-04	2.71E-04
	Emission in each Box of 2nd jet	g/s	7.38E-05	5.01E-05	3.57E-05	2.74E-05	2.29E-05	5.53E-05	1.23E-04	2.35E-04	4.27E-04	4.11E-04	3.51E-04	3.33E-04	3.08E-04	2.81E-04	3.07E-04	3.37E-04	3.42E-04	3.91E-04	4.35E-04	3.89E-04	2.63E-04	2.00E-04	1.82E-04	1.55E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0016***	***0.0013***	***0.0012***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0015***	***0.0017***	***0.0019***	***0.0017***	***0.0011***	***0.0008***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.77E-04	1.37E-04	9.67E-05	7.29E-05	6.03E-05	9.60E-05	2.07E-04	4.91E-04	1.10E-03	1.05E-03	8.87E-04	8.29E-04	8.67E-04	7.82E-04	8.66E-04	9.57E-04	9.71E-04	1.12E-03	1.26E-03	1.13E-03	7.40E-04	5.39E-04	4.87E-04	4.17E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.83E-05	6.84E-05	4.84E-05	3.65E-05	3.01E-05	4.80E-05	1.03E-04	2.45E-04	5.49E-04	5.25E-04	4.44E-04	4.15E-04	4.34E-04	3.91E-04	4.33E-04	4.78E-04	4.85E-04	5.59E-04	6.32E-04	5.64E-04	3.70E-04	2.69E-04	2.43E-04	2.08E-04
	Emission in each Box of 1st jet	g/s	2.21E-05	1.71E-05	1.21E-05	9.12E-06	7.54E-06	1.20E-05	2.58E-05	6.14E-05	1.37E-04	1.31E-04	1.11E-04	1.04E-04	1.08E-04	9.78E-05	1.08E-04	1.20E-04	1.21E-04	1.40E-04	1.58E-04	1.41E-04	9.25E-05	6.74E-05	6.09E-05	5.21E-05
	Emission in each Box of 2nd jet	g/s	1.26E-05	9.78E-06	6.91E-06	5.21E-06	4.31E-06	6.86E-06	1.48E-05	3.51E-05	7.84E-05	7.50E-05	6.34E-05	5.92E-05	6.19E-05	5.59E-05	6.19E-05	6.83E-05	6.94E-05	7.98E-05	9.02E-05	8.06E-05	5.28E-05	3.85E-05	3.48E-05	2.98E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1103	0.0900	0.0938	0.0984	0.0998	0.1864	0.1973	0.1487	0.1839	0.1769	0.1643	0.1591	0.1287	0.1290	0.1335	0.1373	0.1446	0.1501	0.1596	0.1485	0.1217	0.1095	0.1088	0.1065
	NO2	g/vehicle/km	0.0188	0.0176	0.0181	0.0187	0.0187	0.0232	0.0236	0.0221	0.0337	0.0324	0.0297	0.0284	0.0260	0.0257	0.0269	0.0278	0.0292	0.0306	0.0329	0.0307	0.0244	0.0211	0.0207	0.0203
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0027***	***0.0049***	***0.0091***	***0.0084***	***0.0072***	***0.0067***	***0.0063***	***0.0059***	***0.0065***	***0.0070***	***0.0077***	***0.0086***	***0.0097***	***0.0086***	***0.0058***	***0.0043***	***0.0040***	***0.0034***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.09E-03	7.21E-04	5.18E-04	4.04E-04	3.41E-04	7.91E-04	1.79E-03	3.28E-03	6.04E-03	5.63E-03	4.81E-03	4.46E-03	4.19E-03	3.93E-03	4.31E-03	4.66E-03	5.12E-03	5.73E-03	6.44E-03	5.76E-03	3.87E-03	2.84E-03	2.65E-03	2.29E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.47E-04	3.61E-04	2.59E-04	2.02E-04	1.70E-04	3.95E-04	8.97E-04	1.64E-03	3.02E-03	2.82E-03	2.40E-03	2.23E-03	2.09E-03	1.96E-03	2.16E-03	2.33E-03	2.56E-03	2.86E-03	3.22E-03	2.88E-03	1.93E-03	1.42E-03	1.32E-03	1.14E-03
	Emission in each Box of 1st jet	g/s	1.37E-04	9.02E-05	6.47E-05	5.05E-05	4.26E-05	9.88E-05	2.24E-04	4.10E-04	7.55E-04	7.04E-04	6.01E-04	5.58E-04	5.23E-04	4.91E-04	5.39E-04	5.82E-04	6.40E-04	7.16E-04	8.06E-04	7.21E-04	4.83E-04	3.55E-04	3.31E-04	2.86E-04
	Emission in each Box of 2nd jet	g/s	7.81E-05	5.15E-05	3.70E-05	2.89E-05	2.43E-05	5.65E-05	1.28E-04	2.34E-04	4.31E-04	4.02E-04	3.43E-04	3.19E-04	2.99E-04	2.81E-04	3.08E-04	3.33E-04	3.66E-04	4.09E-04	4.60E-04	4.12E-04	2.76E-04	2.03E-04	1.89E-04	1.63E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0017***	***0.0015***	***0.0013***	***0.0012***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0016***	***0.0018***	***0.0020***	***0.0018***	***0.0012***	***0.0008***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.87E-04	1.41E-04	1.00E-04	7.67E-05	6.38E-05	9.82E-05	2.14E-04	4.89E-04	1.11E-03	1.03E-03	8.69E-04	7.96E-04	8.45E-04	7.81E-04	8.67E-04	9.43E-04	1.03E-03	1.17E-03	1.33E-03	1.19E-03	7.75E-04	5.47E-04	5.04E-04	4.37E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.33E-05	7.04E-05	5.01E-05	3.84E-05	3.19E-05	4.91E-05	1.07E-04	2.44E-04	5.54E-04	5.15E-04	4.34E-04	3.98E-04	4.22E-04	3.91E-04	4.34E-04	4.71E-04	5.17E-04	5.85E-04	6.65E-04	5.95E-04	3.88E-04	2.73E-04	2.52E-04	2.18E-04
	Emission in each Box of 1st jet	g/s	2.33E-05	1.76E-05	1.25E-05	9.59E-06	7.97E-06	1.23E-05	2.68E-05	6.11E-05	1.38E-04	1.29E-04	1.09E-04	9.96E-05	1.06E-04	9.77E-05	1.08E-04	1.18E-04	1.29E-04	1.46E-04	1.66E-04	1.49E-04	9.69E-05	6.84E-05	6.30E-05	5.46E-05
	Emission in each Box of 2nd jet	g/s	1.33E-05	1.01E-05	7.15E-06	5.48E-06	4.56E-06	7.02E-06	1.53E-05	3.49E-05	7.91E-05	7.36E-05	6.21E-05	5.69E-05	6.04E-05	5.58E-05	6.20E-05	6.73E-05	7.38E-05	8.36E-05	9.50E-05	8.51E-05	5.54E-05	3.91E-05	3.60E-05	3.12E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1095	0.0922	0.0925	0.0943	0.0992	0.1815	0.1930	0.1462	0.1759	0.1690	0.1629	0.1519	0.1266	0.1254	0.1325	0.1301	0.1299	0.1420	0.1523	0.1417	0.1216	0.1106	0.1086	0.1053
	NO2	g/vehicle/km	0.0187	0.0179	0.0179	0.0179	0.0186	0.0225	0.0230	0.0218	0.0324	0.0310	0.0294	0.0271	0.0256	0.0250	0.0267	0.0264	0.0264	0.0291	0.0315	0.0293	0.0244	0.0213	0.0207	0.0201
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0026***	***0.0048***	***0.0087***	***0.0081***	***0.0072***	***0.0064***	***0.0062***	***0.0057***	***0.0064***	***0.0066***	***0.0069***	***0.0081***	***0.0092***	***0.0083***	***0.0058***	***0.0043***	***0.0040***	***0.0034***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.09E-03	7.39E-04	5.10E-04	3.87E-04	3.39E-04	7.70E-04	1.75E-03	3.23E-03	5.77E-03	5.38E-03	4.77E-03	4.26E-03	4.12E-03	3.82E-03	4.28E-03	4.42E-03	4.60E-03	5.42E-03	6.15E-03	5.50E-03	3.86E-03	2.87E-03	2.64E-03	2.26E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.43E-04	3.69E-04	2.55E-04	1.94E-04	1.70E-04	3.85E-04	8.77E-04	1.61E-03	2.89E-03	2.69E-03	2.38E-03	2.13E-03	2.06E-03	1.91E-03	2.14E-03	2.21E-03	2.30E-03	2.71E-03	3.07E-03	2.75E-03	1.93E-03	1.43E-03	1.32E-03	1.13E-03
	Emission in each Box of 1st jet	g/s	1.36E-04	9.23E-05	6.38E-05	4.84E-05	4.24E-05	9.62E-05	2.19E-04	4.03E-04	7.22E-04	6.72E-04	5.96E-04	5.33E-04	5.15E-04	4.77E-04	5.35E-04	5.52E-04	5.75E-04	6.77E-04	7.68E-04	6.88E-04	4.83E-04	3.59E-04	3.30E-04	2.83E-04
	Emission in each Box of 2nd jet	g/s	7.75E-05	5.28E-05	3.65E-05	2.77E-05	2.42E-05	5.50E-05	1.25E-04	2.30E-04	4.12E-04	3.84E-04	3.40E-04	3.04E-04	2.94E-04	2.73E-04	3.06E-04	3.15E-04	3.28E-04	3.87E-04	4.39E-04	3.93E-04	2.76E-04	2.05E-04	1.89E-04	1.61E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0015***	***0.0013***	***0.0011***	***0.0012***	***0.0011***	***0.0013***	***0.0013***	***0.0014***	***0.0017***	***0.0019***	***0.0017***	***0.0012***	***0.0008***	***0.0008***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.85E-04	1.44E-04	9.88E-05	7.36E-05	6.34E-05	9.56E-05	2.09E-04	4.81E-04	1.06E-03	9.87E-04	8.62E-04	7.61E-04	8.31E-04	7.60E-04	8.62E-04	8.97E-04	9.35E-04	1.11E-03	1.27E-03	1.14E-03	7.74E-04	5.51E-04	5.02E-04	4.32E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.27E-05	7.18E-05	4.94E-05	3.68E-05	3.17E-05	4.78E-05	1.05E-04	2.40E-04	5.31E-04	4.94E-04	4.31E-04	3.80E-04	4.16E-04	3.80E-04	4.31E-04	4.48E-04	4.67E-04	5.54E-04	6.37E-04	5.70E-04	3.87E-04	2.76E-04	2.51E-04	2.16E-04
	Emission in each Box of 1st jet	g/s	2.32E-05	1.80E-05	1.23E-05	9.19E-06	7.93E-06	1.20E-05	2.62E-05	6.01E-05	1.33E-04	1.23E-04	1.08E-04	9.51E-05	1.04E-04	9.51E-05	1.08E-04	1.12E-04	1.17E-04	1.39E-04	1.59E-04	1.42E-04	9.68E-05	6.89E-05	6.28E-05	5.40E-05
	Emission in each Box of 2nd jet	g/s	1.32E-05	1.03E-05	7.06E-06	5.25E-06	4.53E-06	6.83E-06	1.50E-05	3.44E-05	7.59E-05	7.05E-05	6.16E-05	5.43E-05	5.94E-05	5.43E-05	6.15E-05	6.40E-05	6.68E-05	7.92E-05	9.10E-05	8.14E-05	5.53E-05	3.94E-05	3.59E-05	3.09E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involved	104P2
Road Located	106
Vehicle EF Adopted	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1254	0.1072	0.1081	0.1121	0.1156	0.2198	0.2312	0.1757	0.2107	0.1999	0.1827	0.1787	0.1452	0.1406	0.1432	0.1504	0.1505	0.1600	0.1716	0.1609	0.1375	0.1251	0.1240	0.1225
	NO2	g/vehicle/km	0.0211	0.0204	0.0205	0.0209	0.0212	0.0269	0.0273	0.0258	0.0382	0.0362	0.0327	0.0315	0.0290	0.0277	0.0286	0.0302	0.0302	0.0324	0.0351	0.0330	0.0272	0.0237	0.0232	0.0230
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0019***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0014***	***0.0032***	***0.0058***	***0.0104***	***0.0095***	***0.0080***	***0.0075***	***0.0071***	***0.0064***	***0.0069***	***0.0077***	***0.0080***	***0.0092***	***0.0104***	***0.0094***	***0.0065***	***0.0049***	***0.0045***	***0.0039***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.24E-03	8.59E-04	5.97E-04	4.60E-04	3.95E-04	9.32E-04	2.10E-03	3.88E-03	6.91E-03	6.36E-03	5.35E-03	5.01E-03	4.72E-03	4.28E-03	4.63E-03	5.10E-03	5.33E-03	6.11E-03	6.93E-03	6.25E-03	4.37E-03	3.24E-03	3.02E-03	2.63E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.21E-04	4.30E-04	2.99E-04	2.30E-04	1.97E-04	4.66E-04	1.05E-03	1.94E-03	3.46E-03	3.18E-03	2.67E-03	2.51E-03	2.36E-03	2.14E-03	2.31E-03	2.55E-03	2.66E-03	3.05E-03	3.46E-03	3.12E-03	2.18E-03	1.62E-03	1.51E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	1.55E-04	1.07E-04	7.46E-05	5.76E-05	4.94E-05	1.17E-04	2.63E-04	4.85E-04	8.64E-04	7.95E-04	6.69E-04	6.27E-04	5.90E-04	5.35E-04	5.78E-04	6.38E-04	6.66E-04	7.63E-04	8.66E-04	7.81E-04	5.46E-04	4.05E-04	3.77E-04	3.29E-04
	Emission in each Box of 2nd jet	g/s	8.88E-05	6.14E-05	4.26E-05	3.29E-05	2.82E-05	6.66E-05	1.50E-04	2.77E-04	4.94E-04	4.54E-04	3.82E-04	3.58E-04	3.37E-04	3.06E-04	3.30E-04	3.64E-04	3.80E-04	4.36E-04	4.95E-04	4.46E-04	3.12E-04	2.32E-04	2.15E-04	1.88E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0019***	***0.0017***	***0.0014***	***0.0013***	***0.0014***	***0.0013***	***0.0014***	***0.0015***	***0.0016***	***0.0019***	***0.0021***	***0.0019***	***0.0013***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.09E-04	1.63E-04	1.13E-04	8.58E-05	7.23E-05	1.14E-04	2.48E-04	5.69E-04	1.25E-03	1.15E-03	9.57E-04	8.84E-04	9.42E-04	8.44E-04	9.25E-04	1.02E-03	1.07E-03	1.24E-03	1.42E-03	1.28E-03	8.63E-04	6.15E-04	5.65E-04	4.94E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.05E-04	8.16E-05	5.66E-05	4.29E-05	3.61E-05	5.70E-05	1.24E-04	2.85E-04	6.26E-04	5.76E-04	4.79E-04	4.42E-04	4.71E-04	4.22E-04	4.62E-04	5.12E-04	5.35E-04	6.19E-04	7.09E-04	6.40E-04	4.32E-04	3.08E-04	2.83E-04	2.47E-04
	Emission in each Box of 1st jet	g/s	2.61E-05	2.04E-05	1.41E-05	1.07E-05	9.03E-06	1.42E-05	3.10E-05	7.12E-05	1.57E-04	1.44E-04	1.20E-04	1.11E-04	1.18E-04	1.05E-04	1.16E-04	1.28E-04	1.34E-04	1.55E-04	1.77E-04	1.60E-04	1.08E-04	7.69E-05	7.07E-05	6.18E-05
	Emission in each Box of 2nd jet	g/s	1.49E-05	1.17E-05	8.08E-06	6.13E-06	5.16E-06	8.14E-06	1.77E-05	4.07E-05	8.94E-05	8.23E-05	6.84E-05	6.32E-05	6.73E-05	6.03E-05	6.60E-05	7.31E-05	7.64E-05	8.84E-05	1.01E-04	9.14E-05	6.17E-05	4.40E-05	4.04E-05	3.53E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 104B01-104B15
Enclosure Involvec: 104P2
Road Located: 106
Vehicle EF Adopte: 104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1378	0.1155	0.1185	0.1235	0.1269	0.2384	0.2534	0.1906	0.2287	0.2162	0.1985	0.1913	0.1564	0.1530	0.1564	0.1614	0.1621	0.1712	0.1834	0.1752	0.1478	0.1373	0.1352	0.1330
	NO2	g/vehicle/km	0.0229	0.0218	0.0221	0.0226	0.0229	0.0290	0.0297	0.0278	0.0410	0.0388	0.0351	0.0334	0.0308	0.0298	0.0309	0.0321	0.0322	0.0344	0.0372	0.0355	0.0290	0.0257	0.0251	0.0247
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0020***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0015***	***0.0035***	***0.0063***	***0.0113***	***0.0103***	***0.0087***	***0.0080***	***0.0076***	***0.0070***	***0.0076***	***0.0082***	***0.0086***	***0.0098***	***0.0111***	***0.0102***	***0.0070***	***0.0053***	***0.0049***	***0.0043***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.37E-03	9.25E-04	6.54E-04	5.07E-04	4.34E-04	1.01E-03	2.30E-03	4.20E-03	7.51E-03	6.88E-03	5.81E-03	5.36E-03	5.09E-03	4.66E-03	5.05E-03	5.48E-03	5.74E-03	6.53E-03	7.40E-03	6.80E-03	4.70E-03	3.56E-03	3.29E-03	2.86E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.83E-04	4.63E-04	3.27E-04	2.54E-04	2.17E-04	5.06E-04	1.15E-03	2.10E-03	3.75E-03	3.44E-03	2.91E-03	2.68E-03	2.54E-03	2.33E-03	2.53E-03	2.74E-03	2.87E-03	3.27E-03	3.70E-03	3.40E-03	2.35E-03	1.78E-03	1.64E-03	1.43E-03
	Emission in each Box of 1st jet	g/s	1.71E-04	1.16E-04	8.18E-05	6.34E-05	5.42E-05	1.26E-04	2.88E-04	5.26E-04	9.38E-04	8.60E-04	7.26E-04	6.70E-04	6.36E-04	5.82E-04	6.31E-04	6.85E-04	7.17E-04	8.17E-04	9.26E-04	8.50E-04	5.87E-04	4.45E-04	4.11E-04	3.57E-04
	Emission in each Box of 2nd jet	g/s	9.76E-05	6.61E-05	4.67E-05	3.62E-05	3.10E-05	7.22E-05	1.64E-04	3.00E-04	5.36E-04	4.92E-04	4.15E-04	3.83E-04	3.63E-04	3.33E-04	3.61E-04	3.91E-04	4.10E-04	4.67E-04	5.29E-04	4.86E-04	3.35E-04	2.54E-04	2.35E-04	2.04E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0020***	***0.0019***	***0.0015***	***0.0014***	***0.0015***	***0.0014***	***0.0015***	***0.0016***	***0.0017***	***0.0020***	***0.0023***	***0.0021***	***0.0014***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.27E-04	1.74E-04	1.22E-04	9.30E-05	7.83E-05	1.23E-04	2.70E-04	6.14E-04	1.35E-03	1.23E-03	1.03E-03	9.37E-04	1.00E-03	9.07E-04	9.98E-04	1.09E-03	1.14E-03	1.31E-03	1.50E-03	1.38E-03	9.20E-04	6.67E-04	6.10E-04	5.31E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.13E-04	8.72E-05	6.10E-05	4.65E-05	3.91E-05	6.14E-05	1.35E-04	3.07E-04	6.73E-04	6.17E-04	5.14E-04	4.68E-04	5.01E-04	4.53E-04	4.99E-04	5.44E-04	5.70E-04	6.57E-04	7.52E-04	6.89E-04	4.60E-04	3.34E-04	3.05E-04	2.65E-04
	Emission in each Box of 1st jet	g/s	2.84E-05	2.18E-05	1.53E-05	1.16E-05	9.79E-06	1.54E-05	3.37E-05	7.67E-05	1.68E-04	1.54E-04	1.28E-04	1.17E-04	1.25E-04	1.13E-04	1.25E-04	1.36E-04	1.43E-04	1.64E-04	1.88E-04	1.72E-04	1.15E-04	8.34E-05	7.63E-05	6.64E-05
	Emission in each Box of 2nd jet	g/s	1.62E-05	1.25E-05	8.72E-06	6.64E-06	5.59E-06	8.78E-06	1.93E-05	4.38E-05	9.61E-05	8.81E-05	7.34E-05	6.69E-05	7.16E-05	6.48E-05	7.13E-05	7.77E-05	8.14E-05	9.38E-05	1.07E-04	9.85E-05	6.57E-05	4.77E-05	4.36E-05	3.79E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1439	0.1215	0.1246	0.1301	0.1330	0.2464	0.2620	0.1985	0.2364	0.2233	0.2051	0.1990	0.1620	0.1574	0.1611	0.1667	0.1685	0.1799	0.1903	0.1817	0.1537	0.1426	0.1409	0.1390
	NO2	g/vehicle/km	0.0237	0.0225	0.0229	0.0235	0.0237	0.0297	0.0304	0.0287	0.0421	0.0397	0.0359	0.0344	0.0316	0.0304	0.0316	0.0328	0.0332	0.0357	0.0383	0.0365	0.0298	0.0265	0.0258	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0021***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0016***	***0.0036***	***0.0066***	***0.0116***	***0.0107***	***0.0090***	***0.0084***	***0.0079***	***0.0072***	***0.0078***	***0.0085***	***0.0089***	***0.0103***	***0.0115***	***0.0106***	***0.0073***	***0.0055***	***0.0051***	***0.0045***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.43E-03	9.74E-04	6.88E-04	5.34E-04	4.55E-04	1.05E-03	2.38E-03	4.38E-03	7.76E-03	7.11E-03	6.00E-03	5.58E-03	5.27E-03	4.79E-03	5.20E-03	5.66E-03	5.96E-03	6.87E-03	7.69E-03	7.05E-03	4.88E-03	3.70E-03	3.43E-03	2.98E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	7.13E-04	4.87E-04	3.44E-04	2.67E-04	2.27E-04	5.23E-04	1.19E-03	2.19E-03	3.88E-03	3.55E-03	3.00E-03	2.79E-03	2.63E-03	2.40E-03	2.60E-03	2.83E-03	2.98E-03	3.43E-03	3.84E-03	3.53E-03	2.44E-03	1.85E-03	1.71E-03	1.49E-03
	Emission in each Box of 1st jet	g/s	1.78E-04	1.22E-04	8.60E-05	6.68E-05	5.68E-05	1.31E-04	2.98E-04	5.48E-04	9.70E-04	8.89E-04	7.50E-04	6.98E-04	6.58E-04	5.99E-04	6.51E-04	7.07E-04	7.45E-04	8.58E-04	9.61E-04	8.81E-04	6.10E-04	4.62E-04	4.28E-04	3.73E-04
	Emission in each Box of 2nd jet	g/s	1.02E-04	6.95E-05	4.91E-05	3.82E-05	3.25E-05	7.47E-05	1.70E-04	3.13E-04	5.54E-04	5.08E-04	4.29E-04	3.99E-04	3.76E-04	3.42E-04	3.72E-04	4.04E-04	4.26E-04	4.90E-04	5.49E-04	5.04E-04	3.49E-04	2.64E-04	2.45E-04	2.13E-04
NO_2 Emission Rate		g/s	***0.0004***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0021***	***0.0019***	***0.0016***	***0.0014***	***0.0015***	***0.0014***	***0.0015***	***0.0017***	***0.0018***	***0.0020***	***0.0023***	***0.0021***	***0.0014***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.35E-04	1.81E-04	1.26E-04	9.64E-05	8.09E-05	1.26E-04	2.77E-04	6.32E-04	1.38E-03	1.26E-03	1.05E-03	9.65E-04	1.03E-03	9.26E-04	1.02E-03	1.11E-03	1.18E-03	1.36E-03	1.55E-03	1.42E-03	9.47E-04	6.87E-04	6.28E-04	5.49E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.17E-04	9.03E-05	6.32E-05	4.82E-05	4.04E-05	6.31E-05	1.38E-04	3.16E-04	6.90E-04	6.31E-04	5.26E-04	4.83E-04	5.14E-04	4.63E-04	5.10E-04	5.57E-04	5.88E-04	6.82E-04	7.73E-04	7.08E-04	4.73E-04	3.43E-04	3.14E-04	2.74E-04
	Emission in each Box of 1st jet	g/s	2.93E-05	2.26E-05	1.58E-05	1.21E-05	1.01E-05	1.58E-05	3.46E-05	7.90E-05	1.73E-04	1.58E-04	1.31E-04	1.21E-04	1.29E-04	1.16E-04	1.28E-04	1.39E-04	1.47E-04	1.71E-04	1.93E-04	1.77E-04	1.18E-04	8.58E-05	7.85E-05	6.86E-05
	Emission in each Box of 2nd jet	g/s	1.68E-05	1.29E-05	9.03E-06	6.89E-06	5.78E-06	9.01E-06	1.98E-05	4.52E-05	9.86E-05	9.02E-05	7.51E-05	6.89E-05	7.34E-05	6.61E-05	7.29E-05	7.96E-05	8.39E-05	9.75E-05	1.10E-04	1.01E-04	6.76E-05	4.90E-05	4.49E-05	3.92E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involved	104P3
Road Located	089
Vehicle EF Adopted	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1458	0.1243	0.1268	0.1327	0.1354	0.2499	0.2648	0.2020	0.2395	0.2261	0.2066	0.2019	0.1638	0.1602	0.1641	0.1698	0.1736	0.1843	0.1952	0.1856	0.1577	0.1462	0.1428	0.1399
	NO2	g/vehicle/km	0.0238	0.0228	0.0231	0.0237	0.0239	0.0300	0.0307	0.0290	0.0424	0.0401	0.0361	0.0348	0.0319	0.0307	0.0320	0.0332	0.0339	0.0364	0.0390	0.0370	0.0303	0.0270	0.0261	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0020***	***0.0014***	***0.0010***	***0.0008***	***0.0006***	***0.0014***	***0.0031***	***0.0061***	***0.0109***	***0.0100***	***0.0084***	***0.0078***	***0.0050***	***0.0046***	***0.0050***	***0.0054***	***0.0058***	***0.0066***	***0.0074***	***0.0068***	***0.0047***	***0.0036***	***0.0033***	***0.0028***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.34E-03	9.33E-04	6.51E-04	5.03E-04	4.31E-04	9.17E-04	2.09E-03	4.05E-03	7.26E-03	6.65E-03	5.57E-03	5.21E-03	3.34E-03	3.06E-03	3.32E-03	3.61E-03	3.85E-03	4.40E-03	4.93E-03	4.50E-03	3.14E-03	2.38E-03	2.18E-03	1.88E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.69E-04	4.67E-04	3.25E-04	2.51E-04	2.15E-04	4.58E-04	1.04E-03	2.02E-03	3.63E-03	3.32E-03	2.79E-03	2.60E-03	1.67E-03	1.53E-03	1.66E-03	1.80E-03	1.92E-03	2.20E-03	2.47E-03	2.25E-03	1.57E-03	1.19E-03	1.09E-03	9.39E-04
	Emission in each Box of 1st jet	g/s	1.34E-04	9.33E-05	6.51E-05	5.03E-05	4.31E-05	9.17E-05	2.09E-04	4.05E-04	7.26E-04	6.65E-04	5.57E-04	5.21E-04	3.34E-04	3.06E-04	3.32E-04	3.61E-04	3.85E-04	4.40E-04	4.93E-04	4.50E-04	3.14E-04	2.38E-04	2.18E-04	1.88E-04
	Emission in each Box of 2nd jet	g/s	6.69E-05	4.67E-05	3.25E-05	2.51E-05	2.15E-05	4.58E-05	1.04E-04	2.02E-04	3.63E-04	3.32E-04	2.79E-04	2.60E-04	1.67E-04	1.53E-04	1.66E-04	1.80E-04	1.92E-04	2.20E-04	2.47E-04	2.25E-04	1.57E-04	1.19E-04	1.09E-04	9.39E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0019***	***0.0018***	***0.0015***	***0.0013***	***0.0010***	***0.0009***	***0.0010***	***0.0011***	***0.0011***	***0.0013***	***0.0015***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.19E-04	1.71E-04	1.19E-04	8.99E-05	7.60E-05	1.10E-04	2.42E-04	5.81E-04	1.29E-03	1.18E-03	9.75E-04	8.98E-04	6.49E-04	5.87E-04	6.46E-04	7.07E-04	7.52E-04	8.70E-04	9.85E-04	8.99E-04	6.04E-04	4.39E-04	3.97E-04	3.44E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.09E-04	8.57E-05	5.94E-05	4.50E-05	3.80E-05	5.51E-05	1.21E-04	2.91E-04	6.43E-04	5.89E-04	4.87E-04	4.49E-04	3.25E-04	2.93E-04	3.23E-04	3.53E-04	3.76E-04	4.35E-04	4.93E-04	4.50E-04	3.02E-04	2.20E-04	1.99E-04	1.72E-04
	Emission in each Box of 1st jet	g/s	2.19E-05	1.71E-05	1.19E-05	8.99E-06	7.60E-06	1.10E-05	2.42E-05	5.81E-05	1.29E-04	1.18E-04	9.75E-05	8.98E-05	6.49E-05	5.87E-05	6.46E-05	7.07E-05	7.52E-05	8.70E-05	9.85E-05	8.99E-05	6.04E-05	4.39E-05	3.97E-05	3.44E-05
	Emission in each Box of 2nd jet	g/s	1.09E-05	8.57E-06	5.94E-06	4.50E-06	3.80E-06	5.51E-06	1.21E-05	2.91E-05	6.43E-05	5.89E-05	4.87E-05	4.49E-05	3.25E-05	2.93E-05	3.23E-05	3.53E-05	3.76E-05	4.35E-05	4.93E-05	4.50E-05	3.02E-05	2.20E-05	1.99E-05	1.72E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1321	0.1119	0.1137	0.1198	0.1257	0.2359	0.2515	0.1895	0.2252	0.2156	0.1976	0.1921	0.1551	0.1496	0.1544	0.1602	0.1637	0.1718	0.1774	0.1685	0.1422	0.1322	0.1292	0.1264
	NO2	g/vehicle/km	0.0221	0.0211	0.0213	0.0220	0.0227	0.0287	0.0294	0.0276	0.0405	0.0386	0.0349	0.0335	0.0306	0.0292	0.0305	0.0318	0.0325	0.0344	0.0361	0.0342	0.0279	0.0248	0.0241	0.0236
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0018***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0030***	***0.0057***	***0.0102***	***0.0095***	***0.0080***	***0.0074***	***0.0047***	***0.0043***	***0.0047***	***0.0051***	***0.0054***	***0.0062***	***0.0067***	***0.0061***	***0.0042***	***0.0032***	***0.0030***	***0.0025***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.21E-03	8.40E-04	5.84E-04	4.54E-04	4.00E-04	8.66E-04	1.98E-03	3.80E-03	6.83E-03	6.34E-03	5.33E-03	4.95E-03	3.16E-03	2.86E-03	3.12E-03	3.41E-03	3.63E-03	4.11E-03	4.48E-03	4.09E-03	2.83E-03	2.15E-03	1.97E-03	1.70E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.06E-04	4.20E-04	2.92E-04	2.27E-04	2.00E-04	4.33E-04	9.90E-04	1.90E-03	3.41E-03	3.17E-03	2.67E-03	2.48E-03	1.58E-03	1.43E-03	1.56E-03	1.70E-03	1.81E-03	2.05E-03	2.24E-03	2.04E-03	1.42E-03	1.08E-03	9.85E-04	8.48E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.40E-05	5.84E-05	4.54E-05	4.00E-05	8.66E-05	1.98E-04	3.80E-04	6.83E-04	6.34E-04	5.33E-04	4.95E-04	3.16E-04	2.86E-04	3.12E-04	3.41E-04	3.63E-04	4.11E-04	4.48E-04	4.09E-04	2.83E-04	2.15E-04	1.97E-04	1.70E-04
	Emission in each Box of 2nd jet	g/s	6.06E-05	4.20E-05	2.92E-05	2.27E-05	2.00E-05	4.33E-05	9.90E-05	1.90E-04	3.41E-04	3.17E-04	2.67E-04	2.48E-04	1.58E-04	1.43E-04	1.56E-04	1.70E-04	1.81E-04	2.05E-04	2.24E-04	2.04E-04	1.42E-04	1.08E-04	9.85E-05	8.48E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0017***	***0.0014***	***0.0013***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0012***	***0.0014***	***0.0012***	***0.0008***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.02E-04	1.58E-04	1.09E-04	8.32E-05	7.22E-05	1.05E-04	2.31E-04	5.53E-04	1.23E-03	1.13E-03	9.41E-04	8.63E-04	6.22E-04	5.57E-04	6.17E-04	6.76E-04	7.20E-04	8.23E-04	9.12E-04	8.31E-04	5.56E-04	4.04E-04	3.67E-04	3.17E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.01E-04	7.92E-05	5.47E-05	4.16E-05	3.61E-05	5.26E-05	1.16E-04	2.77E-04	6.14E-04	5.67E-04	4.71E-04	4.32E-04	3.11E-04	2.79E-04	3.08E-04	3.38E-04	3.60E-04	4.11E-04	4.56E-04	4.16E-04	2.78E-04	2.02E-04	1.84E-04	1.58E-04
	Emission in each Box of 1st jet	g/s	2.02E-05	1.58E-05	1.09E-05	8.32E-06	7.22E-06	1.05E-05	2.31E-05	5.53E-05	1.23E-04	1.13E-04	9.41E-05	8.63E-05	6.22E-05	5.57E-05	6.17E-05	6.76E-05	7.20E-05	8.23E-05	9.12E-05	8.31E-05	5.56E-05	4.04E-05	3.67E-05	3.17E-05
	Emission in each Box of 2nd jet	g/s	1.01E-05	7.92E-06	5.47E-06	4.16E-06	3.61E-06	5.26E-06	1.16E-05	2.77E-05	6.14E-05	5.67E-05	4.71E-05	4.32E-05	3.11E-05	2.79E-05	3.08E-05	3.38E-05	3.60E-05	4.11E-05	4.56E-05	4.16E-05	2.78E-05	2.02E-05	1.84E-05	1.58E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1333	0.1117	0.1137	0.1198	0.1232	0.2301	0.2432	0.1865	0.2210	0.2091	0.1870	0.1821	0.1467	0.1435	0.1469	0.1526	0.1567	0.1662	0.1762	0.1686	0.1440	0.1324	0.1317	0.1293
	NO2	g/vehicle/km	0.0223	0.0211	0.0213	0.0221	0.0223	0.0280	0.0286	0.0272	0.0398	0.0375	0.0332	0.0320	0.0292	0.0282	0.0292	0.0306	0.0313	0.0335	0.0359	0.0342	0.0283	0.0250	0.0245	0.0242
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0018***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0029***	***0.0056***	***0.0100***	***0.0092***	***0.0076***	***0.0070***	***0.0045***	***0.0041***	***0.0045***	***0.0049***	***0.0052***	***0.0060***	***0.0067***	***0.0061***	***0.0043***	***0.0032***	***0.0030***	***0.0026***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.22E-03	8.39E-04	5.83E-04	4.54E-04	3.92E-04	8.44E-04	1.92E-03	3.74E-03	6.70E-03	6.15E-03	5.05E-03	4.70E-03	2.99E-03	2.74E-03	2.97E-03	3.24E-03	3.47E-03	3.97E-03	4.45E-03	4.09E-03	2.87E-03	2.16E-03	2.01E-03	1.73E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.11E-04	4.19E-04	2.92E-04	2.27E-04	1.96E-04	4.22E-04	9.58E-04	1.87E-03	3.35E-03	3.07E-03	2.52E-03	2.35E-03	1.49E-03	1.37E-03	1.49E-03	1.62E-03	1.74E-03	1.99E-03	2.23E-03	2.05E-03	1.43E-03	1.08E-03	1.00E-03	8.67E-04
	Emission in each Box of 1st jet	g/s	1.22E-04	8.39E-05	5.83E-05	4.54E-05	3.92E-05	8.44E-05	1.92E-04	3.74E-04	6.70E-04	6.15E-04	5.05E-04	4.70E-04	2.99E-04	2.74E-04	2.97E-04	3.24E-04	3.47E-04	3.97E-04	4.45E-04	4.09E-04	2.87E-04	2.16E-04	2.01E-04	1.73E-04
	Emission in each Box of 2nd jet	g/s	6.11E-05	4.19E-05	2.92E-05	2.27E-05	1.96E-05	4.22E-05	9.58E-05	1.87E-04	3.35E-04	3.07E-04	2.52E-04	2.35E-04	1.49E-04	1.37E-04	1.49E-04	1.62E-04	1.74E-04	1.99E-04	2.23E-04	2.05E-04	1.43E-04	1.08E-04	1.00E-04	8.67E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0017***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0010***	***0.0012***	***0.0014***	***0.0012***	***0.0008***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.04E-04	1.58E-04	1.09E-04	8.36E-05	7.11E-05	1.03E-04	2.25E-04	5.44E-04	1.21E-03	1.10E-03	8.97E-04	8.25E-04	5.94E-04	5.38E-04	5.91E-04	6.50E-04	6.94E-04	8.00E-04	9.07E-04	8.31E-04	5.63E-04	4.06E-04	3.74E-04	3.24E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.02E-04	7.91E-05	5.47E-05	4.18E-05	3.55E-05	5.15E-05	1.12E-04	2.72E-04	6.03E-04	5.52E-04	4.48E-04	4.12E-04	2.97E-04	2.69E-04	2.96E-04	3.25E-04	3.47E-04	4.00E-04	4.54E-04	4.15E-04	2.82E-04	2.03E-04	1.87E-04	1.62E-04
	Emission in each Box of 1st jet	g/s	2.04E-05	1.58E-05	1.09E-05	8.36E-06	7.11E-06	1.03E-05	2.25E-05	5.44E-05	1.21E-04	1.10E-04	8.97E-05	8.25E-05	5.94E-05	5.38E-05	5.91E-05	6.50E-05	6.94E-05	8.00E-05	9.07E-05	8.31E-05	5.63E-05	4.06E-05	3.74E-05	3.24E-05
	Emission in each Box of 2nd jet	g/s	1.02E-05	7.91E-06	5.47E-06	4.18E-06	3.55E-06	5.15E-06	1.12E-05	2.72E-05	6.03E-05	5.52E-05	4.48E-05	4.12E-05	2.97E-05	2.69E-05	2.96E-05	3.25E-05	3.47E-05	4.00E-05	4.54E-05	4.15E-05	2.82E-05	2.03E-05	1.87E-05	1.62E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1219	0.1035	0.1064	0.1121	0.1155	0.2184	0.2347	0.1861	0.2195	0.2085	0.1893	0.1823	0.1445	0.1418	0.1436	0.1492	0.1537	0.1607	0.1680	0.1585	0.1340	0.1230	0.1196	0.1150
	NO2	g/vehicle/km	0.0206	0.0198	0.0202	0.0209	0.0212	0.0268	0.0277	0.0272	0.0397	0.0376	0.0338	0.0322	0.0289	0.0280	0.0287	0.0300	0.0308	0.0326	0.0345	0.0325	0.0266	0.0234	0.0226	0.0218
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0006***	***0.0012***	***0.0028***	***0.0056***	***0.0100***	***0.0092***	***0.0077***	***0.0070***	***0.0044***	***0.0041***	***0.0044***	***0.0048***	***0.0051***	***0.0058***	***0.0064***	***0.0058***	***0.0040***	***0.0030***	***0.0027***	***0.0023***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.12E-03	7.77E-04	5.46E-04	4.24E-04	3.67E-04	8.01E-04	1.85E-03	3.73E-03	6.65E-03	6.13E-03	5.11E-03	4.70E-03	2.94E-03	2.71E-03	2.90E-03	3.17E-03	3.41E-03	3.84E-03	4.24E-03	3.85E-03	2.67E-03	2.00E-03	1.82E-03	1.54E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.59E-04	3.88E-04	2.73E-04	2.12E-04	1.84E-04	4.01E-04	9.24E-04	1.86E-03	3.33E-03	3.06E-03	2.55E-03	2.35E-03	1.47E-03	1.35E-03	1.45E-03	1.59E-03	1.70E-03	1.92E-03	2.12E-03	1.92E-03	1.33E-03	1.00E-03	9.12E-04	7.72E-04
	Emission in each Box of 1st jet	g/s	1.12E-04	7.77E-05	5.46E-05	4.24E-05	3.67E-05	8.01E-05	1.85E-04	3.73E-04	6.65E-04	6.13E-04	5.11E-04	4.70E-04	2.94E-04	2.71E-04	2.90E-04	3.17E-04	3.41E-04	3.84E-04	4.24E-04	3.85E-04	2.67E-04	2.00E-04	1.82E-04	1.54E-04
	Emission in each Box of 2nd jet	g/s	5.59E-05	3.88E-05	2.73E-05	2.12E-05	1.84E-05	4.01E-05	9.24E-05	1.86E-04	3.33E-04	3.06E-04	2.55E-04	2.35E-04	1.47E-04	1.35E-04	1.45E-04	1.59E-04	1.70E-04	1.92E-04	2.12E-04	1.92E-04	1.33E-04	1.00E-04	9.12E-05	7.72E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0018***	***0.0017***	***0.0014***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0010***	***0.0012***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.89E-04	1.49E-04	1.04E-04	7.92E-05	6.74E-05	9.82E-05	2.18E-04	5.46E-04	1.20E-03	1.11E-03	9.11E-04	8.29E-04	5.88E-04	5.34E-04	5.81E-04	6.38E-04	6.83E-04	7.80E-04	8.72E-04	7.89E-04	5.30E-04	3.81E-04	3.44E-04	2.93E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.47E-05	7.44E-05	5.19E-05	3.96E-05	3.37E-05	4.91E-05	1.09E-04	2.73E-04	6.01E-04	5.53E-04	4.55E-04	4.14E-04	2.94E-04	2.67E-04	2.91E-04	3.19E-04	3.42E-04	3.90E-04	4.36E-04	3.95E-04	2.65E-04	1.91E-04	1.72E-04	1.46E-04
	Emission in each Box of 1st jet	g/s	1.89E-05	1.49E-05	1.04E-05	7.92E-06	6.74E-06	9.82E-06	2.18E-05	5.46E-05	1.20E-04	1.11E-04	9.11E-05	8.29E-05	5.88E-05	5.34E-05	5.81E-05	6.38E-05	6.83E-05	7.80E-05	8.72E-05	7.89E-05	5.30E-05	3.81E-05	3.44E-05	2.93E-05
	Emission in each Box of 2nd jet	g/s	9.47E-06	7.44E-06	5.19E-06	3.96E-06	3.37E-06	4.91E-06	1.09E-05	2.73E-05	6.01E-05	5.53E-05	4.55E-05	4.14E-05	2.94E-05	2.67E-05	2.91E-05	3.19E-05	3.42E-05	3.90E-05	4.36E-05	3.95E-05	2.65E-05	1.91E-05	1.72E-05	1.46E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1173	0.0962	0.0973	0.1012	0.1039	0.1962	0.2078	0.1591	0.1930	0.1833	0.1685	0.1645	0.1324	0.1269	0.1320	0.1357	0.1375	0.1432	0.1503	0.1438	0.1227	0.1153	0.1131	0.1098
	NO2	g/vehicle/km	0.0199	0.0186	0.0187	0.0191	0.0193	0.0243	0.0247	0.0236	0.0354	0.0334	0.0304	0.0293	0.0267	0.0253	0.0266	0.0275	0.0278	0.0293	0.0312	0.0297	0.0246	0.0220	0.0214	0.0209
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0007***	***0.0006***	***0.0005***	***0.0011***	***0.0025***	***0.0048***	***0.0088***	***0.0081***	***0.0068***	***0.0064***	***0.0040***	***0.0036***	***0.0040***	***0.0043***	***0.0046***	***0.0051***	***0.0057***	***0.0052***	***0.0037***	***0.0028***	***0.0026***	***0.0022***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.08E-03	7.22E-04	5.00E-04	3.83E-04	3.30E-04	7.20E-04	1.64E-03	3.19E-03	5.85E-03	5.39E-03	4.55E-03	4.24E-03	2.70E-03	2.42E-03	2.67E-03	2.88E-03	3.05E-03	3.42E-03	3.80E-03	3.49E-03	2.44E-03	1.88E-03	1.72E-03	1.47E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.38E-04	3.61E-04	2.50E-04	1.92E-04	1.65E-04	3.60E-04	8.18E-04	1.60E-03	2.93E-03	2.69E-03	2.27E-03	2.12E-03	1.35E-03	1.21E-03	1.34E-03	1.44E-03	1.52E-03	1.71E-03	1.90E-03	1.75E-03	1.22E-03	9.38E-04	8.62E-04	7.37E-04
	Emission in each Box of 1st jet	g/s	1.08E-04	7.22E-05	5.00E-05	3.83E-05	3.30E-05	7.20E-05	1.64E-04	3.19E-04	5.85E-04	5.39E-04	4.55E-04	4.24E-04	2.70E-04	2.42E-04	2.67E-04	2.88E-04	3.05E-04	3.42E-04	3.80E-04	3.49E-04	2.44E-04	1.88E-04	1.72E-04	1.47E-04
	Emission in each Box of 2nd jet	g/s	5.38E-05	3.61E-05	2.50E-05	1.92E-05	1.65E-05	3.60E-05	8.18E-05	1.60E-04	2.93E-04	2.69E-04	2.27E-04	2.12E-04	1.35E-04	1.21E-04	1.34E-04	1.44E-04	1.52E-04	1.71E-04	1.90E-04	1.75E-04	1.22E-04	9.38E-05	8.62E-05	7.37E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0015***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.82E-04	1.39E-04	9.61E-05	7.24E-05	6.15E-05	8.90E-05	1.95E-04	4.74E-04	1.07E-03	9.83E-04	8.20E-04	7.54E-04	5.43E-04	4.83E-04	5.38E-04	5.84E-04	6.17E-04	7.00E-04	7.88E-04	7.22E-04	4.89E-04	3.59E-04	3.27E-04	2.80E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.12E-05	6.97E-05	4.80E-05	3.62E-05	3.08E-05	4.45E-05	9.73E-05	2.37E-04	5.36E-04	4.91E-04	4.10E-04	3.77E-04	2.72E-04	2.41E-04	2.69E-04	2.92E-04	3.09E-04	3.50E-04	3.94E-04	3.61E-04	2.45E-04	1.79E-04	1.63E-04	1.40E-04
	Emission in each Box of 1st jet	g/s	1.82E-05	1.39E-05	9.61E-06	7.24E-06	6.15E-06	8.90E-06	1.95E-05	4.74E-05	1.07E-04	9.83E-05	8.20E-05	7.54E-05	5.43E-05	4.83E-05	5.38E-05	5.84E-05	6.17E-05	7.00E-05	7.88E-05	7.22E-05	4.89E-05	3.59E-05	3.27E-05	2.80E-05
	Emission in each Box of 2nd jet	g/s	9.12E-06	6.97E-06	4.80E-06	3.62E-06	3.08E-06	4.45E-06	9.73E-06	2.37E-05	5.36E-05	4.91E-05	4.10E-05	3.77E-05	2.72E-05	2.41E-05	2.69E-05	2.92E-05	3.09E-05	3.50E-05	3.94E-05	3.61E-05	2.45E-05	1.79E-05	1.63E-05	1.40E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1065	0.0908	0.0946	0.0976	0.0998	0.1872	0.1981	0.1567	0.1924	0.1805	0.1654	0.1585	0.1276	0.1272	0.1306	0.1354	0.1365	0.1451	0.1561	0.1461	0.1243	0.1155	0.1120	0.1113
	NO2	g/vehicle/km	0.0183	0.0177	0.0183	0.0185	0.0187	0.0233	0.0237	0.0232	0.0352	0.0330	0.0299	0.0282	0.0258	0.0253	0.0263	0.0274	0.0277	0.0297	0.0323	0.0302	0.0249	0.0221	0.0212	0.0212
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0006***	***0.0005***	***0.0010***	***0.0023***	***0.0047***	***0.0087***	***0.0080***	***0.0067***	***0.0061***	***0.0039***	***0.0036***	***0.0040***	***0.0043***	***0.0045***	***0.0052***	***0.0059***	***0.0053***	***0.0037***	***0.0028***	***0.0026***	***0.0022***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.77E-04	6.82E-04	4.86E-04	3.69E-04	3.17E-04	6.87E-04	1.56E-03	3.14E-03	5.83E-03	5.30E-03	4.46E-03	4.09E-03	2.60E-03	2.43E-03	2.64E-03	2.88E-03	3.03E-03	3.47E-03	3.94E-03	3.55E-03	2.47E-03	1.88E-03	1.71E-03	1.49E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.88E-04	3.41E-04	2.43E-04	1.85E-04	1.59E-04	3.43E-04	7.80E-04	1.57E-03	2.92E-03	2.65E-03	2.23E-03	2.04E-03	1.30E-03	1.21E-03	1.32E-03	1.44E-03	1.51E-03	1.73E-03	1.97E-03	1.77E-03	1.24E-03	9.40E-04	8.54E-04	7.46E-04
	Emission in each Box of 1st jet	g/s	9.77E-05	6.82E-05	4.86E-05	3.69E-05	3.17E-05	6.87E-05	1.56E-04	3.14E-04	5.83E-04	5.30E-04	4.46E-04	4.09E-04	2.60E-04	2.43E-04	2.64E-04	2.88E-04	3.03E-04	3.47E-04	3.94E-04	3.55E-04	2.47E-04	1.88E-04	1.71E-04	1.49E-04
	Emission in each Box of 2nd jet	g/s	4.88E-05	3.41E-05	2.43E-05	1.85E-05	1.59E-05	3.43E-05	7.80E-05	1.57E-04	2.92E-04	2.65E-04	2.23E-04	2.04E-04	1.30E-04	1.21E-04	1.32E-04	1.44E-04	1.51E-04	1.73E-04	1.97E-04	1.77E-04	1.24E-04	9.40E-05	8.54E-05	7.46E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0015***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.68E-04	1.33E-04	9.37E-05	7.02E-05	5.94E-05	8.53E-05	1.86E-04	4.66E-04	1.07E-03	9.69E-04	8.06E-04	7.28E-04	5.25E-04	4.84E-04	5.33E-04	5.83E-04	6.13E-04	7.10E-04	8.15E-04	7.34E-04	4.95E-04	3.60E-04	3.24E-04	2.84E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.38E-05	6.64E-05	4.69E-05	3.51E-05	2.97E-05	4.27E-05	9.32E-05	2.33E-04	5.33E-04	4.85E-04	4.03E-04	3.64E-04	2.63E-04	2.42E-04	2.66E-04	2.92E-04	3.07E-04	3.55E-04	4.08E-04	3.67E-04	2.48E-04	1.80E-04	1.62E-04	1.42E-04
	Emission in each Box of 1st jet	g/s	1.68E-05	1.33E-05	9.37E-06	7.02E-06	5.94E-06	8.53E-06	1.86E-05	4.66E-05	1.07E-04	9.69E-05	8.06E-05	7.28E-05	5.25E-05	4.84E-05	5.33E-05	5.83E-05	6.13E-05	7.10E-05	8.15E-05	7.34E-05	4.95E-05	3.60E-05	3.24E-05	2.84E-05
	Emission in each Box of 2nd jet	g/s	8.38E-06	6.64E-06	4.69E-06	3.51E-06	2.97E-06	4.27E-06	9.32E-06	2.33E-05	5.33E-05	4.85E-05	4.03E-05	3.64E-05	2.63E-05	2.42E-05	2.66E-05	2.92E-05	3.07E-05	3.55E-05	4.08E-05	3.67E-05	2.48E-05	1.80E-05	1.62E-05	1.42E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1042	0.0876	0.0906	0.0933	0.0940	0.1824	0.1902	0.1494	0.1821	0.1806	0.1681	0.1664	0.1324	0.1293	0.1333	0.1392	0.1353	0.1432	0.1509	0.1403	0.1161	0.1079	0.1048	0.1010
	NO2	g/vehicle/km	0.0178	0.0171	0.0175	0.0178	0.0176	0.0226	0.0227	0.0223	0.0334	0.0330	0.0303	0.0296	0.0267	0.0257	0.0268	0.0282	0.0274	0.0293	0.0313	0.0291	0.0233	0.0208	0.0200	0.0194
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0010***	***0.0022***	***0.0045***	***0.0083***	***0.0080***	***0.0068***	***0.0064***	***0.0040***	***0.0037***	***0.0040***	***0.0044***	***0.0045***	***0.0051***	***0.0057***	***0.0051***	***0.0035***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.55E-04	6.58E-04	4.65E-04	3.53E-04	2.99E-04	6.69E-04	1.50E-03	2.99E-03	5.52E-03	5.31E-03	4.54E-03	4.29E-03	2.70E-03	2.47E-03	2.70E-03	2.96E-03	3.00E-03	3.42E-03	3.81E-03	3.40E-03	2.31E-03	1.76E-03	1.60E-03	1.35E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.78E-04	3.29E-04	2.33E-04	1.77E-04	1.49E-04	3.35E-04	7.49E-04	1.50E-03	2.76E-03	2.65E-03	2.27E-03	2.15E-03	1.35E-03	1.23E-03	1.35E-03	1.48E-03	1.50E-03	1.71E-03	1.91E-03	1.70E-03	1.16E-03	8.78E-04	7.99E-04	6.77E-04
	Emission in each Box of 1st jet	g/s	9.55E-05	6.58E-05	4.65E-05	3.53E-05	2.99E-05	6.69E-05	1.50E-04	2.99E-04	5.52E-04	5.31E-04	4.54E-04	4.29E-04	2.70E-04	2.47E-04	2.70E-04	2.96E-04	3.00E-04	3.42E-04	3.81E-04	3.40E-04	2.31E-04	1.76E-04	1.60E-04	1.35E-04
	Emission in each Box of 2nd jet	g/s	4.78E-05	3.29E-05	2.33E-05	1.77E-05	1.49E-05	3.35E-05	7.49E-05	1.50E-04	2.76E-04	2.65E-04	2.27E-04	2.15E-04	1.35E-04	1.23E-04	1.35E-04	1.48E-04	1.50E-04	1.71E-04	1.91E-04	1.70E-04	1.16E-04	8.78E-05	7.99E-05	6.77E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0015***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0010***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.63E-04	1.28E-04	8.99E-05	6.73E-05	5.61E-05	8.30E-05	1.79E-04	4.46E-04	1.01E-03	9.69E-04	8.18E-04	7.63E-04	5.43E-04	4.91E-04	5.43E-04	5.99E-04	6.08E-04	7.00E-04	7.90E-04	7.05E-04	4.64E-04	3.38E-04	3.05E-04	2.60E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.17E-05	6.41E-05	4.50E-05	3.36E-05	2.81E-05	4.15E-05	8.95E-05	2.23E-04	5.07E-04	4.85E-04	4.09E-04	3.81E-04	2.72E-04	2.45E-04	2.71E-04	3.00E-04	3.04E-04	3.50E-04	3.95E-04	3.53E-04	2.32E-04	1.69E-04	1.53E-04	1.30E-04
	Emission in each Box of 1st jet	g/s	1.63E-05	1.28E-05	8.99E-06	6.73E-06	5.61E-06	8.30E-06	1.79E-05	4.46E-05	1.01E-04	9.69E-05	8.18E-05	7.63E-05	5.43E-05	4.91E-05	5.43E-05	5.99E-05	6.08E-05	7.00E-05	7.90E-05	7.05E-05	4.64E-05	3.38E-05	3.05E-05	2.60E-05
	Emission in each Box of 2nd jet	g/s	8.17E-06	6.41E-06	4.50E-06	3.36E-06	2.81E-06	4.15E-06	8.95E-06	2.23E-05	5.07E-05	4.85E-05	4.09E-05	3.81E-05	2.72E-05	2.45E-05	2.71E-05	3.00E-05	3.04E-05	3.50E-05	3.95E-05	3.53E-05	2.32E-05	1.69E-05	1.53E-05	1.30E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1103	0.0900	0.0938	0.0984	0.0998	0.1864	0.1973	0.1487	0.1839	0.1769	0.1643	0.1591	0.1287	0.1290	0.1335	0.1373	0.1446	0.1501	0.1596	0.1485	0.1217	0.1095	0.1088	0.1065
	NO2	g/vehicle/km	0.0188	0.0176	0.0181	0.0187	0.0187	0.0232	0.0236	0.0221	0.0337	0.0324	0.0297	0.0284	0.0260	0.0257	0.0269	0.0278	0.0292	0.0306	0.0329	0.0307	0.0244	0.0211	0.0207	0.0203
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0006***	***0.0005***	***0.0010***	***0.0023***	***0.0045***	***0.0084***	***0.0078***	***0.0066***	***0.0062***	***0.0039***	***0.0037***	***0.0040***	***0.0044***	***0.0048***	***0.0054***	***0.0060***	***0.0054***	***0.0036***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.01E-03	6.76E-04	4.81E-04	3.73E-04	3.17E-04	6.84E-04	1.55E-03	2.98E-03	5.58E-03	5.20E-03	4.43E-03	4.10E-03	2.62E-03	2.47E-03	2.70E-03	2.92E-03	3.21E-03	3.59E-03	4.03E-03	3.60E-03	2.42E-03	1.78E-03	1.66E-03	1.43E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.06E-04	3.38E-04	2.41E-04	1.86E-04	1.59E-04	3.42E-04	7.77E-04	1.49E-03	2.79E-03	2.60E-03	2.22E-03	2.05E-03	1.31E-03	1.23E-03	1.35E-03	1.46E-03	1.60E-03	1.79E-03	2.02E-03	1.80E-03	1.21E-03	8.91E-04	8.30E-04	7.14E-04
	Emission in each Box of 1st jet	g/s	1.01E-04	6.76E-05	4.81E-05	3.73E-05	3.17E-05	6.84E-05	1.55E-04	2.98E-04	5.58E-04	5.20E-04	4.43E-04	4.10E-04	2.62E-04	2.47E-04	2.70E-04	2.92E-04	3.21E-04	3.59E-04	4.03E-04	3.60E-04	2.42E-04	1.78E-04	1.66E-04	1.43E-04
	Emission in each Box of 2nd jet	g/s	5.06E-05	3.38E-05	2.41E-05	1.86E-05	1.59E-05	3.42E-05	7.77E-05	1.49E-04	2.79E-04	2.60E-04	2.22E-04	2.05E-04	1.31E-04	1.23E-04	1.35E-04	1.46E-04	1.60E-04	1.79E-04	2.02E-04	1.80E-04	1.21E-04	8.91E-05	8.30E-05	7.14E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.73E-04	1.32E-04	9.31E-05	7.07E-05	5.94E-05	8.50E-05	1.86E-04	4.44E-04	1.02E-03	9.51E-04	8.01E-04	7.32E-04	5.29E-04	4.90E-04	5.43E-04	5.91E-04	6.47E-04	7.32E-04	8.32E-04	7.45E-04	4.86E-04	3.43E-04	3.16E-04	2.73E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.64E-05	6.59E-05	4.65E-05	3.54E-05	2.97E-05	4.25E-05	9.28E-05	2.22E-04	5.11E-04	4.76E-04	4.00E-04	3.66E-04	2.65E-04	2.45E-04	2.72E-04	2.95E-04	3.24E-04	3.66E-04	4.16E-04	3.72E-04	2.43E-04	1.72E-04	1.58E-04	1.36E-04
	Emission in each Box of 1st jet	g/s	1.73E-05	1.32E-05	9.31E-06	7.07E-06	5.94E-06	8.50E-06	1.86E-05	4.44E-05	1.02E-04	9.51E-05	8.01E-05	7.32E-05	5.29E-05	4.90E-05	5.43E-05	5.91E-05	6.47E-05	7.32E-05	8.32E-05	7.45E-05	4.86E-05	3.43E-05	3.16E-05	2.73E-05
	Emission in each Box of 2nd jet	g/s	8.64E-06	6.59E-06	4.65E-06	3.54E-06	2.97E-06	4.25E-06	9.28E-06	2.22E-05	5.11E-05	4.76E-05	4.00E-05	3.66E-05	2.65E-05	2.45E-05	2.72E-05	2.95E-05	3.24E-05	3.66E-05	4.16E-05	3.72E-05	2.43E-05	1.72E-05	1.58E-05	1.36E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 104C01-104C20
Enclosure Involved: 104P3
Road Located: 089
Vehicle EF Adopted: 104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1095	0.0922	0.0925	0.0943	0.0992	0.1815	0.1930	0.1462	0.1759	0.1690	0.1629	0.1519	0.1266	0.1254	0.1325	0.1301	0.1299	0.1420	0.1523	0.1417	0.1216	0.1106	0.1086	0.1053
	NO2	g/vehicle/km	0.0187	0.0179	0.0179	0.0179	0.0186	0.0225	0.0230	0.0218	0.0324	0.0310	0.0294	0.0271	0.0256	0.0250	0.0267	0.0264	0.0264	0.0291	0.0315	0.0293	0.0244	0.0213	0.0207	0.0201
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0010***	***0.0023***	***0.0044***	***0.0080***	***0.0074***	***0.0066***	***0.0059***	***0.0039***	***0.0036***	***0.0040***	***0.0041***	***0.0043***	***0.0051***	***0.0058***	***0.0052***	***0.0036***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.00E-03	6.92E-04	4.75E-04	3.57E-04	3.16E-04	6.66E-04	1.52E-03	2.93E-03	5.33E-03	4.97E-03	4.39E-03	3.92E-03	2.58E-03	2.40E-03	2.68E-03	2.77E-03	2.88E-03	3.39E-03	3.85E-03	3.44E-03	2.42E-03	1.80E-03	1.66E-03	1.41E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.02E-04	3.46E-04	2.37E-04	1.79E-04	1.58E-04	3.33E-04	7.60E-04	1.47E-03	2.67E-03	2.48E-03	2.20E-03	1.96E-03	1.29E-03	1.20E-03	1.34E-03	1.38E-03	1.44E-03	1.70E-03	1.92E-03	1.72E-03	1.21E-03	9.00E-04	8.28E-04	7.06E-04
	Emission in each Box of 1st jet	g/s	1.00E-04	6.92E-05	4.75E-05	3.57E-05	3.16E-05	6.66E-05	1.52E-04	2.93E-04	5.33E-04	4.97E-04	4.39E-04	3.92E-04	2.58E-04	2.40E-04	2.68E-04	2.77E-04	2.88E-04	3.39E-04	3.85E-04	3.44E-04	2.42E-04	1.80E-04	1.66E-04	1.41E-04
	Emission in each Box of 2nd jet	g/s	5.02E-05	3.46E-05	2.37E-05	1.79E-05	1.58E-05	3.33E-05	7.60E-05	1.47E-04	2.67E-04	2.48E-04	2.20E-04	1.96E-04	1.29E-04	1.20E-04	1.34E-04	1.38E-04	1.44E-04	1.70E-04	1.92E-04	1.72E-04	1.21E-04	9.00E-05	8.28E-05	7.06E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0012***	***0.0010***	***0.0008***	***0.0007***	***0.0008***	***0.0008***	***0.0009***	***0.0010***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.72E-04	1.35E-04	9.19E-05	6.78E-05	5.91E-05	8.27E-05	1.81E-04	4.37E-04	9.82E-04	9.12E-04	7.94E-04	7.00E-04	5.21E-04	4.77E-04	5.40E-04	5.62E-04	5.85E-04	6.94E-04	7.97E-04	7.12E-04	4.85E-04	3.46E-04	3.15E-04	2.70E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.58E-05	6.73E-05	4.59E-05	3.39E-05	2.95E-05	4.14E-05	9.07E-05	2.18E-04	4.91E-04	4.56E-04	3.97E-04	3.50E-04	2.60E-04	2.39E-04	2.70E-04	2.81E-04	2.93E-04	3.47E-04	3.98E-04	3.56E-04	2.43E-04	1.73E-04	1.57E-04	1.35E-04
	Emission in each Box of 1st jet	g/s	1.72E-05	1.35E-05	9.19E-06	6.78E-06	5.91E-06	8.27E-06	1.81E-05	4.37E-05	9.82E-05	9.12E-05	7.94E-05	7.00E-05	5.21E-05	4.77E-05	5.40E-05	5.62E-05	5.85E-05	6.94E-05	7.97E-05	7.12E-05	4.85E-05	3.46E-05	3.15E-05	2.70E-05
	Emission in each Box of 2nd jet	g/s	8.58E-06	6.73E-06	4.59E-06	3.39E-06	2.95E-06	4.14E-06	9.07E-06	2.18E-05	4.91E-05	4.56E-05	3.97E-05	3.50E-05	2.60E-05	2.39E-05	2.70E-05	2.81E-05	2.93E-05	3.47E-05	3.98E-05	3.56E-05	2.43E-05	1.73E-05	1.57E-05	1.35E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section: 104C01-104C20
Enclosure Involvec: 104P3
Road Located: 089
Vehicle EF Adopte: 104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1254	0.1072	0.1081	0.1121	0.1156	0.2198	0.2312	0.1757	0.2107	0.1999	0.1827	0.1787	0.1452	0.1406	0.1432	0.1504	0.1505	0.1600	0.1716	0.1609	0.1375	0.1251	0.1240	0.1225
	NO2	g/vehicle/km	0.0211	0.0204	0.0205	0.0209	0.0212	0.0269	0.0273	0.0258	0.0382	0.0362	0.0327	0.0315	0.0290	0.0277	0.0286	0.0302	0.0302	0.0324	0.0351	0.0330	0.0272	0.0237	0.0232	0.0230
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0006***	***0.0012***	***0.0027***	***0.0053***	***0.0096***	***0.0088***	***0.0074***	***0.0069***	***0.0044***	***0.0040***	***0.0043***	***0.0048***	***0.0050***	***0.0057***	***0.0065***	***0.0059***	***0.0041***	***0.0031***	***0.0028***	***0.0025***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.15E-03	8.05E-04	5.55E-04	4.25E-04	3.68E-04	8.07E-04	1.82E-03	3.52E-03	6.39E-03	5.87E-03	4.93E-03	4.61E-03	2.96E-03	2.69E-03	2.90E-03	3.20E-03	3.34E-03	3.82E-03	4.34E-03	3.91E-03	2.74E-03	2.04E-03	1.89E-03	1.64E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.75E-04	4.02E-04	2.78E-04	2.12E-04	1.84E-04	4.03E-04	9.11E-04	1.76E-03	3.19E-03	2.94E-03	2.47E-03	2.30E-03	1.48E-03	1.34E-03	1.45E-03	1.60E-03	1.67E-03	1.91E-03	2.17E-03	1.95E-03	1.37E-03	1.02E-03	9.45E-04	8.22E-04
	Emission in each Box of 1st jet	g/s	1.15E-04	8.05E-05	5.55E-05	4.25E-05	3.68E-05	8.07E-05	1.82E-04	3.52E-04	6.39E-04	5.87E-04	4.93E-04	4.61E-04	2.96E-04	2.69E-04	2.90E-04	3.20E-04	3.34E-04	3.82E-04	4.34E-04	3.91E-04	2.74E-04	2.04E-04	1.89E-04	1.64E-04
	Emission in each Box of 2nd jet	g/s	5.75E-05	4.02E-05	2.78E-05	2.12E-05	1.84E-05	4.03E-05	9.11E-05	1.76E-04	3.19E-04	2.94E-04	2.47E-04	2.30E-04	1.48E-04	1.34E-04	1.45E-04	1.60E-04	1.67E-04	1.91E-04	2.17E-04	1.95E-04	1.37E-04	1.02E-04	9.45E-05	8.22E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0016***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0010***	***0.0012***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.94E-04	1.53E-04	1.05E-04	7.91E-05	6.73E-05	9.86E-05	2.15E-04	5.17E-04	1.16E-03	1.06E-03	8.82E-04	8.13E-04	5.90E-04	5.29E-04	5.79E-04	6.41E-04	6.69E-04	7.75E-04	8.87E-04	8.00E-04	5.41E-04	3.86E-04	3.54E-04	3.09E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.68E-05	7.65E-05	5.26E-05	3.95E-05	3.36E-05	4.93E-05	1.07E-04	2.59E-04	5.78E-04	5.32E-04	4.41E-04	4.07E-04	2.95E-04	2.65E-04	2.90E-04	3.21E-04	3.35E-04	3.88E-04	4.43E-04	4.00E-04	2.71E-04	1.93E-04	1.77E-04	1.54E-04
	Emission in each Box of 1st jet	g/s	1.94E-05	1.53E-05	1.05E-05	7.91E-06	6.73E-06	9.86E-06	2.15E-05	5.17E-05	1.16E-04	1.06E-04	8.82E-05	8.13E-05	5.90E-05	5.29E-05	5.79E-05	6.41E-05	6.69E-05	7.75E-05	8.87E-05	8.00E-05	5.41E-05	3.86E-05	3.54E-05	3.09E-05
	Emission in each Box of 2nd jet	g/s	9.68E-06	7.65E-06	5.26E-06	3.95E-06	3.36E-06	4.93E-06	1.07E-05	2.59E-05	5.78E-05	5.32E-05	4.41E-05	4.07E-05	2.95E-05	2.65E-05	2.90E-05	3.21E-05	3.35E-05	3.88E-05	4.43E-05	4.00E-05	2.71E-05	1.93E-05	1.77E-05	1.54E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1378	0.1155	0.1185	0.1235	0.1269	0.2384	0.2534	0.1906	0.2287	0.2162	0.1985	0.1913	0.1564	0.1530	0.1564	0.1614	0.1621	0.1712	0.1834	0.1752	0.1478	0.1373	0.1352	0.1330
	NO2	g/vehicle/km	0.0229	0.0218	0.0221	0.0226	0.0229	0.0290	0.0297	0.0278	0.0410	0.0388	0.0351	0.0334	0.0308	0.0298	0.0309	0.0321	0.0322	0.0344	0.0372	0.0355	0.0290	0.0257	0.0251	0.0247
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0019***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0030***	***0.0057***	***0.0104***	***0.0095***	***0.0080***	***0.0074***	***0.0048***	***0.0044***	***0.0047***	***0.0051***	***0.0054***	***0.0061***	***0.0069***	***0.0064***	***0.0044***	***0.0034***	***0.0031***	***0.0027***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.26E-03	8.67E-04	6.08E-04	4.68E-04	4.04E-04	8.75E-04	2.00E-03	3.82E-03	6.93E-03	6.35E-03	5.36E-03	4.93E-03	3.19E-03	2.92E-03	3.16E-03	3.43E-03	3.59E-03	4.09E-03	4.63E-03	4.25E-03	2.94E-03	2.23E-03	2.06E-03	1.78E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.32E-04	4.33E-04	3.04E-04	2.34E-04	2.02E-04	4.37E-04	9.98E-04	1.91E-03	3.47E-03	3.18E-03	2.68E-03	2.47E-03	1.59E-03	1.46E-03	1.58E-03	1.72E-03	1.80E-03	2.05E-03	2.32E-03	2.13E-03	1.47E-03	1.12E-03	1.03E-03	8.92E-04
	Emission in each Box of 1st jet	g/s	1.26E-04	8.67E-05	6.08E-05	4.68E-05	4.04E-05	8.75E-05	2.00E-04	3.82E-04	6.93E-04	6.35E-04	5.36E-04	4.93E-04	3.19E-04	2.92E-04	3.16E-04	3.43E-04	3.59E-04	4.09E-04	4.63E-04	4.25E-04	2.94E-04	2.23E-04	2.06E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	6.32E-05	4.33E-05	3.04E-05	2.34E-05	2.02E-05	4.37E-05	9.98E-05	1.91E-04	3.47E-04	3.18E-04	2.68E-04	2.47E-04	1.59E-04	1.46E-04	1.58E-04	1.72E-04	1.80E-04	2.05E-04	2.32E-04	2.13E-04	1.47E-04	1.12E-04	1.03E-04	8.92E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0019***	***0.0017***	***0.0014***	***0.0013***	***0.0009***	***0.0009***	***0.0009***	***0.0010***	***0.0011***	***0.0012***	***0.0014***	***0.0013***	***0.0009***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.10E-04	1.63E-04	1.13E-04	8.58E-05	7.29E-05	1.06E-04	2.34E-04	5.57E-04	1.24E-03	1.14E-03	9.47E-04	8.62E-04	6.28E-04	5.69E-04	6.25E-04	6.82E-04	7.14E-04	8.22E-04	9.41E-04	8.62E-04	5.77E-04	4.19E-04	3.83E-04	3.32E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.05E-04	8.17E-05	5.67E-05	4.29E-05	3.64E-05	5.31E-05	1.17E-04	2.79E-04	6.21E-04	5.70E-04	4.74E-04	4.31E-04	3.14E-04	2.84E-04	3.13E-04	3.41E-04	3.57E-04	4.11E-04	4.70E-04	4.31E-04	2.89E-04	2.09E-04	1.91E-04	1.66E-04
	Emission in each Box of 1st jet	g/s	2.10E-05	1.63E-05	1.13E-05	8.58E-06	7.29E-06	1.06E-05	2.34E-05	5.57E-05	1.24E-04	1.14E-04	9.47E-05	8.62E-05	6.28E-05	5.69E-05	6.25E-05	6.82E-05	7.14E-05	8.22E-05	9.41E-05	8.62E-05	5.77E-05	4.19E-05	3.83E-05	3.32E-05
	Emission in each Box of 2nd jet	g/s	1.05E-05	8.17E-06	5.67E-06	4.29E-06	3.64E-06	5.31E-06	1.17E-05	2.79E-05	6.21E-05	5.70E-05	4.74E-05	4.31E-05	3.14E-05	2.84E-05	3.13E-05	3.41E-05	3.57E-05	4.11E-05	4.70E-05	4.31E-05	2.89E-05	2.09E-05	1.91E-05	1.66E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1439	0.1215	0.1246	0.1301	0.1330	0.2464	0.2620	0.1985	0.2364	0.2233	0.2051	0.1990	0.1620	0.1574	0.1611	0.1667	0.1685	0.1799	0.1903	0.1817	0.1537	0.1426	0.1409	0.1390
	NO2	g/vehicle/km	0.0237	0.0225	0.0229	0.0235	0.0237	0.0297	0.0304	0.0287	0.0421	0.0397	0.0359	0.0344	0.0316	0.0304	0.0316	0.0328	0.0332	0.0357	0.0383	0.0365	0.0298	0.0265	0.0258	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0020***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0014***	***0.0031***	***0.0060***	***0.0107***	***0.0098***	***0.0083***	***0.0077***	***0.0049***	***0.0045***	***0.0049***	***0.0053***	***0.0056***	***0.0064***	***0.0072***	***0.0066***	***0.0046***	***0.0035***	***0.0032***	***0.0028***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.32E-03	9.12E-04	6.40E-04	4.93E-04	4.23E-04	9.04E-04	2.06E-03	3.98E-03	7.17E-03	6.56E-03	5.53E-03	5.13E-03	3.30E-03	3.01E-03	3.26E-03	3.54E-03	3.73E-03	4.30E-03	4.81E-03	4.41E-03	3.06E-03	2.32E-03	2.15E-03	1.86E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.60E-04	4.56E-04	3.20E-04	2.46E-04	2.12E-04	4.52E-04	1.03E-03	1.99E-03	3.58E-03	3.28E-03	2.77E-03	2.57E-03	1.65E-03	1.50E-03	1.63E-03	1.77E-03	1.87E-03	2.15E-03	2.40E-03	2.20E-03	1.53E-03	1.16E-03	1.07E-03	9.32E-04
	Emission in each Box of 1st jet	g/s	1.32E-04	9.12E-05	6.40E-05	4.93E-05	4.23E-05	9.04E-05	2.06E-04	3.98E-04	7.17E-04	6.56E-04	5.53E-04	5.13E-04	3.30E-04	3.01E-04	3.26E-04	3.54E-04	3.73E-04	4.30E-04	4.81E-04	4.41E-04	3.06E-04	2.32E-04	2.15E-04	1.86E-04
	Emission in each Box of 2nd jet	g/s	6.60E-05	4.56E-05	3.20E-05	2.46E-05	2.12E-05	4.52E-05	1.03E-04	1.99E-04	3.58E-04	3.28E-04	2.77E-04	2.57E-04	1.65E-04	1.50E-04	1.63E-04	1.77E-04	1.87E-04	2.15E-04	2.40E-04	2.20E-04	1.53E-04	1.16E-04	1.07E-04	9.32E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0019***	***0.0017***	***0.0015***	***0.0013***	***0.0010***	***0.0009***	***0.0010***	***0.0010***	***0.0011***	***0.0013***	***0.0015***	***0.0013***	***0.0009***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.17E-04	1.69E-04	1.18E-04	8.89E-05	7.53E-05	1.09E-04	2.40E-04	5.74E-04	1.28E-03	1.17E-03	9.69E-04	8.88E-04	6.44E-04	5.81E-04	6.39E-04	6.98E-04	7.36E-04	8.54E-04	9.67E-04	8.85E-04	5.93E-04	4.31E-04	3.94E-04	3.43E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.09E-04	8.46E-05	5.88E-05	4.45E-05	3.77E-05	5.46E-05	1.20E-04	2.87E-04	6.38E-04	5.83E-04	4.85E-04	4.44E-04	3.22E-04	2.90E-04	3.19E-04	3.49E-04	3.68E-04	4.27E-04	4.83E-04	4.42E-04	2.97E-04	2.15E-04	1.97E-04	1.71E-04
	Emission in each Box of 1st jet	g/s	2.17E-05	1.69E-05	1.18E-05	8.89E-06	7.53E-06	1.09E-05	2.40E-05	5.74E-05	1.28E-04	1.17E-04	9.69E-05	8.88E-05	6.44E-05	5.81E-05	6.39E-05	6.98E-05	7.36E-05	8.54E-05	9.67E-05	8.85E-05	5.93E-05	4.31E-05	3.94E-05	3.43E-05
	Emission in each Box of 2nd jet	g/s	1.09E-05	8.46E-06	5.88E-06	4.45E-06	3.77E-06	5.46E-06	1.20E-05	2.87E-05	6.38E-05	5.83E-05	4.85E-05	4.44E-05	3.22E-05	2.90E-05	3.19E-05	3.49E-05	3.68E-05	4.27E-05	4.83E-05	4.42E-05	2.97E-05	2.15E-05	1.97E-05	1.71E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1458	0.1243	0.1268	0.1327	0.1354	0.2499	0.2648	0.2020	0.2395	0.2261	0.2066	0.2019	0.1638	0.1602	0.1641	0.1698	0.1736	0.1843	0.1952	0.1856	0.1577	0.1462	0.1428	0.1399
	NO2	g/vehicle/km	0.0238	0.0228	0.0231	0.0237	0.0239	0.0300	0.0307	0.0290	0.0424	0.0401	0.0361	0.0348	0.0319	0.0307	0.0320	0.0332	0.0339	0.0364	0.0390	0.0370	0.0303	0.0270	0.0261	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0041***	***0.0073***	***0.0067***	***0.0056***	***0.0052***	***0.0029***	***0.0026***	***0.0029***	***0.0031***	***0.0033***	***0.0037***	***0.0042***	***0.0038***	***0.0027***	***0.0020***	***0.0019***	***0.0016***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.86E-04	6.19E-04	4.31E-04	3.35E-04	2.85E-04	6.31E-04	1.43E-03	2.73E-03	4.84E-03	4.44E-03	3.74E-03	3.50E-03	1.92E-03	1.76E-03	1.91E-03	2.07E-03	2.19E-03	2.50E-03	2.80E-03	2.55E-03	1.78E-03	1.36E-03	1.24E-03	1.06E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.43E-04	3.10E-04	2.15E-04	1.68E-04	1.42E-04	3.15E-04	7.15E-04	1.36E-03	2.42E-03	2.22E-03	1.87E-03	1.75E-03	9.59E-04	8.79E-04	9.54E-04	1.04E-03	1.09E-03	1.25E-03	1.40E-03	1.27E-03	8.92E-04	6.81E-04	6.20E-04	5.32E-04
	Emission in each Box of 1st jet	g/s	8.86E-05	6.19E-05	4.31E-05	3.35E-05	2.85E-05	6.31E-05	1.43E-04	2.73E-04	4.84E-04	4.44E-04	3.74E-04	3.50E-04	1.92E-04	1.76E-04	1.91E-04	2.07E-04	2.19E-04	2.50E-04	2.80E-04	2.55E-04	1.78E-04	1.36E-04	1.24E-04	1.06E-04
	Emission in each Box of 2nd jet	g/s	4.43E-05	3.10E-05	2.15E-05	1.68E-05	1.42E-05	3.15E-05	7.15E-05	1.36E-04	2.42E-04	2.22E-04	1.87E-04	1.75E-04	9.59E-05	8.79E-05	9.54E-05	1.04E-04	1.09E-04	1.25E-04	1.40E-04	1.27E-04	8.92E-05	6.81E-05	6.20E-05	5.32E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0006***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.45E-04	1.14E-04	7.86E-05	6.00E-05	5.03E-05	7.58E-05	1.66E-04	3.92E-04	8.57E-04	7.87E-04	6.54E-04	6.04E-04	3.74E-04	3.37E-04	3.72E-04	4.06E-04	4.27E-04	4.93E-04	5.59E-04	5.08E-04	3.43E-04	2.52E-04	2.26E-04	1.95E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.24E-05	5.69E-05	3.93E-05	3.00E-05	2.51E-05	3.79E-05	8.28E-05	1.96E-04	4.29E-04	3.93E-04	3.27E-04	3.02E-04	1.87E-04	1.69E-04	1.86E-04	2.03E-04	2.14E-04	2.47E-04	2.79E-04	2.54E-04	1.72E-04	1.26E-04	1.13E-04	9.74E-05
	Emission in each Box of 1st jet	g/s	1.45E-05	1.14E-05	7.86E-06	6.00E-06	5.03E-06	7.58E-06	1.66E-05	3.92E-05	8.57E-05	7.87E-05	6.54E-05	6.04E-05	3.74E-05	3.37E-05	3.72E-05	4.06E-05	4.27E-05	4.93E-05	5.59E-05	5.08E-05	3.43E-05	2.52E-05	2.26E-05	1.95E-05
	Emission in each Box of 2nd jet	g/s	7.24E-06	5.69E-06	3.93E-06	3.00E-06	2.51E-06	3.79E-06	8.28E-06	1.96E-05	4.29E-05	3.93E-05	3.27E-05	3.02E-05	1.87E-05	1.69E-05	1.86E-05	2.03E-05	2.14E-05	2.47E-05	2.79E-05	2.54E-05	1.72E-05	1.26E-05	1.13E-05	9.74E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1321	0.1119	0.1137	0.1198	0.1257	0.2359	0.2515	0.1895	0.2252	0.2156	0.1976	0.1921	0.1551	0.1496	0.1544	0.1602	0.1637	0.1718	0.1774	0.1685	0.1422	0.1322	0.1292	0.1264
	NO2	g/vehicle/km	0.0221	0.0211	0.0213	0.0220	0.0227	0.0287	0.0294	0.0276	0.0405	0.0386	0.0349	0.0335	0.0306	0.0292	0.0305	0.0318	0.0325	0.0344	0.0361	0.0342	0.0279	0.0248	0.0241	0.0236
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0038***	***0.0068***	***0.0063***	***0.0054***	***0.0050***	***0.0027***	***0.0025***	***0.0027***	***0.0029***	***0.0031***	***0.0035***	***0.0038***	***0.0035***	***0.0024***	***0.0018***	***0.0017***	***0.0014***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.02E-04	5.58E-04	3.87E-04	3.02E-04	2.65E-04	5.96E-04	1.36E-03	2.56E-03	4.55E-03	4.23E-03	3.57E-03	3.33E-03	1.82E-03	1.64E-03	1.80E-03	1.96E-03	2.06E-03	2.33E-03	2.54E-03	2.31E-03	1.61E-03	1.23E-03	1.12E-03	9.62E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.01E-04	2.79E-04	1.93E-04	1.51E-04	1.32E-04	2.98E-04	6.79E-04	1.28E-03	2.27E-03	2.12E-03	1.79E-03	1.67E-03	9.08E-04	8.21E-04	8.98E-04	9.78E-04	1.03E-03	1.16E-03	1.27E-03	1.16E-03	8.04E-04	6.16E-04	5.61E-04	4.81E-04
	Emission in each Box of 1st jet	g/s	8.02E-05	5.58E-05	3.87E-05	3.02E-05	2.65E-05	5.96E-05	1.36E-04	2.56E-04	4.55E-04	4.23E-04	3.57E-04	3.33E-04	1.82E-04	1.64E-04	1.80E-04	1.96E-04	2.06E-04	2.33E-04	2.54E-04	2.31E-04	1.61E-04	1.23E-04	1.12E-04	9.62E-05
	Emission in each Box of 2nd jet	g/s	4.01E-05	2.79E-05	1.93E-05	1.51E-05	1.32E-05	2.98E-05	6.79E-05	1.28E-04	2.27E-04	2.12E-04	1.79E-04	1.67E-04	9.08E-05	8.21E-05	8.98E-05	9.78E-05	1.03E-04	1.16E-04	1.27E-04	1.16E-04	8.04E-05	6.16E-05	5.61E-05	4.81E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0012***	***0.0011***	***0.0009***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.34E-04	1.05E-04	7.24E-05	5.55E-05	4.77E-05	7.24E-05	1.59E-04	3.73E-04	8.18E-04	7.58E-04	6.31E-04	5.81E-04	3.58E-04	3.20E-04	3.55E-04	3.88E-04	4.09E-04	4.66E-04	5.17E-04	4.70E-04	3.16E-04	2.32E-04	2.09E-04	1.80E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.70E-05	5.26E-05	3.62E-05	2.77E-05	2.39E-05	3.62E-05	7.94E-05	1.87E-04	4.09E-04	3.79E-04	3.16E-04	2.90E-04	1.79E-04	1.60E-04	1.77E-04	1.94E-04	2.04E-04	2.33E-04	2.58E-04	2.35E-04	1.58E-04	1.16E-04	1.05E-04	8.99E-05
	Emission in each Box of 1st jet	g/s	1.34E-05	1.05E-05	7.24E-06	5.55E-06	4.77E-06	7.24E-06	1.59E-05	3.73E-05	8.18E-05	7.58E-05	6.31E-05	5.81E-05	3.58E-05	3.20E-05	3.55E-05	3.88E-05	4.09E-05	4.66E-05	5.17E-05	4.70E-05	3.16E-05	2.32E-05	2.09E-05	1.80E-05
	Emission in each Box of 2nd jet	g/s	6.70E-06	5.26E-06	3.62E-06	2.77E-06	2.39E-06	3.62E-06	7.94E-06	1.87E-05	4.09E-05	3.79E-05	3.16E-05	2.90E-05	1.79E-05	1.60E-05	1.77E-05	1.94E-05	2.04E-05	2.33E-05	2.58E-05	2.35E-05	1.58E-05	1.16E-05	1.05E-05	8.99E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involved	104P4
Road Located	123
Vehicle EF Adopted	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1333	0.1117	0.1137	0.1198	0.1232	0.2301	0.2432	0.1865	0.2210	0.2091	0.1870	0.1821	0.1467	0.1435	0.1469	0.1526	0.1567	0.1662	0.1762	0.1686	0.1440	0.1324	0.1317	0.1293
	NO2	g/vehicle/km	0.0223	0.0211	0.0213	0.0221	0.0223	0.0280	0.0286	0.0272	0.0398	0.0375	0.0332	0.0320	0.0292	0.0282	0.0292	0.0306	0.0313	0.0335	0.0359	0.0342	0.0283	0.0250	0.0245	0.0242
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0038***	***0.0067***	***0.0062***	***0.0051***	***0.0047***	***0.0026***	***0.0024***	***0.0026***	***0.0028***	***0.0030***	***0.0034***	***0.0038***	***0.0035***	***0.0024***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.10E-04	5.57E-04	3.86E-04	3.03E-04	2.59E-04	5.81E-04	1.31E-03	2.52E-03	4.46E-03	4.10E-03	3.38E-03	3.16E-03	1.72E-03	1.57E-03	1.71E-03	1.86E-03	1.97E-03	2.25E-03	2.52E-03	2.31E-03	1.63E-03	1.23E-03	1.14E-03	9.84E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.05E-04	2.78E-04	1.93E-04	1.51E-04	1.30E-04	2.90E-04	6.57E-04	1.26E-03	2.23E-03	2.05E-03	1.69E-03	1.58E-03	8.59E-04	7.87E-04	8.54E-04	9.31E-04	9.86E-04	1.13E-03	1.26E-03	1.16E-03	8.14E-04	6.17E-04	5.72E-04	4.92E-04
	Emission in each Box of 1st jet	g/s	8.10E-05	5.57E-05	3.86E-05	3.03E-05	2.59E-05	5.81E-05	1.31E-04	2.52E-04	4.46E-04	4.10E-04	3.38E-04	3.16E-04	1.72E-04	1.57E-04	1.71E-04	1.86E-04	1.97E-04	2.25E-04	2.52E-04	2.31E-04	1.63E-04	1.23E-04	1.14E-04	9.84E-05
	Emission in each Box of 2nd jet	g/s	4.05E-05	2.78E-05	1.93E-05	1.51E-05	1.30E-05	2.90E-05	6.57E-05	1.26E-04	2.23E-04	2.05E-04	1.69E-04	1.58E-04	8.59E-05	7.87E-05	8.54E-05	9.31E-05	9.86E-05	1.13E-04	1.26E-04	1.16E-04	8.14E-05	6.17E-05	5.72E-05	4.92E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.35E-04	1.05E-04	7.24E-05	5.57E-05	4.70E-05	7.08E-05	1.54E-04	3.67E-04	8.04E-04	7.37E-04	6.01E-04	5.55E-04	3.42E-04	3.09E-04	3.40E-04	3.73E-04	3.94E-04	4.54E-04	5.14E-04	4.70E-04	3.20E-04	2.33E-04	2.13E-04	1.84E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.77E-05	5.25E-05	3.62E-05	2.79E-05	2.35E-05	3.54E-05	7.71E-05	1.84E-04	4.02E-04	3.68E-04	3.01E-04	2.77E-04	1.71E-04	1.55E-04	1.70E-04	1.87E-04	1.97E-04	2.27E-04	2.57E-04	2.35E-04	1.60E-04	1.16E-04	1.06E-04	9.19E-05
	Emission in each Box of 1st jet	g/s	1.35E-05	1.05E-05	7.24E-06	5.57E-06	4.70E-06	7.08E-06	1.54E-05	3.67E-05	8.04E-05	7.37E-05	6.01E-05	5.55E-05	3.42E-05	3.09E-05	3.40E-05	3.73E-05	3.94E-05	4.54E-05	5.14E-05	4.70E-05	3.20E-05	2.33E-05	2.13E-05	1.84E-05
	Emission in each Box of 2nd jet	g/s	6.77E-06	5.25E-06	3.62E-06	2.79E-06	2.35E-06	3.54E-06	7.71E-06	1.84E-05	4.02E-05	3.68E-05	3.01E-05	2.77E-05	1.71E-05	1.55E-05	1.70E-05	1.87E-05	1.97E-05	2.27E-05	2.57E-05	2.35E-05	1.60E-05	1.16E-05	1.06E-05	9.19E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section 104D01-104D20
Enclosure Involvec 104P4
Road Located 123
Vehicle EF Adopte 104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1219	0.1035	0.1064	0.1121	0.1155	0.2184	0.2347	0.1861	0.2195	0.2085	0.1893	0.1823	0.1445	0.1418	0.1436	0.1492	0.1537	0.1607	0.1680	0.1585	0.1340	0.1230	0.1196	0.1150
	NO2	g/vehicle/km	0.0206	0.0198	0.0202	0.0209	0.0212	0.0268	0.0277	0.0272	0.0397	0.0376	0.0338	0.0322	0.0289	0.0280	0.0287	0.0300	0.0308	0.0326	0.0345	0.0325	0.0266	0.0234	0.0226	0.0218
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0008***	***0.0019***	***0.0038***	***0.0066***	***0.0061***	***0.0051***	***0.0047***	***0.0025***	***0.0023***	***0.0025***	***0.0027***	***0.0029***	***0.0033***	***0.0036***	***0.0033***	***0.0023***	***0.0017***	***0.0016***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.41E-04	5.16E-04	3.62E-04	2.83E-04	2.43E-04	5.51E-04	1.27E-03	2.51E-03	4.43E-03	4.09E-03	3.43E-03	3.16E-03	1.69E-03	1.56E-03	1.67E-03	1.82E-03	1.94E-03	2.18E-03	2.41E-03	2.17E-03	1.52E-03	1.15E-03	1.04E-03	8.75E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.70E-04	2.58E-04	1.81E-04	1.41E-04	1.21E-04	2.76E-04	6.34E-04	1.26E-03	2.22E-03	2.05E-03	1.71E-03	1.58E-03	8.47E-04	7.78E-04	8.35E-04	9.10E-04	9.68E-04	1.09E-03	1.20E-03	1.09E-03	7.58E-04	5.73E-04	5.19E-04	4.38E-04
	Emission in each Box of 1st jet	g/s	7.41E-05	5.16E-05	3.62E-05	2.83E-05	2.43E-05	5.51E-05	1.27E-04	2.51E-04	4.43E-04	4.09E-04	3.43E-04	3.16E-04	1.69E-04	1.56E-04	1.67E-04	1.82E-04	1.94E-04	2.18E-04	2.41E-04	2.17E-04	1.52E-04	1.15E-04	1.04E-04	8.75E-05
	Emission in each Box of 2nd jet	g/s	3.70E-05	2.58E-05	1.81E-05	1.41E-05	1.21E-05	2.76E-05	6.34E-05	1.26E-04	2.22E-04	2.05E-04	1.71E-04	1.58E-04	8.47E-05	7.78E-05	8.35E-05	9.10E-05	9.68E-05	1.09E-04	1.20E-04	1.09E-04	7.58E-05	5.73E-05	5.19E-05	4.38E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0007***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.25E-04	9.88E-05	6.88E-05	5.28E-05	4.45E-05	6.76E-05	1.49E-04	3.68E-04	8.01E-04	7.38E-04	6.11E-04	5.57E-04	3.38E-04	3.07E-04	3.34E-04	3.66E-04	3.88E-04	4.42E-04	4.95E-04	4.46E-04	3.01E-04	2.18E-04	1.96E-04	1.66E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.27E-05	4.94E-05	3.44E-05	2.64E-05	2.23E-05	3.38E-05	7.47E-05	1.84E-04	4.00E-04	3.69E-04	3.05E-04	2.79E-04	1.69E-04	1.53E-04	1.67E-04	1.83E-04	1.94E-04	2.21E-04	2.47E-04	2.23E-04	1.51E-04	1.09E-04	9.80E-05	8.30E-05
	Emission in each Box of 1st jet	g/s	1.25E-05	9.88E-06	6.88E-06	5.28E-06	4.45E-06	6.76E-06	1.49E-05	3.68E-05	8.01E-05	7.38E-05	6.11E-05	5.57E-05	3.38E-05	3.07E-05	3.34E-05	3.66E-05	3.88E-05	4.42E-05	4.95E-05	4.46E-05	3.01E-05	2.18E-05	1.96E-05	1.66E-05
	Emission in each Box of 2nd jet	g/s	6.27E-06	4.94E-06	3.44E-06	2.64E-06	2.23E-06	3.38E-06	7.47E-06	1.84E-05	4.00E-05	3.69E-05	3.05E-05	2.79E-05	1.69E-05	1.53E-05	1.67E-05	1.83E-05	1.94E-05	2.21E-05	2.47E-05	2.23E-05	1.51E-05	1.09E-05	9.80E-06	8.30E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1173	0.0962	0.0973	0.1012	0.1039	0.1962	0.2078	0.1591	0.1930	0.1833	0.1685	0.1645	0.1324	0.1269	0.1320	0.1357	0.1375	0.1432	0.1503	0.1438	0.1227	0.1153	0.1131	0.1098
	NO2	g/vehicle/km	0.0199	0.0186	0.0187	0.0191	0.0193	0.0243	0.0247	0.0236	0.0354	0.0334	0.0304	0.0293	0.0267	0.0253	0.0266	0.0275	0.0278	0.0293	0.0312	0.0297	0.0246	0.0220	0.0214	0.0209
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0017***	***0.0032***	***0.0058***	***0.0054***	***0.0046***	***0.0043***	***0.0023***	***0.0021***	***0.0023***	***0.0025***	***0.0026***	***0.0029***	***0.0032***	***0.0030***	***0.0021***	***0.0016***	***0.0015***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.13E-04	4.79E-04	3.31E-04	2.56E-04	2.19E-04	4.95E-04	1.12E-03	2.15E-03	3.90E-03	3.60E-03	3.05E-03	2.85E-03	1.55E-03	1.39E-03	1.54E-03	1.66E-03	1.73E-03	1.94E-03	2.15E-03	1.97E-03	1.39E-03	1.07E-03	9.82E-04	8.36E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.56E-04	2.40E-04	1.65E-04	1.28E-04	1.09E-04	2.48E-04	5.61E-04	1.08E-03	1.95E-03	1.80E-03	1.52E-03	1.43E-03	7.76E-04	6.96E-04	7.68E-04	8.28E-04	8.66E-04	9.70E-04	1.08E-03	9.87E-04	6.94E-04	5.37E-04	4.91E-04	4.18E-04
	Emission in each Box of 1st jet	g/s	7.13E-05	4.79E-05	3.31E-05	2.56E-05	2.19E-05	4.95E-05	1.12E-04	2.15E-04	3.90E-04	3.60E-04	3.05E-04	2.85E-04	1.55E-04	1.39E-04	1.54E-04	1.66E-04	1.73E-04	1.94E-04	2.15E-04	1.97E-04	1.39E-04	1.07E-04	9.82E-05	8.36E-05
	Emission in each Box of 2nd jet	g/s	3.56E-05	2.40E-05	1.65E-05	1.28E-05	1.09E-05	2.48E-05	5.61E-05	1.08E-04	1.95E-04	1.80E-04	1.52E-04	1.43E-04	7.76E-05	6.96E-05	7.68E-05	8.28E-05	8.66E-05	9.70E-05	1.08E-04	9.87E-05	6.94E-05	5.37E-05	4.91E-05	4.18E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.21E-04	9.26E-05	6.36E-05	4.83E-05	4.07E-05	6.13E-05	1.34E-04	3.19E-04	7.14E-04	6.56E-04	5.50E-04	5.07E-04	3.12E-04	2.77E-04	3.09E-04	3.35E-04	3.51E-04	3.97E-04	4.47E-04	4.08E-04	2.78E-04	2.06E-04	1.86E-04	1.59E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.04E-05	4.63E-05	3.18E-05	2.41E-05	2.03E-05	3.06E-05	6.68E-05	1.60E-04	3.57E-04	3.28E-04	2.75E-04	2.54E-04	1.56E-04	1.39E-04	1.55E-04	1.68E-04	1.75E-04	1.98E-04	2.23E-04	2.04E-04	1.39E-04	1.03E-04	9.30E-05	7.95E-05
	Emission in each Box of 1st jet	g/s	1.21E-05	9.26E-06	6.36E-06	4.83E-06	4.07E-06	6.13E-06	1.34E-05	3.19E-05	7.14E-05	6.56E-05	5.50E-05	5.07E-05	3.12E-05	2.77E-05	3.09E-05	3.35E-05	3.51E-05	3.97E-05	4.47E-05	4.08E-05	2.78E-05	2.06E-05	1.86E-05	1.59E-05
	Emission in each Box of 2nd jet	g/s	6.04E-06	4.63E-06	3.18E-06	2.41E-06	2.03E-06	3.06E-06	6.68E-06	1.60E-05	3.57E-05	3.28E-05	2.75E-05	2.54E-05	1.56E-05	1.39E-05	1.55E-05	1.68E-05	1.75E-05	1.98E-05	2.23E-05	2.04E-05	1.39E-05	1.03E-05	9.30E-06	7.95E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involved	104P4
Road Located	123
Vehicle EF Adopted	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1065	0.0908	0.0946	0.0976	0.0998	0.1872	0.1981	0.1567	0.1924	0.1805	0.1654	0.1585	0.1276	0.1272	0.1306	0.1354	0.1365	0.1451	0.1561	0.1461	0.1243	0.1155	0.1120	0.1113
	NO2	g/vehicle/km	0.0183	0.0177	0.0183	0.0185	0.0187	0.0233	0.0237	0.0232	0.0352	0.0330	0.0299	0.0282	0.0258	0.0253	0.0263	0.0274	0.0277	0.0297	0.0323	0.0302	0.0249	0.0221	0.0212	0.0212
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0016***	***0.0032***	***0.0058***	***0.0053***	***0.0045***	***0.0041***	***0.0022***	***0.0021***	***0.0023***	***0.0025***	***0.0026***	***0.0029***	***0.0034***	***0.0030***	***0.0021***	***0.0016***	***0.0015***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.47E-04	4.52E-04	3.22E-04	2.46E-04	2.10E-04	4.73E-04	1.07E-03	2.12E-03	3.89E-03	3.54E-03	2.99E-03	2.75E-03	1.49E-03	1.40E-03	1.52E-03	1.65E-03	1.72E-03	1.97E-03	2.24E-03	2.00E-03	1.41E-03	1.08E-03	9.73E-04	8.47E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.24E-04	2.26E-04	1.61E-04	1.23E-04	1.05E-04	2.36E-04	5.35E-04	1.06E-03	1.94E-03	1.77E-03	1.50E-03	1.37E-03	7.47E-04	6.98E-04	7.59E-04	8.26E-04	8.59E-04	9.83E-04	1.12E-03	1.00E-03	7.03E-04	5.39E-04	4.86E-04	4.23E-04
	Emission in each Box of 1st jet	g/s	6.47E-05	4.52E-05	3.22E-05	2.46E-05	2.10E-05	4.73E-05	1.07E-04	2.12E-04	3.89E-04	3.54E-04	2.99E-04	2.75E-04	1.49E-04	1.40E-04	1.52E-04	1.65E-04	1.72E-04	1.97E-04	2.24E-04	2.00E-04	1.41E-04	1.08E-04	9.73E-05	8.47E-05
	Emission in each Box of 2nd jet	g/s	3.24E-05	2.26E-05	1.61E-05	1.23E-05	1.05E-05	2.36E-05	5.35E-05	1.06E-04	1.94E-04	1.77E-04	1.50E-04	1.37E-04	7.47E-05	6.98E-05	7.59E-05	8.26E-05	8.59E-05	9.83E-05	1.12E-04	1.00E-04	7.03E-05	5.39E-05	4.86E-05	4.23E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0007***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.11E-04	8.82E-05	6.21E-05	4.68E-05	3.93E-05	5.87E-05	1.28E-04	3.14E-04	7.10E-04	6.47E-04	5.40E-04	4.89E-04	3.02E-04	2.78E-04	3.06E-04	3.35E-04	3.48E-04	4.02E-04	4.62E-04	4.15E-04	2.81E-04	2.06E-04	1.84E-04	1.61E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.55E-05	4.41E-05	3.10E-05	2.34E-05	1.96E-05	2.94E-05	6.39E-05	1.57E-04	3.55E-04	3.24E-04	2.70E-04	2.45E-04	1.51E-04	1.39E-04	1.53E-04	1.67E-04	1.74E-04	2.01E-04	2.31E-04	2.07E-04	1.41E-04	1.03E-04	9.22E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	1.11E-05	8.82E-06	6.21E-06	4.68E-06	3.93E-06	5.87E-06	1.28E-05	3.14E-05	7.10E-05	6.47E-05	5.40E-05	4.89E-05	3.02E-05	2.78E-05	3.06E-05	3.35E-05	3.48E-05	4.02E-05	4.62E-05	4.15E-05	2.81E-05	2.06E-05	1.84E-05	1.61E-05
	Emission in each Box of 2nd jet	g/s	5.55E-06	4.41E-06	3.10E-06	2.34E-06	1.96E-06	2.94E-06	6.39E-06	1.57E-05	3.55E-05	3.24E-05	2.70E-05	2.45E-05	1.51E-05	1.39E-05	1.53E-05	1.67E-05	1.74E-05	2.01E-05	2.31E-05	2.07E-05	1.41E-05	1.03E-05	9.22E-06	8.05E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1042	0.0876	0.0906	0.0933	0.0940	0.1824	0.1902	0.1494	0.1821	0.1806	0.1681	0.1664	0.1324	0.1293	0.1333	0.1392	0.1353	0.1432	0.1509	0.1403	0.1161	0.1079	0.1048	0.1010
	NO2	g/vehicle/km	0.0178	0.0171	0.0175	0.0178	0.0176	0.0226	0.0227	0.0223	0.0334	0.0330	0.0303	0.0296	0.0267	0.0257	0.0268	0.0282	0.0274	0.0293	0.0313	0.0291	0.0233	0.0208	0.0200	0.0194
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0015***	***0.0030***	***0.0055***	***0.0053***	***0.0046***	***0.0043***	***0.0023***	***0.0021***	***0.0023***	***0.0025***	***0.0026***	***0.0029***	***0.0032***	***0.0029***	***0.0020***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.33E-04	4.36E-04	3.08E-04	2.36E-04	1.98E-04	4.61E-04	1.03E-03	2.02E-03	3.68E-03	3.54E-03	3.04E-03	2.89E-03	1.55E-03	1.42E-03	1.55E-03	1.70E-03	1.70E-03	1.94E-03	2.16E-03	1.92E-03	1.31E-03	1.01E-03	9.10E-04	7.68E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.16E-04	2.18E-04	1.54E-04	1.18E-04	9.88E-05	2.30E-04	5.14E-04	1.01E-03	1.84E-03	1.77E-03	1.52E-03	1.44E-03	7.76E-04	7.09E-04	7.75E-04	8.49E-04	8.52E-04	9.70E-04	1.08E-03	9.62E-04	6.56E-04	5.03E-04	4.55E-04	3.84E-04
	Emission in each Box of 1st jet	g/s	6.33E-05	4.36E-05	3.08E-05	2.36E-05	1.98E-05	4.61E-05	1.03E-04	2.02E-04	3.68E-04	3.54E-04	3.04E-04	2.89E-04	1.55E-04	1.42E-04	1.55E-04	1.70E-04	1.70E-04	1.94E-04	2.16E-04	1.92E-04	1.31E-04	1.01E-04	9.10E-05	7.68E-05
	Emission in each Box of 2nd jet	g/s	3.16E-05	2.18E-05	1.54E-05	1.18E-05	9.88E-06	2.30E-05	5.14E-05	1.01E-04	1.84E-04	1.77E-04	1.52E-04	1.44E-04	7.76E-05	7.09E-05	7.75E-05	8.49E-05	8.52E-05	9.70E-05	1.08E-04	9.62E-05	6.56E-05	5.03E-05	4.55E-05	3.84E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0010***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.08E-04	8.51E-05	5.96E-05	4.48E-05	3.71E-05	5.71E-05	1.23E-04	3.01E-04	6.76E-04	6.47E-04	5.49E-04	5.13E-04	3.12E-04	2.82E-04	3.12E-04	3.44E-04	3.45E-04	3.97E-04	4.48E-04	3.99E-04	2.63E-04	1.94E-04	1.74E-04	1.48E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.41E-05	4.26E-05	2.98E-05	2.24E-05	1.86E-05	2.86E-05	6.14E-05	1.50E-04	3.38E-04	3.24E-04	2.74E-04	2.56E-04	1.56E-04	1.41E-04	1.56E-04	1.72E-04	1.73E-04	1.98E-04	2.24E-04	1.99E-04	1.32E-04	9.69E-05	8.69E-05	7.38E-05
	Emission in each Box of 1st jet	g/s	1.08E-05	8.51E-06	5.96E-06	4.48E-06	3.71E-06	5.71E-06	1.23E-05	3.01E-05	6.76E-05	6.47E-05	5.49E-05	5.13E-05	3.12E-05	2.82E-05	3.12E-05	3.44E-05	3.45E-05	3.97E-05	4.48E-05	3.99E-05	2.63E-05	1.94E-05	1.74E-05	1.48E-05
	Emission in each Box of 2nd jet	g/s	5.41E-06	4.26E-06	2.98E-06	2.24E-06	1.86E-06	2.86E-06	6.14E-06	1.50E-05	3.38E-05	3.24E-05	2.74E-05	2.56E-05	1.56E-05	1.41E-05	1.56E-05	1.72E-05	1.73E-05	1.98E-05	2.24E-05	1.99E-05	1.32E-05	9.69E-06	8.69E-06	7.38E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1103	0.0900	0.0938	0.0984	0.0998	0.1864	0.1973	0.1487	0.1839	0.1769	0.1643	0.1591	0.1287	0.1290	0.1335	0.1373	0.1446	0.1501	0.1596	0.1485	0.1217	0.1095	0.1088	0.1065
	NO2	g/vehicle/km	0.0188	0.0176	0.0181	0.0187	0.0187	0.0232	0.0236	0.0221	0.0337	0.0324	0.0297	0.0284	0.0260	0.0257	0.0269	0.0278	0.0292	0.0306	0.0329	0.0307	0.0244	0.0211	0.0207	0.0203
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0016***	***0.0030***	***0.0056***	***0.0052***	***0.0045***	***0.0041***	***0.0023***	***0.0021***	***0.0023***	***0.0025***	***0.0027***	***0.0031***	***0.0034***	***0.0031***	***0.0021***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.70E-04	4.49E-04	3.19E-04	2.49E-04	2.10E-04	4.71E-04	1.07E-03	2.01E-03	3.72E-03	3.47E-03	2.97E-03	2.76E-03	1.51E-03	1.42E-03	1.55E-03	1.68E-03	1.82E-03	2.03E-03	2.29E-03	2.04E-03	1.38E-03	1.02E-03	9.45E-04	8.10E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.35E-04	2.24E-04	1.59E-04	1.24E-04	1.05E-04	2.35E-04	5.33E-04	1.01E-03	1.86E-03	1.74E-03	1.49E-03	1.38E-03	7.54E-04	7.08E-04	7.76E-04	8.38E-04	9.10E-04	1.02E-03	1.14E-03	1.02E-03	6.88E-04	5.11E-04	4.73E-04	4.05E-04
	Emission in each Box of 1st jet	g/s	6.70E-05	4.49E-05	3.19E-05	2.49E-05	2.10E-05	4.71E-05	1.07E-04	2.01E-04	3.72E-04	3.47E-04	2.97E-04	2.76E-04	1.51E-04	1.42E-04	1.55E-04	1.68E-04	1.82E-04	2.03E-04	2.29E-04	2.04E-04	1.38E-04	1.02E-04	9.45E-05	8.10E-05
	Emission in each Box of 2nd jet	g/s	3.35E-05	2.24E-05	1.59E-05	1.24E-05	1.05E-05	2.35E-05	5.33E-05	1.01E-04	1.86E-04	1.74E-04	1.49E-04	1.38E-04	7.54E-05	7.08E-05	7.76E-05	8.38E-05	9.10E-05	1.02E-04	1.14E-04	1.02E-04	6.88E-05	5.11E-05	4.73E-05	4.05E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0010***	***0.0008***	***0.0007***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.14E-04	8.75E-05	6.17E-05	4.72E-05	3.93E-05	5.85E-05	1.27E-04	2.99E-04	6.82E-04	6.35E-04	5.37E-04	4.92E-04	3.04E-04	2.82E-04	3.12E-04	3.39E-04	3.68E-04	4.15E-04	4.72E-04	4.21E-04	2.76E-04	1.97E-04	1.80E-04	1.55E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.72E-05	4.38E-05	3.08E-05	2.36E-05	1.96E-05	2.92E-05	6.37E-05	1.50E-04	3.41E-04	3.18E-04	2.69E-04	2.46E-04	1.52E-04	1.41E-04	1.56E-04	1.70E-04	1.84E-04	2.08E-04	2.36E-04	2.10E-04	1.38E-04	9.83E-05	9.00E-05	7.73E-05
	Emission in each Box of 1st jet	g/s	1.14E-05	8.75E-06	6.17E-06	4.72E-06	3.93E-06	5.85E-06	1.27E-05	2.99E-05	6.82E-05	6.35E-05	5.37E-05	4.92E-05	3.04E-05	2.82E-05	3.12E-05	3.39E-05	3.68E-05	4.15E-05	4.72E-05	4.21E-05	2.76E-05	1.97E-05	1.80E-05	1.55E-05
	Emission in each Box of 2nd jet	g/s	5.72E-06	4.38E-06	3.08E-06	2.36E-06	1.96E-06	2.92E-06	6.37E-06	1.50E-05	3.41E-05	3.18E-05	2.69E-05	2.46E-05	1.52E-05	1.41E-05	1.56E-05	1.70E-05	1.84E-05	2.08E-05	2.36E-05	2.10E-05	1.38E-05	9.83E-06	9.00E-06	7.73E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1095	0.0922	0.0925	0.0943	0.0992	0.1815	0.1930	0.1462	0.1759	0.1690	0.1629	0.1519	0.1266	0.1254	0.1325	0.1301	0.1299	0.1420	0.1523	0.1417	0.1216	0.1106	0.1086	0.1053
	NO2	g/vehicle/km	0.0187	0.0179	0.0179	0.0179	0.0186	0.0225	0.0230	0.0218	0.0324	0.0310	0.0294	0.0271	0.0256	0.0250	0.0267	0.0264	0.0264	0.0291	0.0315	0.0293	0.0244	0.0213	0.0207	0.0201
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0016***	***0.0030***	***0.0053***	***0.0050***	***0.0044***	***0.0040***	***0.0022***	***0.0021***	***0.0023***	***0.0024***	***0.0025***	***0.0029***	***0.0033***	***0.0029***	***0.0021***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.65E-04	4.59E-04	3.14E-04	2.38E-04	2.09E-04	4.58E-04	1.04E-03	1.98E-03	3.55E-03	3.32E-03	2.95E-03	2.63E-03	1.48E-03	1.38E-03	1.54E-03	1.59E-03	1.63E-03	1.92E-03	2.18E-03	1.94E-03	1.38E-03	1.03E-03	9.43E-04	8.01E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.33E-04	2.30E-04	1.57E-04	1.19E-04	1.04E-04	2.29E-04	5.21E-04	9.88E-04	1.78E-03	1.66E-03	1.47E-03	1.32E-03	7.41E-04	6.88E-04	7.71E-04	7.94E-04	8.17E-04	9.62E-04	1.09E-03	9.72E-04	6.88E-04	5.16E-04	4.71E-04	4.00E-04
	Emission in each Box of 1st jet	g/s	6.65E-05	4.59E-05	3.14E-05	2.38E-05	2.09E-05	4.58E-05	1.04E-04	1.98E-04	3.55E-04	3.32E-04	2.95E-04	2.63E-04	1.48E-04	1.38E-04	1.54E-04	1.59E-04	1.63E-04	1.92E-04	2.18E-04	1.94E-04	1.38E-04	1.03E-04	9.43E-05	8.01E-05
	Emission in each Box of 2nd jet	g/s	3.33E-05	2.30E-05	1.57E-05	1.19E-05	1.04E-05	2.29E-05	5.21E-05	9.88E-05	1.78E-04	1.66E-04	1.47E-04	1.32E-04	7.41E-05	6.88E-05	7.71E-05	7.94E-05	8.17E-05	9.62E-05	1.09E-04	9.72E-05	6.88E-05	5.16E-05	4.71E-05	4.00E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0010***	***0.0009***	***0.0008***	***0.0007***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.14E-04	8.93E-05	6.08E-05	4.52E-05	3.91E-05	5.69E-05	1.24E-04	2.95E-04	6.54E-04	6.09E-04	5.33E-04	4.70E-04	2.99E-04	2.74E-04	3.10E-04	3.22E-04	3.33E-04	3.94E-04	4.52E-04	4.03E-04	2.76E-04	1.98E-04	1.79E-04	1.53E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.68E-05	4.47E-05	3.04E-05	2.26E-05	1.95E-05	2.85E-05	6.22E-05	1.47E-04	3.27E-04	3.04E-04	2.66E-04	2.35E-04	1.50E-04	1.37E-04	1.55E-04	1.61E-04	1.66E-04	1.97E-04	2.26E-04	2.01E-04	1.38E-04	9.91E-05	8.97E-05	7.66E-05
	Emission in each Box of 1st jet	g/s	1.14E-05	8.93E-06	6.08E-06	4.52E-06	3.91E-06	5.69E-06	1.24E-05	2.95E-05	6.54E-05	6.09E-05	5.33E-05	4.70E-05	2.99E-05	2.74E-05	3.10E-05	3.22E-05	3.33E-05	3.94E-05	4.52E-05	4.03E-05	2.76E-05	1.98E-05	1.79E-05	1.53E-05
	Emission in each Box of 2nd jet	g/s	5.68E-06	4.47E-06	3.04E-06	2.26E-06	1.95E-06	2.85E-06	6.22E-06	1.47E-05	3.27E-05	3.04E-05	2.66E-05	2.35E-05	1.50E-05	1.37E-05	1.55E-05	1.61E-05	1.66E-05	1.97E-05	2.26E-05	2.01E-05	1.38E-05	9.91E-06	8.97E-06	7.66E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1254	0.1072	0.1081	0.1121	0.1156	0.2198	0.2312	0.1757	0.2107	0.1999	0.1827	0.1787	0.1452	0.1406	0.1432	0.1504	0.1505	0.1600	0.1716	0.1609	0.1375	0.1251	0.1240	0.1225
	NO2	g/vehicle/km	0.0211	0.0204	0.0205	0.0209	0.0212	0.0269	0.0273	0.0258	0.0382	0.0362	0.0327	0.0315	0.0290	0.0277	0.0286	0.0302	0.0302	0.0324	0.0351	0.0330	0.0272	0.0237	0.0232	0.0230
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0008***	***0.0019***	***0.0036***	***0.0064***	***0.0059***	***0.0050***	***0.0046***	***0.0026***	***0.0023***	***0.0025***	***0.0028***	***0.0028***	***0.0033***	***0.0037***	***0.0033***	***0.0023***	***0.0017***	***0.0016***	***0.0014***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.62E-04	5.34E-04	3.68E-04	2.83E-04	2.43E-04	5.55E-04	1.25E-03	2.37E-03	4.25E-03	3.92E-03	3.31E-03	3.10E-03	1.70E-03	1.54E-03	1.67E-03	1.83E-03	1.89E-03	2.17E-03	2.46E-03	2.21E-03	1.55E-03	1.17E-03	1.08E-03	9.32E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.81E-04	2.67E-04	1.84E-04	1.42E-04	1.22E-04	2.78E-04	6.25E-04	1.19E-03	2.13E-03	1.96E-03	1.65E-03	1.55E-03	8.50E-04	7.72E-04	8.33E-04	9.17E-04	9.47E-04	1.08E-03	1.23E-03	1.10E-03	7.77E-04	5.83E-04	5.38E-04	4.66E-04
	Emission in each Box of 1st jet	g/s	7.62E-05	5.34E-05	3.68E-05	2.83E-05	2.43E-05	5.55E-05	1.25E-04	2.37E-04	4.25E-04	3.92E-04	3.31E-04	3.10E-04	1.70E-04	1.54E-04	1.67E-04	1.83E-04	1.89E-04	2.17E-04	2.46E-04	2.21E-04	1.55E-04	1.17E-04	1.08E-04	9.32E-05
	Emission in each Box of 2nd jet	g/s	3.81E-05	2.67E-05	1.84E-05	1.42E-05	1.22E-05	2.78E-05	6.25E-05	1.19E-04	2.13E-04	1.96E-04	1.65E-04	1.55E-04	8.50E-05	7.72E-05	8.33E-05	9.17E-05	9.47E-05	1.08E-04	1.23E-04	1.10E-04	7.77E-05	5.83E-05	5.38E-05	4.66E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.28E-04	1.02E-04	6.97E-05	5.27E-05	4.45E-05	6.78E-05	1.47E-04	3.49E-04	7.71E-04	7.10E-04	5.92E-04	5.47E-04	3.39E-04	3.04E-04	3.33E-04	3.68E-04	3.80E-04	4.39E-04	5.03E-04	4.52E-04	3.07E-04	2.21E-04	2.02E-04	1.75E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.41E-05	5.08E-05	3.48E-05	2.64E-05	2.23E-05	3.39E-05	7.36E-05	1.74E-04	3.85E-04	3.55E-04	2.96E-04	2.73E-04	1.70E-04	1.52E-04	1.66E-04	1.84E-04	1.90E-04	2.20E-04	2.51E-04	2.26E-04	1.54E-04	1.11E-04	1.01E-04	8.76E-05
	Emission in each Box of 1st jet	g/s	1.28E-05	1.02E-05	6.97E-06	5.27E-06	4.45E-06	6.78E-06	1.47E-05	3.49E-05	7.71E-05	7.10E-05	5.92E-05	5.47E-05	3.39E-05	3.04E-05	3.33E-05	3.68E-05	3.80E-05	4.39E-05	5.03E-05	4.52E-05	3.07E-05	2.21E-05	2.02E-05	1.75E-05
	Emission in each Box of 2nd jet	g/s	6.41E-06	5.08E-06	3.48E-06	2.64E-06	2.23E-06	3.39E-06	7.36E-06	1.74E-05	3.85E-05	3.55E-05	2.96E-05	2.73E-05	1.70E-05	1.52E-05	1.66E-05	1.84E-05	1.90E-05	2.20E-05	2.51E-05	2.26E-05	1.54E-05	1.11E-05	1.01E-05	8.76E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1378	0.1155	0.1185	0.1235	0.1269	0.2384	0.2534	0.1906	0.2287	0.2162	0.1985	0.1913	0.1564	0.1530	0.1564	0.1614	0.1621	0.1712	0.1834	0.1752	0.1478	0.1373	0.1352	0.1330
	NO2	g/vehicle/km	0.0229	0.0218	0.0221	0.0226	0.0229	0.0290	0.0297	0.0278	0.0410	0.0388	0.0351	0.0334	0.0308	0.0298	0.0309	0.0321	0.0322	0.0344	0.0372	0.0355	0.0290	0.0257	0.0251	0.0247
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0039***	***0.0069***	***0.0064***	***0.0054***	***0.0050***	***0.0027***	***0.0025***	***0.0027***	***0.0030***	***0.0031***	***0.0035***	***0.0039***	***0.0036***	***0.0025***	***0.0019***	***0.0018***	***0.0015***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.37E-04	5.75E-04	4.03E-04	3.12E-04	2.67E-04	6.02E-04	1.37E-03	2.58E-03	4.62E-03	4.24E-03	3.59E-03	3.32E-03	1.83E-03	1.68E-03	1.82E-03	1.97E-03	2.04E-03	2.32E-03	2.63E-03	2.40E-03	1.67E-03	1.28E-03	1.17E-03	1.01E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.19E-04	2.88E-04	2.01E-04	1.56E-04	1.33E-04	3.01E-04	6.84E-04	1.29E-03	2.31E-03	2.12E-03	1.80E-03	1.66E-03	9.16E-04	8.39E-04	9.10E-04	9.85E-04	1.02E-03	1.16E-03	1.31E-03	1.20E-03	8.36E-04	6.40E-04	5.87E-04	5.06E-04
	Emission in each Box of 1st jet	g/s	8.37E-05	5.75E-05	4.03E-05	3.12E-05	2.67E-05	6.02E-05	1.37E-04	2.58E-04	4.62E-04	4.24E-04	3.59E-04	3.32E-04	1.83E-04	1.68E-04	1.82E-04	1.97E-04	2.04E-04	2.32E-04	2.63E-04	2.40E-04	1.67E-04	1.28E-04	1.17E-04	1.01E-04
	Emission in each Box of 2nd jet	g/s	4.19E-05	2.88E-05	2.01E-05	1.56E-05	1.33E-05	3.01E-05	6.84E-05	1.29E-04	2.31E-04	2.12E-04	1.80E-04	1.66E-04	9.16E-05	8.39E-05	9.10E-05	9.85E-05	1.02E-04	1.16E-04	1.31E-04	1.20E-04	8.36E-05	6.40E-05	5.87E-05	5.06E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0012***	***0.0011***	***0.0010***	***0.0009***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.39E-04	1.08E-04	7.52E-05	5.72E-05	4.82E-05	7.31E-05	1.60E-04	3.76E-04	8.28E-04	7.61E-04	6.35E-04	5.79E-04	3.61E-04	3.27E-04	3.59E-04	3.91E-04	4.05E-04	4.66E-04	5.33E-04	4.87E-04	3.28E-04	2.40E-04	2.18E-04	1.88E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.96E-05	5.42E-05	3.76E-05	2.86E-05	2.41E-05	3.66E-05	8.01E-05	1.88E-04	4.14E-04	3.80E-04	3.18E-04	2.90E-04	1.81E-04	1.63E-04	1.80E-04	1.96E-04	2.03E-04	2.33E-04	2.67E-04	2.44E-04	1.64E-04	1.20E-04	1.09E-04	9.40E-05
	Emission in each Box of 1st jet	g/s	1.39E-05	1.08E-05	7.52E-06	5.72E-06	4.82E-06	7.31E-06	1.60E-05	3.76E-05	8.28E-05	7.61E-05	6.35E-05	5.79E-05	3.61E-05	3.27E-05	3.59E-05	3.91E-05	4.05E-05	4.66E-05	5.33E-05	4.87E-05	3.28E-05	2.40E-05	2.18E-05	1.88E-05
	Emission in each Box of 2nd jet	g/s	6.96E-06	5.42E-06	3.76E-06	2.86E-06	2.41E-06	3.66E-06	8.01E-06	1.88E-05	4.14E-05	3.80E-05	3.18E-05	2.90E-05	1.81E-05	1.63E-05	1.80E-05	1.96E-05	2.03E-05	2.33E-05	2.67E-05	2.44E-05	1.64E-05	1.20E-05	1.09E-05	9.40E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1439	0.1215	0.1246	0.1301	0.1330	0.2464	0.2620	0.1985	0.2364	0.2233	0.2051	0.1990	0.1620	0.1574	0.1611	0.1667	0.1685	0.1799	0.1903	0.1817	0.1537	0.1426	0.1409	0.1390
	NO2	g/vehicle/km	0.0237	0.0225	0.0229	0.0235	0.0237	0.0297	0.0304	0.0287	0.0421	0.0397	0.0359	0.0344	0.0316	0.0304	0.0316	0.0328	0.0332	0.0357	0.0383	0.0365	0.0298	0.0265	0.0258	0.0256
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0040***	***0.0072***	***0.0066***	***0.0056***	***0.0052***	***0.0028***	***0.0026***	***0.0028***	***0.0031***	***0.0032***	***0.0037***	***0.0041***	***0.0037***	***0.0026***	***0.0020***	***0.0018***	***0.0016***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.74E-04	6.05E-04	4.24E-04	3.28E-04	2.80E-04	6.22E-04	1.42E-03	2.68E-03	4.77E-03	4.38E-03	3.71E-03	3.45E-03	1.90E-03	1.73E-03	1.87E-03	2.03E-03	2.12E-03	2.44E-03	2.73E-03	2.49E-03	1.74E-03	1.33E-03	1.22E-03	1.06E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.37E-04	3.03E-04	2.12E-04	1.64E-04	1.40E-04	3.11E-04	7.08E-04	1.34E-03	2.39E-03	2.19E-03	1.86E-03	1.73E-03	9.49E-04	8.64E-04	9.37E-04	1.02E-03	1.06E-03	1.22E-03	1.36E-03	1.25E-03	8.69E-04	6.65E-04	6.12E-04	5.29E-04
	Emission in each Box of 1st jet	g/s	8.74E-05	6.05E-05	4.24E-05	3.28E-05	2.80E-05	6.22E-05	1.42E-04	2.68E-04	4.77E-04	4.38E-04	3.71E-04	3.45E-04	1.90E-04	1.73E-04	1.87E-04	2.03E-04	2.12E-04	2.44E-04	2.73E-04	2.49E-04	1.74E-04	1.33E-04	1.22E-04	1.06E-04
	Emission in each Box of 2nd jet	g/s	4.37E-05	3.03E-05	2.12E-05	1.64E-05	1.40E-05	3.11E-05	7.08E-05	1.34E-04	2.39E-04	2.19E-04	1.86E-04	1.73E-04	9.49E-05	8.64E-05	9.37E-05	1.02E-04	1.06E-04	1.22E-04	1.36E-04	1.25E-04	8.69E-05	6.65E-05	6.12E-05	5.29E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0006***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.44E-04	1.12E-04	7.78E-05	5.93E-05	4.98E-05	7.51E-05	1.64E-04	3.87E-04	8.50E-04	7.79E-04	6.50E-04	5.97E-04	3.70E-04	3.34E-04	3.67E-04	4.01E-04	4.18E-04	4.84E-04	5.48E-04	5.00E-04	3.37E-04	2.47E-04	2.24E-04	1.94E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.19E-05	5.61E-05	3.89E-05	2.96E-05	2.49E-05	3.75E-05	8.22E-05	1.94E-04	4.25E-04	3.89E-04	3.25E-04	2.98E-04	1.85E-04	1.67E-04	1.84E-04	2.00E-04	2.09E-04	2.42E-04	2.74E-04	2.50E-04	1.69E-04	1.23E-04	1.12E-04	9.72E-05
	Emission in each Box of 1st jet	g/s	1.44E-05	1.12E-05	7.78E-06	5.93E-06	4.98E-06	7.51E-06	1.64E-05	3.87E-05	8.50E-05	7.79E-05	6.50E-05	5.97E-05	3.70E-05	3.34E-05	3.67E-05	4.01E-05	4.18E-05	4.84E-05	5.48E-05	5.00E-05	3.37E-05	2.47E-05	2.24E-05	1.94E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	5.61E-06	3.89E-06	2.96E-06	2.49E-06	3.75E-06	8.22E-06	1.94E-05	4.25E-05	3.89E-05	3.25E-05	2.98E-05	1.85E-05	1.67E-05	1.84E-05	2.00E-05	2.09E-05	2.42E-05	2.74E-05	2.50E-05	1.69E-05	1.23E-05	1.12E-05	9.72E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1995	0.1521	0.1574	0.1697	0.1812	0.4129	0.4397	0.2977	0.2228	0.2196	0.2243	0.2299	0.1713	0.1736	0.1709	0.1716	0.1696	0.1693	0.1669	0.1632	0.1679	0.1765	0.1759	0.1703
	NO2	g/vehicle/km	0.0297	0.0277	0.0286	0.0296	0.0302	0.0420	0.0431	0.0350	0.0311	0.0309	0.0316	0.0319	0.0293	0.0295	0.0293	0.0292	0.0288	0.0287	0.0285	0.0283	0.0286	0.0292	0.0290	0.0286
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0071***	***0.0044***	***0.0031***	***0.0025***	***0.0022***	***0.0066***	***0.0150***	***0.0241***	***0.0264***	***0.0252***	***0.0237***	***0.0233***	***0.0159***	***0.0151***	***0.0158***	***0.0166***	***0.0171***	***0.0184***	***0.0192***	***0.0181***	***0.0152***	***0.0131***	***0.0122***	***0.0104***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.72E-03	2.90E-03	2.09E-03	1.68E-03	1.50E-03	4.39E-03	1.00E-02	1.60E-02	1.76E-02	1.68E-02	1.58E-02	1.55E-02	1.06E-02	1.01E-02	1.05E-02	1.11E-02	1.14E-02	1.23E-02	1.28E-02	1.20E-02	1.01E-02	8.73E-03	8.15E-03	6.95E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.36E-03	1.45E-03	1.04E-03	8.38E-04	7.49E-04	2.20E-03	5.00E-03	8.02E-03	8.80E-03	8.40E-03	7.91E-03	7.77E-03	5.31E-03	5.04E-03	5.26E-03	5.55E-03	5.71E-03	6.15E-03	6.41E-03	6.02E-03	5.07E-03	4.37E-03	4.07E-03	3.48E-03
	Emission in each Box of 1st jet	g/s	2.36E-03	1.45E-03	1.04E-03	8.38E-04	7.49E-04	2.20E-03	5.00E-03	8.02E-03	8.80E-03	8.40E-03	7.91E-03	7.77E-03	5.31E-03	5.04E-03	5.26E-03	5.55E-03	5.71E-03	6.15E-03	6.41E-03	6.02E-03	5.07E-03	4.37E-03	4.07E-03	3.48E-03
	Emission in each Box of 2nd jet	g/s	2.36E-03	1.45E-03	1.04E-03	8.38E-04	7.49E-04	2.20E-03	5.00E-03	8.02E-03	8.80E-03	8.40E-03	7.91E-03	7.77E-03	5.31E-03	5.04E-03	5.26E-03	5.55E-03	5.71E-03	6.15E-03	6.41E-03	6.02E-03	5.07E-03	4.37E-03	4.07E-03	3.48E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0007***	***0.0015***	***0.0028***	***0.0037***	***0.0035***	***0.0033***	***0.0032***	***0.0027***	***0.0026***	***0.0027***	***0.0028***	***0.0029***	***0.0031***	***0.0033***	***0.0031***	***0.0026***	***0.0022***	***0.0020***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.03E-04	5.30E-04	3.79E-04	2.93E-04	2.50E-04	4.47E-04	9.82E-04	1.89E-03	2.46E-03	2.37E-03	2.22E-03	2.16E-03	1.82E-03	1.71E-03	1.80E-03	1.89E-03	1.94E-03	2.09E-03	2.19E-03	2.09E-03	1.73E-03	1.44E-03	1.34E-03	1.17E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.51E-04	2.65E-04	1.90E-04	1.46E-04	1.25E-04	2.24E-04	4.91E-04	9.44E-04	1.23E-03	1.18E-03	1.11E-03	1.08E-03	9.08E-04	8.55E-04	9.02E-04	9.45E-04	9.69E-04	1.04E-03	1.09E-03	1.04E-03	8.64E-04	7.22E-04	6.70E-04	5.84E-04
	Emission in each Box of 1st jet	g/s	3.51E-04	2.65E-04	1.90E-04	1.46E-04	1.25E-04	2.24E-04	4.91E-04	9.44E-04	1.23E-03	1.18E-03	1.11E-03	1.08E-03	9.08E-04	8.55E-04	9.02E-04	9.45E-04	9.69E-04	1.04E-03	1.09E-03	1.04E-03	8.64E-04	7.22E-04	6.70E-04	5.84E-04
	Emission in each Box of 2nd jet	g/s	3.51E-04	2.65E-04	1.90E-04	1.46E-04	1.25E-04	2.24E-04	4.91E-04	9.44E-04	1.23E-03	1.18E-03	1.11E-03	1.08E-03	9.08E-04	8.55E-04	9.02E-04	9.45E-04	9.69E-04	1.04E-03	1.09E-03	1.04E-03	8.64E-04	7.22E-04	6.70E-04	5.84E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1823	0.1378	0.1421	0.1540	0.1692	0.3919	0.4194	0.2813	0.2103	0.2100	0.2153	0.2197	0.1626	0.1628	0.1612	0.1624	0.1604	0.1581	0.1521	0.1485	0.1521	0.1605	0.1601	0.1548
	NO2	g/vehicle/km	0.0274	0.0256	0.0263	0.0275	0.0287	0.0402	0.0414	0.0334	0.0297	0.0298	0.0305	0.0308	0.0281	0.0280	0.0280	0.0280	0.0275	0.0272	0.0263	0.0262	0.0263	0.0269	0.0267	0.0263
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0065***	***0.0039***	***0.0028***	***0.0023***	***0.0021***	***0.0063***	***0.0143***	***0.0227***	***0.0249***	***0.0241***	***0.0228***	***0.0223***	***0.0151***	***0.0142***	***0.0149***	***0.0157***	***0.0162***	***0.0172***	***0.0175***	***0.0164***	***0.0138***	***0.0119***	***0.0111***	***0.0095***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.31E-03	2.63E-03	1.88E-03	1.52E-03	1.40E-03	4.17E-03	9.54E-03	1.52E-02	1.66E-02	1.61E-02	1.52E-02	1.48E-02	1.01E-02	9.44E-03	9.93E-03	1.05E-02	1.08E-02	1.15E-02	1.17E-02	1.09E-02	9.19E-03	7.94E-03	7.41E-03	6.32E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.16E-03	1.32E-03	9.42E-04	7.60E-04	7.00E-04	2.09E-03	4.77E-03	7.58E-03	8.31E-03	8.04E-03	7.59E-03	7.42E-03	5.04E-03	4.72E-03	4.96E-03	5.25E-03	5.41E-03	5.74E-03	5.84E-03	5.47E-03	4.59E-03	3.97E-03	3.71E-03	3.16E-03
	Emission in each Box of 1st jet	g/s	2.16E-03	1.32E-03	9.42E-04	7.60E-04	7.00E-04	2.09E-03	4.77E-03	7.58E-03	8.31E-03	8.04E-03	7.59E-03	7.42E-03	5.04E-03	4.72E-03	4.96E-03	5.25E-03	5.41E-03	5.74E-03	5.84E-03	5.47E-03	4.59E-03	3.97E-03	3.71E-03	3.16E-03
	Emission in each Box of 2nd jet	g/s	2.16E-03	1.32E-03	9.42E-04	7.60E-04	7.00E-04	2.09E-03	4.77E-03	7.58E-03	8.31E-03	8.04E-03	7.59E-03	7.42E-03	5.04E-03	4.72E-03	4.96E-03	5.25E-03	5.41E-03	5.74E-03	5.84E-03	5.47E-03	4.59E-03	3.97E-03	3.71E-03	3.16E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0027***	***0.0035***	***0.0034***	***0.0032***	***0.0031***	***0.0026***	***0.0024***	***0.0026***	***0.0027***	***0.0028***	***0.0030***	***0.0030***	***0.0029***	***0.0024***	***0.0020***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.49E-04	4.89E-04	3.49E-04	2.71E-04	2.38E-04	4.28E-04	9.42E-04	1.80E-03	2.35E-03	2.28E-03	2.15E-03	2.08E-03	1.74E-03	1.62E-03	1.72E-03	1.81E-03	1.86E-03	1.98E-03	2.02E-03	1.93E-03	1.59E-03	1.33E-03	1.24E-03	1.08E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.25E-04	2.44E-04	1.74E-04	1.36E-04	1.19E-04	2.14E-04	4.71E-04	9.00E-04	1.17E-03	1.14E-03	1.08E-03	1.04E-03	8.71E-04	8.12E-04	8.62E-04	9.06E-04	9.28E-04	9.88E-04	1.01E-03	9.65E-04	7.95E-04	6.66E-04	6.18E-04	5.38E-04
	Emission in each Box of 1st jet	g/s	3.25E-04	2.44E-04	1.74E-04	1.36E-04	1.19E-04	2.14E-04	4.71E-04	9.00E-04	1.17E-03	1.14E-03	1.08E-03	1.04E-03	8.71E-04	8.12E-04	8.62E-04	9.06E-04	9.28E-04	9.88E-04	1.01E-03	9.65E-04	7.95E-04	6.66E-04	6.18E-04	5.38E-04
	Emission in each Box of 2nd jet	g/s	3.25E-04	2.44E-04	1.74E-04	1.36E-04	1.19E-04	2.14E-04	4.71E-04	9.00E-04	1.17E-03	1.14E-03	1.08E-03	1.04E-03	8.71E-04	8.12E-04	8.62E-04	9.06E-04	9.28E-04	9.88E-04	1.01E-03	9.65E-04	7.95E-04	6.66E-04	6.18E-04	5.38E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1839	0.1376	0.1421	0.1543	0.1660	0.3826	0.4063	0.2770	0.2065	0.2039	0.2043	0.2089	0.1541	0.1564	0.1537	0.1549	0.1537	0.1531	0.1512	0.1486	0.1541	0.1608	0.1631	0.1584
	NO2	g/vehicle/km	0.0277	0.0257	0.0264	0.0275	0.0282	0.0393	0.0402	0.0329	0.0292	0.0290	0.0291	0.0294	0.0269	0.0270	0.0269	0.0269	0.0265	0.0264	0.0263	0.0262	0.0267	0.0270	0.0272	0.0269
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0065***	***0.0039***	***0.0028***	***0.0023***	***0.0021***	***0.0061***	***0.0139***	***0.0224***	***0.0245***	***0.0234***	***0.0216***	***0.0212***	***0.0143***	***0.0136***	***0.0142***	***0.0150***	***0.0155***	***0.0167***	***0.0174***	***0.0164***	***0.0140***	***0.0119***	***0.0113***	***0.0097***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.35E-03	2.63E-03	1.88E-03	1.52E-03	1.37E-03	4.07E-03	9.25E-03	1.49E-02	1.63E-02	1.56E-02	1.44E-02	1.41E-02	9.55E-03	9.07E-03	9.46E-03	1.00E-02	1.04E-02	1.11E-02	1.16E-02	1.10E-02	9.31E-03	7.96E-03	7.55E-03	6.47E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.18E-03	1.31E-03	9.42E-04	7.62E-04	6.87E-04	2.04E-03	4.62E-03	7.46E-03	8.15E-03	7.80E-03	7.20E-03	7.05E-03	4.78E-03	4.54E-03	4.73E-03	5.01E-03	5.18E-03	5.56E-03	5.80E-03	5.48E-03	4.65E-03	3.98E-03	3.78E-03	3.23E-03
	Emission in each Box of 1st jet	g/s	2.18E-03	1.31E-03	9.42E-04	7.62E-04	6.87E-04	2.04E-03	4.62E-03	7.46E-03	8.15E-03	7.80E-03	7.20E-03	7.05E-03	4.78E-03	4.54E-03	4.73E-03	5.01E-03	5.18E-03	5.56E-03	5.80E-03	5.48E-03	4.65E-03	3.98E-03	3.78E-03	3.23E-03
	Emission in each Box of 2nd jet	g/s	2.18E-03	1.31E-03	9.42E-04	7.62E-04	6.87E-04	2.04E-03	4.62E-03	7.46E-03	8.15E-03	7.80E-03	7.20E-03	7.05E-03	4.78E-03	4.54E-03	4.73E-03	5.01E-03	5.18E-03	5.56E-03	5.80E-03	5.48E-03	4.65E-03	3.98E-03	3.78E-03	3.23E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0027***	***0.0035***	***0.0033***	***0.0031***	***0.0030***	***0.0025***	***0.0024***	***0.0025***	***0.0026***	***0.0027***	***0.0029***	***0.0030***	***0.0029***	***0.0024***	***0.0020***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.56E-04	4.90E-04	3.50E-04	2.72E-04	2.34E-04	4.18E-04	9.14E-04	1.77E-03	2.30E-03	2.22E-03	2.05E-03	1.99E-03	1.66E-03	1.57E-03	1.65E-03	1.74E-03	1.79E-03	1.92E-03	2.02E-03	1.93E-03	1.61E-03	1.34E-03	1.26E-03	1.10E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.28E-04	2.45E-04	1.75E-04	1.36E-04	1.17E-04	2.09E-04	4.57E-04	8.86E-04	1.15E-03	1.11E-03	1.02E-03	9.93E-04	8.32E-04	7.84E-04	8.26E-04	8.69E-04	8.94E-04	9.60E-04	1.01E-03	9.67E-04	8.05E-04	6.68E-04	6.30E-04	5.50E-04
	Emission in each Box of 1st jet	g/s	3.28E-04	2.45E-04	1.75E-04	1.36E-04	1.17E-04	2.09E-04	4.57E-04	8.86E-04	1.15E-03	1.11E-03	1.02E-03	9.93E-04	8.32E-04	7.84E-04	8.26E-04	8.69E-04	8.94E-04	9.60E-04	1.01E-03	9.67E-04	8.05E-04	6.68E-04	6.30E-04	5.50E-04
	Emission in each Box of 2nd jet	g/s	3.28E-04	2.45E-04	1.75E-04	1.36E-04	1.17E-04	2.09E-04	4.57E-04	8.86E-04	1.15E-03	1.11E-03	1.02E-03	9.93E-04	8.32E-04	7.84E-04	8.26E-04	8.69E-04	8.94E-04	9.60E-04	1.01E-03	9.67E-04	8.05E-04	6.68E-04	6.30E-04	5.50E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1692	0.1279	0.1333	0.1447	0.1560	0.3640	0.3928	0.2768	0.2052	0.2036	0.2071	0.2094	0.1520	0.1547	0.1503	0.1515	0.1510	0.1482	0.1442	0.1399	0.1437	0.1498	0.1488	0.1414
	NO2	g/vehicle/km	0.0257	0.0241	0.0251	0.0262	0.0268	0.0376	0.0390	0.0330	0.0291	0.0290	0.0296	0.0296	0.0266	0.0268	0.0264	0.0264	0.0262	0.0258	0.0253	0.0249	0.0251	0.0254	0.0251	0.0243
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0060***	***0.0037***	***0.0027***	***0.0021***	***0.0019***	***0.0058***	***0.0134***	***0.0224***	***0.0243***	***0.0234***	***0.0219***	***0.0212***	***0.0141***	***0.0135***	***0.0139***	***0.0147***	***0.0153***	***0.0162***	***0.0166***	***0.0155***	***0.0130***	***0.0111***	***0.0103***	***0.0087***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.00E-03	2.44E-03	1.77E-03	1.43E-03	1.29E-03	3.87E-03	8.94E-03	1.49E-02	1.62E-02	1.56E-02	1.46E-02	1.41E-02	9.42E-03	8.97E-03	9.25E-03	9.80E-03	1.02E-02	1.08E-02	1.11E-02	1.03E-02	8.68E-03	7.41E-03	6.89E-03	5.78E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.00E-03	1.22E-03	8.84E-04	7.14E-04	6.45E-04	1.94E-03	4.47E-03	7.46E-03	8.10E-03	7.79E-03	7.30E-03	7.07E-03	4.71E-03	4.49E-03	4.63E-03	4.90E-03	5.09E-03	5.38E-03	5.53E-03	5.16E-03	4.34E-03	3.71E-03	3.44E-03	2.89E-03
	Emission in each Box of 1st jet	g/s	2.00E-03	1.22E-03	8.84E-04	7.14E-04	6.45E-04	1.94E-03	4.47E-03	7.46E-03	8.10E-03	7.79E-03	7.30E-03	7.07E-03	4.71E-03	4.49E-03	4.63E-03	4.90E-03	5.09E-03	5.38E-03	5.53E-03	5.16E-03	4.34E-03	3.71E-03	3.44E-03	2.89E-03
	Emission in each Box of 2nd jet	g/s	2.00E-03	1.22E-03	8.84E-04	7.14E-04	6.45E-04	1.94E-03	4.47E-03	7.46E-03	8.10E-03	7.79E-03	7.30E-03	7.07E-03	4.71E-03	4.49E-03	4.63E-03	4.90E-03	5.09E-03	5.38E-03	5.53E-03	5.16E-03	4.34E-03	3.71E-03	3.44E-03	2.89E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0027***	***0.0034***	***0.0033***	***0.0031***	***0.0030***	***0.0025***	***0.0023***	***0.0024***	***0.0026***	***0.0026***	***0.0028***	***0.0029***	***0.0028***	***0.0023***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.08E-04	4.60E-04	3.32E-04	2.58E-04	2.22E-04	4.00E-04	8.87E-04	1.78E-03	2.30E-03	2.22E-03	2.08E-03	2.00E-03	1.65E-03	1.56E-03	1.62E-03	1.71E-03	1.76E-03	1.87E-03	1.94E-03	1.84E-03	1.52E-03	1.26E-03	1.16E-03	9.94E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.04E-04	2.30E-04	1.66E-04	1.29E-04	1.11E-04	2.00E-04	4.44E-04	8.88E-04	1.15E-03	1.11E-03	1.04E-03	9.98E-04	8.24E-04	7.79E-04	8.12E-04	8.55E-04	8.82E-04	9.36E-04	9.69E-04	9.18E-04	7.58E-04	6.28E-04	5.80E-04	4.97E-04
	Emission in each Box of 1st jet	g/s	3.04E-04	2.30E-04	1.66E-04	1.29E-04	1.11E-04	2.00E-04	4.44E-04	8.88E-04	1.15E-03	1.11E-03	1.04E-03	9.98E-04	8.24E-04	7.79E-04	8.12E-04	8.55E-04	8.82E-04	9.36E-04	9.69E-04	9.18E-04	7.58E-04	6.28E-04	5.80E-04	4.97E-04
	Emission in each Box of 2nd jet	g/s	3.04E-04	2.30E-04	1.66E-04	1.29E-04	1.11E-04	2.00E-04	4.44E-04	8.88E-04	1.15E-03	1.11E-03	1.04E-03	9.98E-04	8.24E-04	7.79E-04	8.12E-04	8.55E-04	8.82E-04	9.36E-04	9.69E-04	9.18E-04	7.58E-04	6.28E-04	5.80E-04	4.97E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1629	0.1190	0.1221	0.1309	0.1407	0.3281	0.3489	0.2382	0.1810	0.1794	0.1847	0.1892	0.1394	0.1386	0.1383	0.1379	0.1352	0.1321	0.1291	0.1269	0.1317	0.1405	0.1407	0.1351
	NO2	g/vehicle/km	0.0248	0.0227	0.0232	0.0240	0.0245	0.0341	0.0349	0.0286	0.0259	0.0259	0.0266	0.0269	0.0245	0.0242	0.0244	0.0242	0.0236	0.0232	0.0228	0.0228	0.0232	0.0239	0.0238	0.0234
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0058***	***0.0034***	***0.0024***	***0.0019***	***0.0017***	***0.0052***	***0.0119***	***0.0192***	***0.0214***	***0.0206***	***0.0195***	***0.0192***	***0.0130***	***0.0121***	***0.0128***	***0.0134***	***0.0137***	***0.0144***	***0.0149***	***0.0140***	***0.0119***	***0.0104***	***0.0098***	***0.0083***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.85E-03	2.27E-03	1.62E-03	1.29E-03	1.16E-03	3.49E-03	7.94E-03	1.28E-02	1.43E-02	1.37E-02	1.30E-02	1.28E-02	8.64E-03	8.04E-03	8.51E-03	8.91E-03	9.11E-03	9.60E-03	9.91E-03	9.36E-03	7.95E-03	6.95E-03	6.51E-03	5.52E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.93E-03	1.14E-03	8.09E-04	6.46E-04	5.82E-04	1.75E-03	3.97E-03	6.42E-03	7.15E-03	6.87E-03	6.51E-03	6.39E-03	4.32E-03	4.02E-03	4.26E-03	4.46E-03	4.55E-03	4.80E-03	4.95E-03	4.68E-03	3.98E-03	3.47E-03	3.26E-03	2.76E-03
	Emission in each Box of 1st jet	g/s	1.93E-03	1.14E-03	8.09E-04	6.46E-04	5.82E-04	1.75E-03	3.97E-03	6.42E-03	7.15E-03	6.87E-03	6.51E-03	6.39E-03	4.32E-03	4.02E-03	4.26E-03	4.46E-03	4.55E-03	4.80E-03	4.95E-03	4.68E-03	3.98E-03	3.47E-03	3.26E-03	2.76E-03
	Emission in each Box of 2nd jet	g/s	1.93E-03	1.14E-03	8.09E-04	6.46E-04	5.82E-04	1.75E-03	3.97E-03	6.42E-03	7.15E-03	6.87E-03	6.51E-03	6.39E-03	4.32E-03	4.02E-03	4.26E-03	4.46E-03	4.55E-03	4.80E-03	4.95E-03	4.68E-03	3.98E-03	3.47E-03	3.26E-03	2.76E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0012***	***0.0023***	***0.0031***	***0.0030***	***0.0028***	***0.0027***	***0.0023***	***0.0021***	***0.0023***	***0.0023***	***0.0024***	***0.0025***	***0.0026***	***0.0025***	***0.0021***	***0.0018***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.87E-04	4.33E-04	3.08E-04	2.37E-04	2.03E-04	3.63E-04	7.94E-04	1.54E-03	2.05E-03	1.98E-03	1.87E-03	1.82E-03	1.52E-03	1.41E-03	1.50E-03	1.56E-03	1.59E-03	1.68E-03	1.75E-03	1.68E-03	1.40E-03	1.18E-03	1.10E-03	9.54E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.94E-04	2.16E-04	1.54E-04	1.18E-04	1.01E-04	1.81E-04	3.97E-04	7.71E-04	1.02E-03	9.90E-04	9.37E-04	9.08E-04	7.60E-04	7.03E-04	7.51E-04	7.82E-04	7.97E-04	8.42E-04	8.75E-04	8.41E-04	7.01E-04	5.92E-04	5.52E-04	4.77E-04
	Emission in each Box of 1st jet	g/s	2.94E-04	2.16E-04	1.54E-04	1.18E-04	1.01E-04	1.81E-04	3.97E-04	7.71E-04	1.02E-03	9.90E-04	9.37E-04	9.08E-04	7.60E-04	7.03E-04	7.51E-04	7.82E-04	7.97E-04	8.42E-04	8.75E-04	8.41E-04	7.01E-04	5.92E-04	5.52E-04	4.77E-04
	Emission in each Box of 2nd jet	g/s	2.94E-04	2.16E-04	1.54E-04	1.18E-04	1.01E-04	1.81E-04	3.97E-04	7.71E-04	1.02E-03	9.90E-04	9.37E-04	9.08E-04	7.60E-04	7.03E-04	7.51E-04	7.82E-04	7.97E-04	8.42E-04	8.75E-04	8.41E-04	7.01E-04	5.92E-04	5.52E-04	4.77E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																								
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1484	0.1126	0.1188	0.1262	0.1352	0.3134	0.3332	0.2345	0.1803	0.1767	0.1814	0.1825	0.1343	0.1390	0.1369	0.1376	0.1342	0.1339	0.1340	0.1290	0.1334	0.1408	0.1394	0.1369
	NO2	g/vehicle/km	0.0228	0.0216	0.0227	0.0232	0.0237	0.0326	0.0334	0.0282	0.0258	0.0255	0.0261	0.0260	0.0237	0.0243	0.0242	0.0242	0.0235	0.0234	0.0236	0.0231	0.0235	0.0240	0.0237	0.0237
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0053***	***0.0032***	***0.0024***	***0.0019***	***0.0017***	***0.0050***	***0.0114***	***0.0190***	***0.0214***	***0.0203***	***0.0192***	***0.0185***	***0.0125***	***0.0121***	***0.0126***	***0.0133***	***0.0136***	***0.0146***	***0.0154***	***0.0143***	***0.0121***	***0.0104***	***0.0097***	***0.0084***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.51E-03	2.15E-03	1.58E-03	1.25E-03	1.12E-03	3.34E-03	7.58E-03	1.26E-02	1.42E-02	1.35E-02	1.28E-02	1.23E-02	8.33E-03	8.06E-03	8.42E-03	8.89E-03	9.04E-03	9.73E-03	1.03E-02	9.51E-03	8.06E-03	6.97E-03	6.45E-03	5.59E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.76E-03	1.07E-03	7.88E-04	6.23E-04	5.59E-04	1.67E-03	3.79E-03	6.32E-03	7.12E-03	6.76E-03	6.39E-03	6.16E-03	4.16E-03	4.03E-03	4.21E-03	4.45E-03	4.52E-03	4.87E-03	5.14E-03	4.75E-03	4.03E-03	3.48E-03	3.23E-03	2.80E-03
	Emission in each Box of 1st jet	g/s	1.76E-03	1.07E-03	7.88E-04	6.23E-04	5.59E-04	1.67E-03	3.79E-03	6.32E-03	7.12E-03	6.76E-03	6.39E-03	6.16E-03	4.16E-03	4.03E-03	4.21E-03	4.45E-03	4.52E-03	4.87E-03	5.14E-03	4.75E-03	4.03E-03	3.48E-03	3.23E-03	2.80E-03
	Emission in each Box of 2nd jet	g/s	1.76E-03	1.07E-03	7.88E-04	6.23E-04	5.59E-04	1.67E-03	3.79E-03	6.32E-03	7.12E-03	6.76E-03	6.39E-03	6.16E-03	4.16E-03	4.03E-03	4.21E-03	4.45E-03	4.52E-03	4.87E-03	5.14E-03	4.75E-03	4.03E-03	3.48E-03	3.23E-03	2.80E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0005***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0023***	***0.0031***	***0.0029***	***0.0028***	***0.0026***	***0.0022***	***0.0021***	***0.0022***	***0.0023***	***0.0024***	***0.0026***	***0.0027***	***0.0026***	***0.0021***	***0.0018***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.38E-04	4.12E-04	3.01E-04	2.29E-04	1.96E-04	3.47E-04	7.59E-04	1.52E-03	2.04E-03	1.95E-03	1.84E-03	1.76E-03	1.47E-03	1.41E-03	1.49E-03	1.56E-03	1.58E-03	1.70E-03	1.81E-03	1.71E-03	1.42E-03	1.19E-03	1.10E-03	9.66E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.69E-04	2.06E-04	1.50E-04	1.15E-04	9.80E-05	1.74E-04	3.80E-04	7.61E-04	1.02E-03	9.76E-04	9.21E-04	8.78E-04	7.36E-04	7.05E-04	7.44E-04	7.81E-04	7.91E-04	8.51E-04	9.05E-04	8.53E-04	7.09E-04	5.94E-04	5.48E-04	4.83E-04
	Emission in each Box of 1st jet	g/s	2.69E-04	2.06E-04	1.50E-04	1.15E-04	9.80E-05	1.74E-04	3.80E-04	7.61E-04	1.02E-03	9.76E-04	9.21E-04	8.78E-04	7.36E-04	7.05E-04	7.44E-04	7.81E-04	7.91E-04	8.51E-04	9.05E-04	8.53E-04	7.09E-04	5.94E-04	5.48E-04	4.83E-04
	Emission in each Box of 2nd jet	g/s	2.69E-04	2.06E-04	1.50E-04	1.15E-04	9.80E-05	1.74E-04	3.80E-04	7.61E-04	1.02E-03	9.76E-04	9.21E-04	8.78E-04	7.36E-04	7.05E-04	7.44E-04	7.81E-04	7.91E-04	8.51E-04	9.05E-04	8.53E-04	7.09E-04	5.94E-04	5.48E-04	4.83E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1451	0.1086	0.1139	0.1207	0.1274	0.3053	0.3201	0.2239	0.1708	0.1768	0.1843	0.1915	0.1394	0.1412	0.1397	0.1415	0.1330	0.1321	0.1296	0.1238	0.1247	0.1317	0.1307	0.1246
	NO2	g/vehicle/km	0.0223	0.0208	0.0218	0.0223	0.0224	0.0319	0.0321	0.0270	0.0246	0.0255	0.0265	0.0272	0.0245	0.0247	0.0246	0.0248	0.0233	0.0232	0.0229	0.0223	0.0220	0.0225	0.0222	0.0216
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0051***	***0.0031***	***0.0023***	***0.0018***	***0.0016***	***0.0049***	***0.0109***	***0.0181***	***0.0202***	***0.0203***	***0.0195***	***0.0194***	***0.0130***	***0.0123***	***0.0129***	***0.0137***	***0.0134***	***0.0144***	***0.0149***	***0.0137***	***0.0113***	***0.0098***	***0.0091***	***0.0076***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.43E-03	2.07E-03	1.51E-03	1.19E-03	1.05E-03	3.25E-03	7.28E-03	1.21E-02	1.35E-02	1.35E-02	1.30E-02	1.29E-02	8.64E-03	8.19E-03	8.60E-03	9.15E-03	8.96E-03	9.60E-03	9.94E-03	9.13E-03	7.53E-03	6.52E-03	6.05E-03	5.09E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.72E-03	1.04E-03	7.55E-04	5.96E-04	5.27E-04	1.62E-03	3.64E-03	6.03E-03	6.74E-03	6.77E-03	6.50E-03	6.47E-03	4.32E-03	4.10E-03	4.30E-03	4.57E-03	4.48E-03	4.80E-03	4.97E-03	4.56E-03	3.76E-03	3.26E-03	3.03E-03	2.54E-03
	Emission in each Box of 1st jet	g/s	1.72E-03	1.04E-03	7.55E-04	5.96E-04	5.27E-04	1.62E-03	3.64E-03	6.03E-03	6.74E-03	6.77E-03	6.50E-03	6.47E-03	4.32E-03	4.10E-03	4.30E-03	4.57E-03	4.48E-03	4.80E-03	4.97E-03	4.56E-03	3.76E-03	3.26E-03	3.03E-03	2.54E-03
	Emission in each Box of 2nd jet	g/s	1.72E-03	1.04E-03	7.55E-04	5.96E-04	5.27E-04	1.62E-03	3.64E-03	6.03E-03	6.74E-03	6.77E-03	6.50E-03	6.47E-03	4.32E-03	4.10E-03	4.30E-03	4.57E-03	4.48E-03	4.80E-03	4.97E-03	4.56E-03	3.76E-03	3.26E-03	3.03E-03	2.54E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0022***	***0.0029***	***0.0029***	***0.0028***	***0.0028***	***0.0023***	***0.0021***	***0.0023***	***0.0024***	***0.0024***	***0.0025***	***0.0026***	***0.0025***	***0.0020***	***0.0017***	***0.0015***	***0.0013***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.27E-04	3.98E-04	2.88E-04	2.20E-04	1.86E-04	3.39E-04	7.31E-04	1.45E-03	1.94E-03	1.95E-03	1.87E-03	1.84E-03	1.52E-03	1.43E-03	1.52E-03	1.60E-03	1.57E-03	1.68E-03	1.76E-03	1.64E-03	1.33E-03	1.11E-03	1.03E-03	8.84E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.64E-04	1.99E-04	1.44E-04	1.10E-04	9.28E-05	1.70E-04	3.66E-04	7.26E-04	9.70E-04	9.76E-04	9.35E-04	9.18E-04	7.60E-04	7.15E-04	7.58E-04	8.02E-04	7.85E-04	8.42E-04	8.78E-04	8.22E-04	6.64E-04	5.57E-04	5.15E-04	4.42E-04
	Emission in each Box of 1st jet	g/s	2.64E-04	1.99E-04	1.44E-04	1.10E-04	9.28E-05	1.70E-04	3.66E-04	7.26E-04	9.70E-04	9.76E-04	9.35E-04	9.18E-04	7.60E-04	7.15E-04	7.58E-04	8.02E-04	7.85E-04	8.42E-04	8.78E-04	8.22E-04	6.64E-04	5.57E-04	5.15E-04	4.42E-04
	Emission in each Box of 2nd jet	g/s	2.64E-04	1.99E-04	1.44E-04	1.10E-04	9.28E-05	1.70E-04	3.66E-04	7.26E-04	9.70E-04	9.76E-04	9.35E-04	9.18E-04	7.60E-04	7.15E-04	7.58E-04	8.02E-04	7.85E-04	8.42E-04	8.78E-04	8.22E-04	6.64E-04	5.57E-04	5.15E-04	4.42E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1534	0.1117	0.1178	0.1273	0.1352	0.3121	0.3318	0.2229	0.1724	0.1733	0.1802	0.1833	0.1355	0.1410	0.1398	0.1395	0.1421	0.1385	0.1370	0.1311	0.1307	0.1337	0.1356	0.1311
	NO2	g/vehicle/km	0.0235	0.0214	0.0225	0.0234	0.0237	0.0325	0.0332	0.0269	0.0248	0.0250	0.0260	0.0261	0.0239	0.0246	0.0247	0.0245	0.0248	0.0242	0.0241	0.0235	0.0230	0.0229	0.0231	0.0227
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0054***	***0.0032***	***0.0023***	***0.0019***	***0.0017***	***0.0050***	***0.0113***	***0.0180***	***0.0204***	***0.0199***	***0.0191***	***0.0186***	***0.0126***	***0.0123***	***0.0129***	***0.0135***	***0.0144***	***0.0151***	***0.0158***	***0.0145***	***0.0118***	***0.0099***	***0.0094***	***0.0080***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.63E-03	2.13E-03	1.56E-03	1.26E-03	1.12E-03	3.32E-03	7.55E-03	1.20E-02	1.36E-02	1.33E-02	1.27E-02	1.24E-02	8.40E-03	8.18E-03	8.61E-03	9.02E-03	9.58E-03	1.01E-02	1.05E-02	9.67E-03	7.89E-03	6.61E-03	6.28E-03	5.35E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.81E-03	1.07E-03	7.81E-04	6.29E-04	5.59E-04	1.66E-03	3.78E-03	6.00E-03	6.81E-03	6.63E-03	6.35E-03	6.19E-03	4.20E-03	4.09E-03	4.30E-03	4.51E-03	4.79E-03	5.03E-03	5.26E-03	4.83E-03	3.95E-03	3.31E-03	3.14E-03	2.68E-03
	Emission in each Box of 1st jet	g/s	1.81E-03	1.07E-03	7.81E-04	6.29E-04	5.59E-04	1.66E-03	3.78E-03	6.00E-03	6.81E-03	6.63E-03	6.35E-03	6.19E-03	4.20E-03	4.09E-03	4.30E-03	4.51E-03	4.79E-03	5.03E-03	5.26E-03	4.83E-03	3.95E-03	3.31E-03	3.14E-03	2.68E-03
	Emission in each Box of 2nd jet	g/s	1.81E-03	1.07E-03	7.81E-04	6.29E-04	5.59E-04	1.66E-03	3.78E-03	6.00E-03	6.81E-03	6.63E-03	6.35E-03	6.19E-03	4.20E-03	4.09E-03	4.30E-03	4.51E-03	4.79E-03	5.03E-03	5.26E-03	4.83E-03	3.95E-03	3.31E-03	3.14E-03	2.68E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0022***	***0.0029***	***0.0029***	***0.0027***	***0.0026***	***0.0022***	***0.0021***	***0.0023***	***0.0024***	***0.0025***	***0.0026***	***0.0028***	***0.0026***	***0.0021***	***0.0017***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.57E-04	4.08E-04	2.98E-04	2.31E-04	1.96E-04	3.46E-04	7.56E-04	1.45E-03	1.96E-03	1.92E-03	1.83E-03	1.76E-03	1.48E-03	1.43E-03	1.52E-03	1.58E-03	1.67E-03	1.76E-03	1.85E-03	1.73E-03	1.39E-03	1.13E-03	1.07E-03	9.29E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.78E-04	2.04E-04	1.49E-04	1.16E-04	9.80E-05	1.73E-04	3.78E-04	7.23E-04	9.79E-04	9.58E-04	9.16E-04	8.82E-04	7.41E-04	7.14E-04	7.59E-04	7.92E-04	8.34E-04	8.79E-04	9.24E-04	8.66E-04	6.96E-04	5.66E-04	5.34E-04	4.64E-04
	Emission in each Box of 1st jet	g/s	2.78E-04	2.04E-04	1.49E-04	1.16E-04	9.80E-05	1.73E-04	3.78E-04	7.23E-04	9.79E-04	9.58E-04	9.16E-04	8.82E-04	7.41E-04	7.14E-04	7.59E-04	7.92E-04	8.34E-04	8.79E-04	9.24E-04	8.66E-04	6.96E-04	5.66E-04	5.34E-04	4.64E-04
	Emission in each Box of 2nd jet	g/s	2.78E-04	2.04E-04	1.49E-04	1.16E-04	9.80E-05	1.73E-04	3.78E-04	7.23E-04	9.79E-04	9.58E-04	9.16E-04	8.82E-04	7.41E-04	7.14E-04	7.59E-04	7.92E-04	8.34E-04	8.79E-04	9.24E-04	8.66E-04	6.96E-04	5.66E-04	5.34E-04	4.64E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1523	0.1142	0.1162	0.1220	0.1345	0.3039	0.3246	0.2191	0.1651	0.1655	0.1786	0.1749	0.1332	0.1370	0.1389	0.1322	0.1277	0.1309	0.1307	0.1251	0.1306	0.1350	0.1352	0.1296
	NO2	g/vehicle/km	0.0234	0.0218	0.0222	0.0225	0.0236	0.0317	0.0326	0.0264	0.0237	0.0240	0.0258	0.0250	0.0235	0.0240	0.0245	0.0233	0.0224	0.0230	0.0231	0.0225	0.0230	0.0231	0.0230	0.0225
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0054***	***0.0033***	***0.0023***	***0.0018***	***0.0017***	***0.0049***	***0.0111***	***0.0177***	***0.0196***	***0.0190***	***0.0189***	***0.0177***	***0.0124***	***0.0119***	***0.0128***	***0.0128***	***0.0129***	***0.0143***	***0.0151***	***0.0138***	***0.0118***	***0.0100***	***0.0094***	***0.0079***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.60E-03	2.18E-03	1.54E-03	1.20E-03	1.11E-03	3.23E-03	7.39E-03	1.18E-02	1.30E-02	1.27E-02	1.26E-02	1.18E-02	8.26E-03	7.95E-03	8.55E-03	8.55E-03	8.60E-03	9.51E-03	1.00E-02	9.22E-03	7.89E-03	6.68E-03	6.26E-03	5.29E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.80E-03	1.09E-03	7.70E-04	6.02E-04	5.56E-04	1.62E-03	3.69E-03	5.90E-03	6.52E-03	6.33E-03	6.29E-03	5.91E-03	4.13E-03	3.97E-03	4.27E-03	4.27E-03	4.30E-03	4.76E-03	5.02E-03	4.61E-03	3.94E-03	3.34E-03	3.13E-03	2.65E-03
	Emission in each Box of 1st jet	g/s	1.80E-03	1.09E-03	7.70E-04	6.02E-04	5.56E-04	1.62E-03	3.69E-03	5.90E-03	6.52E-03	6.33E-03	6.29E-03	5.91E-03	4.13E-03	3.97E-03	4.27E-03	4.27E-03	4.30E-03	4.76E-03	5.02E-03	4.61E-03	3.94E-03	3.34E-03	3.13E-03	2.65E-03
	Emission in each Box of 2nd jet	g/s	1.80E-03	1.09E-03	7.70E-04	6.02E-04	5.56E-04	1.62E-03	3.69E-03	5.90E-03	6.52E-03	6.33E-03	6.29E-03	5.91E-03	4.13E-03	3.97E-03	4.27E-03	4.27E-03	4.30E-03	4.76E-03	5.02E-03	4.61E-03	3.94E-03	3.34E-03	3.13E-03	2.65E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0021***	***0.0028***	***0.0028***	***0.0027***	***0.0025***	***0.0022***	***0.0021***	***0.0023***	***0.0023***	***0.0023***	***0.0025***	***0.0027***	***0.0025***	***0.0021***	***0.0017***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.53E-04	4.17E-04	2.94E-04	2.22E-04	1.95E-04	3.38E-04	7.41E-04	1.42E-03	1.87E-03	1.84E-03	1.82E-03	1.69E-03	1.46E-03	1.39E-03	1.51E-03	1.51E-03	1.51E-03	1.67E-03	1.77E-03	1.66E-03	1.39E-03	1.14E-03	1.06E-03	9.19E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.76E-04	2.09E-04	1.47E-04	1.11E-04	9.75E-05	1.69E-04	3.70E-04	7.12E-04	9.37E-04	9.18E-04	9.08E-04	8.44E-04	7.29E-04	6.95E-04	7.54E-04	7.53E-04	7.55E-04	8.35E-04	8.85E-04	8.30E-04	6.95E-04	5.71E-04	5.32E-04	4.60E-04
	Emission in each Box of 1st jet	g/s	2.76E-04	2.09E-04	1.47E-04	1.11E-04	9.75E-05	1.69E-04	3.70E-04	7.12E-04	9.37E-04	9.18E-04	9.08E-04	8.44E-04	7.29E-04	6.95E-04	7.54E-04	7.53E-04	7.55E-04	8.35E-04	8.85E-04	8.30E-04	6.95E-04	5.71E-04	5.32E-04	4.60E-04
	Emission in each Box of 2nd jet	g/s	2.76E-04	2.09E-04	1.47E-04	1.11E-04	9.75E-05	1.69E-04	3.70E-04	7.12E-04	9.37E-04	9.18E-04	9.08E-04	8.44E-04	7.29E-04	6.95E-04	7.54E-04	7.53E-04	7.55E-04	8.35E-04	8.85E-04	8.30E-04	6.95E-04	5.71E-04	5.32E-04	4.60E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1735	0.1323	0.1355	0.1447	0.1561	0.3661	0.3871	0.2618	0.1971	0.1953	0.2000	0.2052	0.1526	0.1534	0.1499	0.1526	0.1478	0.1475	0.1472	0.1419	0.1473	0.1522	0.1539	0.1502
	NO2	g/vehicle/km	0.0263	0.0248	0.0254	0.0261	0.0268	0.0377	0.0384	0.0312	0.0280	0.0279	0.0286	0.0290	0.0267	0.0266	0.0263	0.0266	0.0256	0.0256	0.0257	0.0253	0.0257	0.0258	0.0259	0.0257
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0062***	***0.0038***	***0.0027***	***0.0021***	***0.0019***	***0.0058***	***0.0132***	***0.0212***	***0.0233***	***0.0224***	***0.0211***	***0.0208***	***0.0142***	***0.0133***	***0.0138***	***0.0148***	***0.0149***	***0.0161***	***0.0170***	***0.0157***	***0.0133***	***0.0113***	***0.0107***	***0.0092***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.11E-03	2.53E-03	1.80E-03	1.43E-03	1.29E-03	3.90E-03	8.81E-03	1.41E-02	1.56E-02	1.49E-02	1.41E-02	1.39E-02	9.46E-03	8.90E-03	9.23E-03	9.87E-03	9.96E-03	1.07E-02	1.13E-02	1.05E-02	8.90E-03	7.53E-03	7.13E-03	6.14E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.05E-03	1.26E-03	8.98E-04	7.14E-04	6.46E-04	1.95E-03	4.40E-03	7.05E-03	7.78E-03	7.47E-03	7.05E-03	6.93E-03	4.73E-03	4.45E-03	4.62E-03	4.93E-03	4.98E-03	5.36E-03	5.65E-03	5.23E-03	4.45E-03	3.76E-03	3.56E-03	3.07E-03
	Emission in each Box of 1st jet	g/s	2.05E-03	1.26E-03	8.98E-04	7.14E-04	6.46E-04	1.95E-03	4.40E-03	7.05E-03	7.78E-03	7.47E-03	7.05E-03	6.93E-03	4.73E-03	4.45E-03	4.62E-03	4.93E-03	4.98E-03	5.36E-03	5.65E-03	5.23E-03	4.45E-03	3.76E-03	3.56E-03	3.07E-03
	Emission in each Box of 2nd jet	g/s	2.05E-03	1.26E-03	8.98E-04	7.14E-04	6.46E-04	1.95E-03	4.40E-03	7.05E-03	7.78E-03	7.47E-03	7.05E-03	6.93E-03	4.73E-03	4.45E-03	4.62E-03	4.93E-03	4.98E-03	5.36E-03	5.65E-03	5.23E-03	4.45E-03	3.76E-03	3.56E-03	3.07E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0025***	***0.0033***	***0.0032***	***0.0030***	***0.0029***	***0.0025***	***0.0023***	***0.0024***	***0.0026***	***0.0026***	***0.0028***	***0.0030***	***0.0028***	***0.0023***	***0.0019***	***0.0018***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.23E-04	4.74E-04	3.37E-04	2.58E-04	2.22E-04	4.01E-04	8.75E-04	1.68E-03	2.21E-03	2.14E-03	2.02E-03	1.96E-03	1.65E-03	1.54E-03	1.62E-03	1.72E-03	1.73E-03	1.86E-03	1.97E-03	1.86E-03	1.55E-03	1.27E-03	1.20E-03	1.05E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.11E-04	2.37E-04	1.68E-04	1.29E-04	1.11E-04	2.01E-04	4.37E-04	8.42E-04	1.11E-03	1.07E-03	1.01E-03	9.79E-04	8.26E-04	7.72E-04	8.09E-04	8.59E-04	8.64E-04	9.30E-04	9.85E-04	9.32E-04	7.75E-04	6.37E-04	5.99E-04	5.25E-04
	Emission in each Box of 1st jet	g/s	3.11E-04	2.37E-04	1.68E-04	1.29E-04	1.11E-04	2.01E-04	4.37E-04	8.42E-04	1.11E-03	1.07E-03	1.01E-03	9.79E-04	8.26E-04	7.72E-04	8.09E-04	8.59E-04	8.64E-04	9.30E-04	9.85E-04	9.32E-04	7.75E-04	6.37E-04	5.99E-04	5.25E-04
	Emission in each Box of 2nd jet	g/s	3.11E-04	2.37E-04	1.68E-04	1.29E-04	1.11E-04	2.01E-04	4.37E-04	8.42E-04	1.11E-03	1.07E-03	1.01E-03	9.79E-04	8.26E-04	7.72E-04	8.09E-04	8.59E-04	8.64E-04	9.30E-04	9.85E-04	9.32E-04	7.75E-04	6.37E-04	5.99E-04	5.25E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1899	0.1422	0.1479	0.1588	0.1709	0.3960	0.4228	0.2831	0.2134	0.2107	0.2165	0.2189	0.1640	0.1664	0.1634	0.1635	0.1589	0.1577	0.1572	0.1544	0.1582	0.1665	0.1674	0.1625
	NO2	g/vehicle/km	0.0286	0.0265	0.0274	0.0283	0.0290	0.0406	0.0418	0.0337	0.0301	0.0299	0.0307	0.0307	0.0284	0.0286	0.0284	0.0283	0.0274	0.0271	0.0272	0.0272	0.0274	0.0279	0.0279	0.0276
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0067***	***0.0041***	***0.0029***	***0.0024***	***0.0021***	***0.0063***	***0.0144***	***0.0229***	***0.0253***	***0.0242***	***0.0229***	***0.0222***	***0.0153***	***0.0145***	***0.0151***	***0.0159***	***0.0161***	***0.0172***	***0.0181***	***0.0171***	***0.0143***	***0.0124***	***0.0116***	***0.0100***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.49E-03	2.71E-03	1.96E-03	1.57E-03	1.41E-03	4.22E-03	9.62E-03	1.53E-02	1.69E-02	1.61E-02	1.53E-02	1.48E-02	1.02E-02	9.65E-03	1.01E-02	1.06E-02	1.07E-02	1.15E-02	1.21E-02	1.14E-02	9.55E-03	8.24E-03	7.75E-03	6.64E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.25E-03	1.36E-03	9.80E-04	7.84E-04	7.07E-04	2.11E-03	4.81E-03	7.63E-03	8.43E-03	8.07E-03	7.63E-03	7.39E-03	5.08E-03	4.83E-03	5.03E-03	5.29E-03	5.35E-03	5.73E-03	6.03E-03	5.69E-03	4.78E-03	4.12E-03	3.88E-03	3.32E-03
	Emission in each Box of 1st jet	g/s	2.25E-03	1.36E-03	9.80E-04	7.84E-04	7.07E-04	2.11E-03	4.81E-03	7.63E-03	8.43E-03	8.07E-03	7.63E-03	7.39E-03	5.08E-03	4.83E-03	5.03E-03	5.29E-03	5.35E-03	5.73E-03	6.03E-03	5.69E-03	4.78E-03	4.12E-03	3.88E-03	3.32E-03
	Emission in each Box of 2nd jet	g/s	2.25E-03	1.36E-03	9.80E-04	7.84E-04	7.07E-04	2.11E-03	4.81E-03	7.63E-03	8.43E-03	8.07E-03	7.63E-03	7.39E-03	5.08E-03	4.83E-03	5.03E-03	5.29E-03	5.35E-03	5.73E-03	6.03E-03	5.69E-03	4.78E-03	4.12E-03	3.88E-03	3.32E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0014***	***0.0027***	***0.0036***	***0.0034***	***0.0032***	***0.0031***	***0.0026***	***0.0025***	***0.0026***	***0.0027***	***0.0028***	***0.0030***	***0.0031***	***0.0030***	***0.0025***	***0.0021***	***0.0019***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.76E-04	5.06E-04	3.63E-04	2.79E-04	2.40E-04	4.33E-04	9.51E-04	1.81E-03	2.38E-03	2.29E-03	2.17E-03	2.07E-03	1.76E-03	1.66E-03	1.75E-03	1.83E-03	1.84E-03	1.97E-03	2.09E-03	2.01E-03	1.65E-03	1.38E-03	1.29E-03	1.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.38E-04	2.53E-04	1.82E-04	1.40E-04	1.20E-04	2.16E-04	4.75E-04	9.07E-04	1.19E-03	1.15E-03	1.08E-03	1.04E-03	8.80E-04	8.28E-04	8.74E-04	9.14E-04	9.22E-04	9.85E-04	1.05E-03	1.00E-03	8.26E-04	6.91E-04	6.46E-04	5.64E-04
	Emission in each Box of 1st jet	g/s	3.38E-04	2.53E-04	1.82E-04	1.40E-04	1.20E-04	2.16E-04	4.75E-04	9.07E-04	1.19E-03	1.15E-03	1.08E-03	1.04E-03	8.80E-04	8.28E-04	8.74E-04	9.14E-04	9.22E-04	9.85E-04	1.05E-03	1.00E-03	8.26E-04	6.91E-04	6.46E-04	5.64E-04
	Emission in each Box of 2nd jet	g/s	3.38E-04	2.53E-04	1.82E-04	1.40E-04	1.20E-04	2.16E-04	4.75E-04	9.07E-04	1.19E-03	1.15E-03	1.08E-03	1.04E-03	8.80E-04	8.28E-04	8.74E-04	9.14E-04	9.22E-04	9.85E-04	1.05E-03	1.00E-03	8.26E-04	6.91E-04	6.46E-04	5.64E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1974	0.1490	0.1550	0.1667	0.1784	0.4080	0.4354	0.2933	0.2200	0.2171	0.2229	0.2270	0.1695	0.1710	0.1681	0.1687	0.1649	0.1654	0.1630	0.1600	0.1641	0.1726	0.1738	0.1694
	NO2	g/vehicle/km	0.0295	0.0274	0.0283	0.0293	0.0299	0.0417	0.0428	0.0346	0.0308	0.0306	0.0314	0.0316	0.0291	0.0292	0.0289	0.0289	0.0281	0.0282	0.0280	0.0279	0.0281	0.0287	0.0286	0.0285
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0070***	***0.0043***	***0.0031***	***0.0025***	***0.0022***	***0.0065***	***0.0149***	***0.0237***	***0.0261***	***0.0249***	***0.0236***	***0.0230***	***0.0158***	***0.0149***	***0.0155***	***0.0164***	***0.0167***	***0.0180***	***0.0188***	***0.0177***	***0.0149***	***0.0128***	***0.0121***	***0.0104***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.67E-03	2.85E-03	2.05E-03	1.65E-03	1.48E-03	4.34E-03	9.91E-03	1.58E-02	1.74E-02	1.66E-02	1.57E-02	1.53E-02	1.05E-02	9.92E-03	1.03E-02	1.09E-02	1.11E-02	1.20E-02	1.25E-02	1.18E-02	9.91E-03	8.54E-03	8.05E-03	6.92E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.33E-03	1.42E-03	1.03E-03	8.23E-04	7.38E-04	2.17E-03	4.95E-03	7.90E-03	8.69E-03	8.31E-03	7.85E-03	7.67E-03	5.25E-03	4.96E-03	5.17E-03	5.45E-03	5.56E-03	6.01E-03	6.25E-03	5.90E-03	4.95E-03	4.27E-03	4.02E-03	3.46E-03
	Emission in each Box of 1st jet	g/s	2.33E-03	1.42E-03	1.03E-03	8.23E-04	7.38E-04	2.17E-03	4.95E-03	7.90E-03	8.69E-03	8.31E-03	7.85E-03	7.67E-03	5.25E-03	4.96E-03	5.17E-03	5.45E-03	5.56E-03	6.01E-03	6.25E-03	5.90E-03	4.95E-03	4.27E-03	4.02E-03	3.46E-03
	Emission in each Box of 2nd jet	g/s	2.33E-03	1.42E-03	1.03E-03	8.23E-04	7.38E-04	2.17E-03	4.95E-03	7.90E-03	8.69E-03	8.31E-03	7.85E-03	7.67E-03	5.25E-03	4.96E-03	5.17E-03	5.45E-03	5.56E-03	6.01E-03	6.25E-03	5.90E-03	4.95E-03	4.27E-03	4.02E-03	3.46E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0007***	***0.0015***	***0.0028***	***0.0037***	***0.0035***	***0.0033***	***0.0032***	***0.0027***	***0.0025***	***0.0027***	***0.0028***	***0.0028***	***0.0031***	***0.0032***	***0.0031***	***0.0025***	***0.0021***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.97E-04	5.23E-04	3.75E-04	2.89E-04	2.48E-04	4.44E-04	9.74E-04	1.87E-03	2.44E-03	2.35E-03	2.22E-03	2.14E-03	1.80E-03	1.69E-03	1.78E-03	1.87E-03	1.90E-03	2.05E-03	2.15E-03	2.06E-03	1.70E-03	1.42E-03	1.33E-03	1.16E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.48E-04	2.61E-04	1.88E-04	1.45E-04	1.24E-04	2.22E-04	4.87E-04	9.33E-04	1.22E-03	1.17E-03	1.11E-03	1.07E-03	9.02E-04	8.46E-04	8.91E-04	9.34E-04	9.48E-04	1.02E-03	1.07E-03	1.03E-03	8.49E-04	7.09E-04	6.63E-04	5.82E-04
	Emission in each Box of 1st jet	g/s	3.48E-04	2.61E-04	1.88E-04	1.45E-04	1.24E-04	2.22E-04	4.87E-04	9.33E-04	1.22E-03	1.17E-03	1.11E-03	1.07E-03	9.02E-04	8.46E-04	8.91E-04	9.34E-04	9.48E-04	1.02E-03	1.07E-03	1.03E-03	8.49E-04	7.09E-04	6.63E-04	5.82E-04
	Emission in each Box of 2nd jet	g/s	3.48E-04	2.61E-04	1.88E-04	1.45E-04	1.24E-04	2.22E-04	4.87E-04	9.33E-04	1.22E-03	1.17E-03	1.11E-03	1.07E-03	9.02E-04	8.46E-04	8.91E-04	9.34E-04	9.48E-04	1.02E-03	1.07E-03	1.03E-03	8.49E-04	7.09E-04	6.63E-04	5.82E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1772	0.1344	0.1378	0.1533	0.1633	0.3774	0.4035	0.2685	0.2002	0.1971	0.2008	0.2059	0.1673	0.1705	0.1677	0.1673	0.1649	0.1656	0.1632	0.1588	0.1633	0.1744	0.1729	0.1667
	NO2	g/vehicle/km	0.0257	0.0240	0.0245	0.0258	0.0261	0.0378	0.0389	0.0308	0.0273	0.0271	0.0277	0.0281	0.0274	0.0276	0.0274	0.0273	0.0266	0.0266	0.0264	0.0262	0.0265	0.0271	0.0268	0.0264
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0128***	***0.0079***	***0.0056***	***0.0046***	***0.0041***	***0.0121***	***0.0277***	***0.0440***	***0.0483***	***0.0461***	***0.0433***	***0.0425***	***0.0303***	***0.0289***	***0.0301***	***0.0315***	***0.0323***	***0.0350***	***0.0365***	***0.0341***	***0.0287***	***0.0252***	***0.0233***	***0.0198***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.55E-03	5.24E-03	3.71E-03	3.09E-03	2.75E-03	8.06E-03	1.84E-02	2.93E-02	3.22E-02	3.07E-02	2.89E-02	2.84E-02	2.02E-02	1.93E-02	2.01E-02	2.10E-02	2.16E-02	2.33E-02	2.43E-02	2.27E-02	1.92E-02	1.68E-02	1.55E-02	1.32E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.27E-03	2.62E-03	1.86E-03	1.55E-03	1.38E-03	4.03E-03	9.22E-03	1.47E-02	1.61E-02	1.54E-02	1.44E-02	1.42E-02	1.01E-02	9.63E-03	1.00E-02	1.05E-02	1.08E-02	1.17E-02	1.22E-02	1.14E-02	9.58E-03	8.39E-03	7.76E-03	6.61E-03
	Emission in each Box of 1st jet	g/s	2.85E-03	1.75E-03	1.24E-03	1.03E-03	9.18E-04	2.69E-03	6.15E-03	9.77E-03	1.07E-02	1.02E-02	9.62E-03	9.45E-03	6.72E-03	6.42E-03	6.70E-03	7.01E-03	7.19E-03	7.78E-03	8.10E-03	7.57E-03	6.38E-03	5.59E-03	5.18E-03	4.40E-03
	Emission in each Box of 2nd jet	g/s	1.42E-03	8.73E-04	6.19E-04	5.16E-04	4.59E-04	1.34E-03	3.07E-03	4.88E-03	5.37E-03	5.12E-03	4.81E-03	4.73E-03	3.36E-03	3.21E-03	3.35E-03	3.50E-03	3.59E-03	3.89E-03	4.05E-03	3.78E-03	3.19E-03	2.80E-03	2.59E-03	2.20E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0012***	***0.0027***	***0.0050***	***0.0066***	***0.0063***	***0.0060***	***0.0058***	***0.0049***	***0.0047***	***0.0049***	***0.0051***	***0.0052***	***0.0056***	***0.0059***	***0.0056***	***0.0047***	***0.0039***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.24E-03	9.35E-04	6.59E-04	5.20E-04	4.39E-04	8.08E-04	1.78E-03	3.37E-03	4.39E-03	4.22E-03	3.98E-03	3.87E-03	3.30E-03	3.12E-03	3.28E-03	3.43E-03	3.48E-03	3.75E-03	3.94E-03	3.75E-03	3.11E-03	2.61E-03	2.41E-03	2.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.21E-04	4.67E-04	3.30E-04	2.60E-04	2.20E-04	4.04E-04	8.90E-04	1.68E-03	2.19E-03	2.11E-03	1.99E-03	1.94E-03	1.65E-03	1.56E-03	1.64E-03	1.71E-03	1.74E-03	1.87E-03	1.97E-03	1.88E-03	1.55E-03	1.31E-03	1.20E-03	1.05E-03
	Emission in each Box of 1st jet	g/s	4.14E-04	3.12E-04	2.20E-04	1.73E-04	1.46E-04	2.69E-04	5.93E-04	1.12E-03	1.46E-03	1.41E-03	1.33E-03	1.29E-03	1.10E-03	1.04E-03	1.09E-03	1.14E-03	1.16E-03	1.25E-03	1.31E-03	1.25E-03	1.04E-03	8.70E-04	8.03E-04	6.98E-04
	Emission in each Box of 2nd jet	g/s	2.07E-04	1.56E-04	1.10E-04	8.66E-05	7.32E-05	1.35E-04	2.97E-04	5.61E-04	7.31E-04	7.04E-04	6.64E-04	6.45E-04	5.50E-04	5.19E-04	5.47E-04	5.71E-04	5.81E-04	6.25E-04	6.56E-04	6.25E-04	5.18E-04	4.35E-04	4.02E-04	3.49E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1614	0.1213	0.1238	0.1387	0.1521	0.3579	0.3845	0.2533	0.1886	0.1883	0.1925	0.1964	0.1587	0.1598	0.1581	0.1582	0.1558	0.1546	0.1485	0.1443	0.1477	0.1584	0.1572	0.1514
	NO2	g/vehicle/km	0.0238	0.0222	0.0225	0.0238	0.0248	0.0362	0.0373	0.0294	0.0260	0.0261	0.0268	0.0271	0.0263	0.0262	0.0262	0.0261	0.0255	0.0252	0.0245	0.0243	0.0244	0.0251	0.0248	0.0244
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0117***	***0.0071***	***0.0050***	***0.0042***	***0.0038***	***0.0115***	***0.0264***	***0.0415***	***0.0455***	***0.0440***	***0.0415***	***0.0406***	***0.0287***	***0.0271***	***0.0284***	***0.0298***	***0.0306***	***0.0327***	***0.0332***	***0.0310***	***0.0260***	***0.0228***	***0.0212***	***0.0180***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.79E-03	4.73E-03	3.34E-03	2.80E-03	2.56E-03	7.65E-03	1.76E-02	2.76E-02	3.03E-02	2.94E-02	2.77E-02	2.71E-02	1.91E-02	1.80E-02	1.89E-02	1.99E-02	2.04E-02	2.18E-02	2.21E-02	2.06E-02	1.73E-02	1.52E-02	1.41E-02	1.20E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.89E-03	2.36E-03	1.67E-03	1.40E-03	1.28E-03	3.82E-03	8.79E-03	1.38E-02	1.52E-02	1.47E-02	1.38E-02	1.35E-02	9.57E-03	9.02E-03	9.47E-03	9.95E-03	1.02E-02	1.09E-02	1.11E-02	1.03E-02	8.67E-03	7.61E-03	7.06E-03	6.00E-03
	Emission in each Box of 1st jet	g/s	2.60E-03	1.58E-03	1.11E-03	9.33E-04	8.55E-04	2.55E-03	5.86E-03	9.21E-03	1.01E-02	9.79E-03	9.22E-03	9.02E-03	6.38E-03	6.01E-03	6.32E-03	6.63E-03	6.79E-03	7.26E-03	7.37E-03	6.88E-03	5.78E-03	5.08E-03	4.71E-03	4.00E-03
	Emission in each Box of 2nd jet	g/s	1.30E-03	7.88E-04	5.56E-04	4.67E-04	4.27E-04	1.27E-03	2.93E-03	4.61E-03	5.05E-03	4.89E-03	4.61E-03	4.51E-03	3.19E-03	3.01E-03	3.16E-03	3.32E-03	3.40E-03	3.63E-03	3.69E-03	3.44E-03	2.89E-03	2.54E-03	2.35E-03	2.00E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0012***	***0.0026***	***0.0048***	***0.0063***	***0.0061***	***0.0058***	***0.0056***	***0.0048***	***0.0044***	***0.0047***	***0.0049***	***0.0050***	***0.0053***	***0.0055***	***0.0052***	***0.0043***	***0.0036***	***0.0033***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.15E-03	8.64E-04	6.07E-04	4.81E-04	4.17E-04	7.73E-04	1.71E-03	3.21E-03	4.18E-03	4.07E-03	3.85E-03	3.73E-03	3.17E-03	2.96E-03	3.13E-03	3.28E-03	3.33E-03	3.55E-03	3.64E-03	3.47E-03	2.86E-03	2.41E-03	2.23E-03	1.93E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.75E-04	4.32E-04	3.04E-04	2.40E-04	2.09E-04	3.87E-04	8.53E-04	1.60E-03	2.09E-03	2.04E-03	1.93E-03	1.86E-03	1.58E-03	1.48E-03	1.57E-03	1.64E-03	1.67E-03	1.77E-03	1.82E-03	1.73E-03	1.43E-03	1.21E-03	1.11E-03	9.67E-04
	Emission in each Box of 1st jet	g/s	3.83E-04	2.88E-04	2.02E-04	1.60E-04	1.39E-04	2.58E-04	5.69E-04	1.07E-03	1.39E-03	1.36E-03	1.28E-03	1.24E-03	1.06E-03	9.86E-04	1.04E-03	1.09E-03	1.11E-03	1.18E-03	1.21E-03	1.16E-03	9.54E-04	8.04E-04	7.42E-04	6.44E-04
	Emission in each Box of 2nd jet	g/s	1.92E-04	1.44E-04	1.01E-04	8.01E-05	6.96E-05	1.29E-04	2.84E-04	5.34E-04	6.97E-04	6.79E-04	6.42E-04	6.21E-04	5.28E-04	4.93E-04	5.22E-04	5.47E-04	5.55E-04	5.91E-04	6.07E-04	5.78E-04	4.77E-04	4.02E-04	3.71E-04	3.22E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1628	0.1210	0.1237	0.1388	0.1491	0.3492	0.3724	0.2493	0.1851	0.1827	0.1824	0.1865	0.1503	0.1535	0.1507	0.1509	0.1492	0.1496	0.1476	0.1444	0.1496	0.1587	0.1601	0.1549
	NO2	g/vehicle/km	0.0240	0.0222	0.0226	0.0239	0.0244	0.0354	0.0363	0.0290	0.0256	0.0254	0.0256	0.0259	0.0251	0.0253	0.0251	0.0251	0.0246	0.0245	0.0244	0.0243	0.0247	0.0252	0.0252	0.0249
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0118***	***0.0071***	***0.0050***	***0.0042***	***0.0038***	***0.0112***	***0.0255***	***0.0408***	***0.0446***	***0.0427***	***0.0393***	***0.0385***	***0.0272***	***0.0260***	***0.0271***	***0.0285***	***0.0293***	***0.0316***	***0.0330***	***0.0310***	***0.0263***	***0.0229***	***0.0216***	***0.0184***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.86E-03	4.72E-03	3.33E-03	2.80E-03	2.51E-03	7.46E-03	1.70E-02	2.72E-02	2.98E-02	2.85E-02	2.62E-02	2.57E-02	1.81E-02	1.73E-02	1.81E-02	1.90E-02	1.95E-02	2.11E-02	2.20E-02	2.07E-02	1.75E-02	1.53E-02	1.44E-02	1.23E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.93E-03	2.36E-03	1.67E-03	1.40E-03	1.26E-03	3.73E-03	8.51E-03	1.36E-02	1.49E-02	1.42E-02	1.31E-02	1.28E-02	9.06E-03	8.66E-03	9.03E-03	9.48E-03	9.76E-03	1.05E-02	1.10E-02	1.03E-02	8.77E-03	7.63E-03	7.19E-03	6.14E-03
	Emission in each Box of 1st jet	g/s	2.62E-03	1.57E-03	1.11E-03	9.34E-04	8.38E-04	2.49E-03	5.67E-03	9.07E-03	9.92E-03	9.49E-03	8.73E-03	8.56E-03	6.04E-03	5.78E-03	6.02E-03	6.32E-03	6.51E-03	7.02E-03	7.32E-03	6.88E-03	5.85E-03	5.09E-03	4.79E-03	4.09E-03
	Emission in each Box of 2nd jet	g/s	1.31E-03	7.86E-04	5.56E-04	4.67E-04	4.19E-04	1.24E-03	2.84E-03	4.53E-03	4.96E-03	4.75E-03	4.37E-03	4.28E-03	3.02E-03	2.89E-03	3.01E-03	3.16E-03	3.25E-03	3.51E-03	3.66E-03	3.44E-03	2.92E-03	2.54E-03	2.40E-03	2.05E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0025***	***0.0047***	***0.0062***	***0.0059***	***0.0055***	***0.0053***	***0.0045***	***0.0043***	***0.0045***	***0.0047***	***0.0048***	***0.0052***	***0.0054***	***0.0052***	***0.0044***	***0.0036***	***0.0034***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.16E-03	8.66E-04	6.09E-04	4.83E-04	4.11E-04	7.56E-04	1.66E-03	3.16E-03	4.11E-03	3.96E-03	3.67E-03	3.57E-03	3.02E-03	2.86E-03	3.00E-03	3.15E-03	3.22E-03	3.45E-03	3.63E-03	3.47E-03	2.90E-03	2.42E-03	2.27E-03	1.98E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.80E-04	4.33E-04	3.05E-04	2.41E-04	2.05E-04	3.78E-04	8.29E-04	1.58E-03	2.06E-03	1.98E-03	1.84E-03	1.78E-03	1.51E-03	1.43E-03	1.50E-03	1.57E-03	1.61E-03	1.73E-03	1.82E-03	1.74E-03	1.45E-03	1.21E-03	1.13E-03	9.88E-04
	Emission in each Box of 1st jet	g/s	3.87E-04	2.89E-04	2.03E-04	1.61E-04	1.37E-04	2.52E-04	5.53E-04	1.05E-03	1.37E-03	1.32E-03	1.22E-03	1.19E-03	1.01E-03	9.52E-04	1.00E-03	1.05E-03	1.07E-03	1.15E-03	1.21E-03	1.16E-03	9.67E-04	8.07E-04	7.56E-04	6.59E-04
	Emission in each Box of 2nd jet	g/s	1.93E-04	1.44E-04	1.02E-04	8.05E-05	6.85E-05	1.26E-04	2.76E-04	5.27E-04	6.86E-04	6.61E-04	6.12E-04	5.94E-04	5.04E-04	4.76E-04	5.01E-04	5.25E-04	5.36E-04	5.76E-04	6.05E-04	5.79E-04	4.83E-04	4.03E-04	3.78E-04	3.29E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1495	0.1123	0.1159	0.1299	0.1400	0.3321	0.3599	0.2491	0.1839	0.1823	0.1848	0.1868	0.1482	0.1518	0.1474	0.1476	0.1465	0.1448	0.1407	0.1358	0.1395	0.1478	0.1460	0.1382
	NO2	g/vehicle/km	0.0223	0.0208	0.0214	0.0227	0.0231	0.0338	0.0351	0.0290	0.0255	0.0255	0.0260	0.0260	0.0248	0.0251	0.0246	0.0246	0.0242	0.0238	0.0234	0.0231	0.0232	0.0236	0.0232	0.0225
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0108***	***0.0066***	***0.0047***	***0.0039***	***0.0035***	***0.0106***	***0.0247***	***0.0408***	***0.0444***	***0.0426***	***0.0398***	***0.0386***	***0.0268***	***0.0257***	***0.0265***	***0.0278***	***0.0287***	***0.0306***	***0.0314***	***0.0291***	***0.0245***	***0.0213***	***0.0197***	***0.0164***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.21E-03	4.38E-03	3.12E-03	2.62E-03	2.36E-03	7.09E-03	1.65E-02	2.72E-02	2.96E-02	2.84E-02	2.66E-02	2.57E-02	1.79E-02	1.71E-02	1.77E-02	1.86E-02	1.92E-02	2.04E-02	2.10E-02	1.94E-02	1.64E-02	1.42E-02	1.31E-02	1.10E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.61E-03	2.19E-03	1.56E-03	1.31E-03	1.18E-03	3.55E-03	8.23E-03	1.36E-02	1.48E-02	1.42E-02	1.33E-02	1.29E-02	8.94E-03	8.57E-03	8.83E-03	9.28E-03	9.58E-03	1.02E-02	1.05E-02	9.71E-03	8.18E-03	7.11E-03	6.56E-03	5.48E-03
	Emission in each Box of 1st jet	g/s	2.40E-03	1.46E-03	1.04E-03	8.74E-04	7.87E-04	2.36E-03	5.48E-03	9.06E-03	9.86E-03	9.48E-03	8.85E-03	8.58E-03	5.96E-03	5.71E-03	5.89E-03	6.18E-03	6.39E-03	6.80E-03	6.99E-03	6.47E-03	5.45E-03	4.74E-03	4.37E-03	3.65E-03
	Emission in each Box of 2nd jet	g/s	1.20E-03	7.29E-04	5.21E-04	4.37E-04	3.93E-04	1.18E-03	2.74E-03	4.53E-03	4.93E-03	4.74E-03	4.43E-03	4.29E-03	2.98E-03	2.86E-03	2.94E-03	3.09E-03	3.19E-03	3.40E-03	3.49E-03	3.24E-03	2.73E-03	2.37E-03	2.19E-03	1.83E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0024***	***0.0048***	***0.0062***	***0.0060***	***0.0056***	***0.0054***	***0.0045***	***0.0043***	***0.0044***	***0.0046***	***0.0047***	***0.0050***	***0.0052***	***0.0049***	***0.0041***	***0.0034***	***0.0031***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.08E-03	8.12E-04	5.77E-04	4.58E-04	3.89E-04	7.22E-04	1.61E-03	3.17E-03	4.10E-03	3.97E-03	3.73E-03	3.58E-03	2.99E-03	2.83E-03	2.95E-03	3.10E-03	3.17E-03	3.36E-03	3.48E-03	3.30E-03	2.73E-03	2.27E-03	2.09E-03	1.79E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.38E-04	4.06E-04	2.88E-04	2.29E-04	1.95E-04	3.61E-04	8.03E-04	1.58E-03	2.05E-03	1.99E-03	1.87E-03	1.79E-03	1.50E-03	1.42E-03	1.48E-03	1.55E-03	1.58E-03	1.68E-03	1.74E-03	1.65E-03	1.36E-03	1.14E-03	1.04E-03	8.93E-04
	Emission in each Box of 1st jet	g/s	3.59E-04	2.71E-04	1.92E-04	1.53E-04	1.30E-04	2.41E-04	5.35E-04	1.06E-03	1.37E-03	1.32E-03	1.24E-03	1.19E-03	9.97E-04	9.45E-04	9.84E-04	1.03E-03	1.06E-03	1.12E-03	1.16E-03	1.10E-03	9.09E-04	7.57E-04	6.96E-04	5.96E-04
	Emission in each Box of 2nd jet	g/s	1.79E-04	1.35E-04	9.62E-05	7.63E-05	6.49E-05	1.20E-04	2.68E-04	5.28E-04	6.84E-04	6.62E-04	6.22E-04	5.97E-04	4.98E-04	4.72E-04	4.92E-04	5.16E-04	5.28E-04	5.60E-04	5.80E-04	5.50E-04	4.55E-04	3.78E-04	3.48E-04	2.98E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1438	0.1044	0.1059	0.1174	0.1260	0.2991	0.3194	0.2140	0.1618	0.1603	0.1646	0.1687	0.1359	0.1358	0.1354	0.1341	0.1310	0.1290	0.1259	0.1232	0.1277	0.1386	0.1381	0.1321
	NO2	g/vehicle/km	0.0215	0.0195	0.0198	0.0207	0.0211	0.0307	0.0314	0.0252	0.0227	0.0227	0.0234	0.0237	0.0229	0.0227	0.0228	0.0226	0.0219	0.0214	0.0211	0.0211	0.0214	0.0222	0.0220	0.0216
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0104***	***0.0061***	***0.0043***	***0.0036***	***0.0032***	***0.0096***	***0.0219***	***0.0350***	***0.0390***	***0.0375***	***0.0355***	***0.0348***	***0.0246***	***0.0230***	***0.0243***	***0.0253***	***0.0257***	***0.0272***	***0.0281***	***0.0264***	***0.0225***	***0.0200***	***0.0186***	***0.0157***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.94E-03	4.07E-03	2.85E-03	2.37E-03	2.12E-03	6.39E-03	1.46E-02	2.34E-02	2.60E-02	2.50E-02	2.36E-02	2.32E-02	1.64E-02	1.53E-02	1.62E-02	1.69E-02	1.71E-02	1.82E-02	1.87E-02	1.76E-02	1.50E-02	1.33E-02	1.24E-02	1.05E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.47E-03	2.03E-03	1.43E-03	1.18E-03	1.06E-03	3.19E-03	7.30E-03	1.17E-02	1.30E-02	1.25E-02	1.18E-02	1.16E-02	8.19E-03	7.67E-03	8.11E-03	8.43E-03	8.57E-03	9.08E-03	9.37E-03	8.81E-03	7.49E-03	6.66E-03	6.20E-03	5.23E-03
	Emission in each Box of 1st jet	g/s	2.31E-03	1.36E-03	9.51E-04	7.89E-04	7.08E-04	2.13E-03	4.87E-03	7.78E-03	8.67E-03	8.33E-03	7.88E-03	7.74E-03	5.46E-03	5.11E-03	5.41E-03	5.62E-03	5.71E-03	6.06E-03	6.25E-03	5.87E-03	5.00E-03	4.44E-03	4.14E-03	3.49E-03
	Emission in each Box of 2nd jet	g/s	1.16E-03	6.78E-04	4.76E-04	3.95E-04	3.54E-04	1.06E-03	2.43E-03	3.89E-03	4.34E-03	4.17E-03	3.94E-03	3.87E-03	2.73E-03	2.56E-03	2.70E-03	2.81E-03	2.86E-03	3.03E-03	3.12E-03	2.94E-03	2.50E-03	2.22E-03	2.07E-03	1.74E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0010***	***0.0022***	***0.0041***	***0.0055***	***0.0053***	***0.0050***	***0.0049***	***0.0042***	***0.0038***	***0.0041***	***0.0043***	***0.0043***	***0.0045***	***0.0047***	***0.0045***	***0.0038***	***0.0032***	***0.0030***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.04E-03	7.61E-04	5.34E-04	4.19E-04	3.56E-04	6.55E-04	1.44E-03	2.75E-03	3.65E-03	3.53E-03	3.36E-03	3.26E-03	2.77E-03	2.57E-03	2.74E-03	2.84E-03	2.86E-03	3.02E-03	3.14E-03	3.01E-03	2.51E-03	2.14E-03	1.98E-03	1.71E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.20E-04	3.80E-04	2.67E-04	2.09E-04	1.78E-04	3.27E-04	7.18E-04	1.37E-03	1.83E-03	1.77E-03	1.68E-03	1.63E-03	1.38E-03	1.28E-03	1.37E-03	1.42E-03	1.43E-03	1.51E-03	1.57E-03	1.51E-03	1.26E-03	1.07E-03	9.90E-04	8.55E-04
	Emission in each Box of 1st jet	g/s	3.46E-04	2.54E-04	1.78E-04	1.40E-04	1.19E-04	2.18E-04	4.79E-04	9.15E-04	1.22E-03	1.18E-03	1.12E-03	1.09E-03	9.22E-04	8.55E-04	9.12E-04	9.46E-04	9.55E-04	1.01E-03	1.05E-03	1.00E-03	8.38E-04	7.12E-04	6.60E-04	5.70E-04
	Emission in each Box of 2nd jet	g/s	1.73E-04	1.27E-04	8.90E-05	6.98E-05	5.93E-05	1.09E-04	2.39E-04	4.58E-04	6.09E-04	5.89E-04	5.59E-04	5.43E-04	4.61E-04	4.28E-04	4.56E-04	4.73E-04	4.77E-04	5.03E-04	5.23E-04	5.02E-04	4.19E-04	3.56E-04	3.30E-04	2.85E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1309	0.0986	0.1030	0.1131	0.1210	0.2855	0.3048	0.2107	0.1612	0.1579	0.1616	0.1626	0.1310	0.1361	0.1340	0.1338	0.1302	0.1307	0.1307	0.1251	0.1294	0.1389	0.1368	0.1338
	NO2	g/vehicle/km	0.0197	0.0186	0.0193	0.0201	0.0204	0.0294	0.0301	0.0248	0.0226	0.0223	0.0230	0.0229	0.0221	0.0228	0.0226	0.0226	0.0217	0.0217	0.0219	0.0214	0.0217	0.0223	0.0219	0.0219
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0095***	***0.0058***	***0.0042***	***0.0034***	***0.0031***	***0.0091***	***0.0209***	***0.0345***	***0.0389***	***0.0369***	***0.0348***	***0.0336***	***0.0237***	***0.0231***	***0.0241***	***0.0252***	***0.0255***	***0.0276***	***0.0292***	***0.0268***	***0.0228***	***0.0200***	***0.0184***	***0.0159***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.31E-03	3.84E-03	2.78E-03	2.28E-03	2.04E-03	6.10E-03	1.39E-02	2.30E-02	2.59E-02	2.46E-02	2.32E-02	2.24E-02	1.58E-02	1.54E-02	1.61E-02	1.68E-02	1.70E-02	1.84E-02	1.95E-02	1.79E-02	1.52E-02	1.34E-02	1.23E-02	1.06E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.16E-03	1.92E-03	1.39E-03	1.14E-03	1.02E-03	3.05E-03	6.97E-03	1.15E-02	1.30E-02	1.23E-02	1.16E-02	1.12E-02	7.90E-03	7.68E-03	8.03E-03	8.41E-03	8.51E-03	9.20E-03	9.73E-03	8.94E-03	7.59E-03	6.68E-03	6.14E-03	5.30E-03
	Emission in each Box of 1st jet	g/s	2.10E-03	1.28E-03	9.25E-04	7.61E-04	6.80E-04	2.03E-03	4.64E-03	7.67E-03	8.64E-03	8.20E-03	7.74E-03	7.47E-03	5.27E-03	5.12E-03	5.35E-03	5.61E-03	5.67E-03	6.14E-03	6.49E-03	5.96E-03	5.06E-03	4.45E-03	4.10E-03	3.53E-03
	Emission in each Box of 2nd jet	g/s	1.05E-03	6.41E-04	4.63E-04	3.80E-04	3.40E-04	1.02E-03	2.32E-03	3.83E-03	4.32E-03	4.10E-03	3.87E-03	3.73E-03	2.63E-03	2.56E-03	2.68E-03	2.80E-03	2.84E-03	3.07E-03	3.24E-03	2.98E-03	2.53E-03	2.23E-03	2.05E-03	1.77E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0021***	***0.0041***	***0.0055***	***0.0052***	***0.0050***	***0.0047***	***0.0040***	***0.0039***	***0.0041***	***0.0043***	***0.0043***	***0.0046***	***0.0049***	***0.0046***	***0.0038***	***0.0032***	***0.0029***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.51E-04	7.25E-04	5.21E-04	4.06E-04	3.44E-04	6.28E-04	1.38E-03	2.71E-03	3.64E-03	3.48E-03	3.30E-03	3.15E-03	2.67E-03	2.57E-03	2.71E-03	2.84E-03	2.84E-03	3.06E-03	3.26E-03	3.06E-03	2.54E-03	2.14E-03	1.97E-03	1.74E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.76E-04	3.63E-04	2.60E-04	2.03E-04	1.72E-04	3.14E-04	6.88E-04	1.35E-03	1.82E-03	1.74E-03	1.65E-03	1.58E-03	1.33E-03	1.29E-03	1.36E-03	1.42E-03	1.42E-03	1.53E-03	1.63E-03	1.53E-03	1.27E-03	1.07E-03	9.83E-04	8.68E-04
	Emission in each Box of 1st jet	g/s	3.17E-04	2.42E-04	1.74E-04	1.35E-04	1.15E-04	2.09E-04	4.59E-04	9.02E-04	1.21E-03	1.16E-03	1.10E-03	1.05E-03	8.90E-04	8.57E-04	9.04E-04	9.45E-04	9.45E-04	1.02E-03	1.09E-03	1.02E-03	8.48E-04	7.14E-04	6.55E-04	5.79E-04
	Emission in each Box of 2nd jet	g/s	1.59E-04	1.21E-04	8.68E-05	6.76E-05	5.73E-05	1.05E-04	2.29E-04	4.51E-04	6.07E-04	5.81E-04	5.50E-04	5.25E-04	4.45E-04	4.29E-04	4.52E-04	4.73E-04	4.73E-04	5.10E-04	5.43E-04	5.11E-04	4.24E-04	3.57E-04	3.28E-04	2.89E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1278	0.0951	0.0985	0.1080	0.1138	0.2781	0.2927	0.2011	0.1527	0.1579	0.1643	0.1707	0.1359	0.1384	0.1368	0.1377	0.1290	0.1291	0.1264	0.1202	0.1208	0.1298	0.1281	0.1216
	NO2	g/vehicle/km	0.0193	0.0180	0.0186	0.0193	0.0193	0.0287	0.0290	0.0237	0.0215	0.0224	0.0233	0.0239	0.0229	0.0231	0.0230	0.0231	0.0215	0.0214	0.0212	0.0206	0.0204	0.0210	0.0206	0.0200
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0093***	***0.0056***	***0.0040***	***0.0033***	***0.0029***	***0.0089***	***0.0201***	***0.0329***	***0.0368***	***0.0369***	***0.0354***	***0.0353***	***0.0246***	***0.0234***	***0.0246***	***0.0260***	***0.0253***	***0.0273***	***0.0282***	***0.0258***	***0.0213***	***0.0187***	***0.0173***	***0.0145***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.17E-03	3.70E-03	2.65E-03	2.18E-03	1.92E-03	5.94E-03	1.34E-02	2.19E-02	2.46E-02	2.46E-02	2.36E-02	2.35E-02	1.64E-02	1.56E-02	1.64E-02	1.73E-02	1.69E-02	1.82E-02	1.88E-02	1.72E-02	1.42E-02	1.25E-02	1.15E-02	9.64E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.08E-03	1.85E-03	1.33E-03	1.09E-03	9.60E-04	2.97E-03	6.69E-03	1.10E-02	1.23E-02	1.23E-02	1.18E-02	1.18E-02	8.19E-03	7.81E-03	8.19E-03	8.66E-03	8.44E-03	9.09E-03	9.41E-03	8.59E-03	7.09E-03	6.24E-03	5.76E-03	4.82E-03
	Emission in each Box of 1st jet	g/s	2.06E-03	1.23E-03	8.85E-04	7.27E-04	6.40E-04	1.98E-03	4.46E-03	7.31E-03	8.18E-03	8.21E-03	7.87E-03	7.84E-03	5.46E-03	5.21E-03	5.46E-03	5.77E-03	5.62E-03	6.06E-03	6.27E-03	5.73E-03	4.72E-03	4.16E-03	3.84E-03	3.21E-03
	Emission in each Box of 2nd jet	g/s	1.03E-03	6.17E-04	4.42E-04	3.63E-04	3.20E-04	9.90E-04	2.23E-03	3.66E-03	4.09E-03	4.10E-03	3.93E-03	3.92E-03	2.73E-03	2.60E-03	2.73E-03	2.89E-03	2.81E-03	3.03E-03	3.14E-03	2.86E-03	2.36E-03	2.08E-03	1.92E-03	1.61E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0020***	***0.0039***	***0.0052***	***0.0052***	***0.0050***	***0.0049***	***0.0042***	***0.0039***	***0.0041***	***0.0044***	***0.0042***	***0.0045***	***0.0047***	***0.0044***	***0.0036***	***0.0030***	***0.0028***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.32E-04	7.02E-04	5.01E-04	3.90E-04	3.26E-04	6.12E-04	1.32E-03	2.59E-03	3.45E-03	3.49E-03	3.35E-03	3.29E-03	2.77E-03	2.61E-03	2.76E-03	2.91E-03	2.81E-03	3.02E-03	3.15E-03	2.94E-03	2.39E-03	2.02E-03	1.85E-03	1.59E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.66E-04	3.51E-04	2.51E-04	1.95E-04	1.63E-04	3.06E-04	6.62E-04	1.30E-03	1.73E-03	1.74E-03	1.67E-03	1.65E-03	1.38E-03	1.31E-03	1.38E-03	1.45E-03	1.41E-03	1.51E-03	1.58E-03	1.47E-03	1.20E-03	1.01E-03	9.25E-04	7.93E-04
	Emission in each Box of 1st jet	g/s	3.11E-04	2.34E-04	1.67E-04	1.30E-04	1.09E-04	2.04E-04	4.41E-04	8.63E-04	1.15E-03	1.16E-03	1.12E-03	1.10E-03	9.22E-04	8.70E-04	9.20E-04	9.70E-04	9.38E-04	1.01E-03	1.05E-03	9.81E-04	7.97E-04	6.72E-04	6.17E-04	5.29E-04
	Emission in each Box of 2nd jet	g/s	1.55E-04	1.17E-04	8.36E-05	6.50E-05	5.43E-05	1.02E-04	2.21E-04	4.32E-04	5.75E-04	5.81E-04	5.58E-04	5.49E-04	4.61E-04	4.35E-04	4.60E-04	4.85E-04	4.69E-04	5.03E-04	5.25E-04	4.91E-04	3.98E-04	3.36E-04	3.08E-04	2.64E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1353	0.0978	0.1021	0.1140	0.1210	0.2843	0.3035	0.2001	0.1542	0.1547	0.1606	0.1633	0.1321	0.1382	0.1369	0.1358	0.1378	0.1352	0.1337	0.1273	0.1268	0.1318	0.1330	0.1281
	NO2	g/vehicle/km	0.0203	0.0185	0.0192	0.0203	0.0204	0.0293	0.0300	0.0236	0.0217	0.0219	0.0228	0.0230	0.0223	0.0231	0.0231	0.0229	0.0229	0.0224	0.0223	0.0218	0.0213	0.0212	0.0213	0.0210
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0098***	***0.0057***	***0.0041***	***0.0035***	***0.0031***	***0.0091***	***0.0208***	***0.0328***	***0.0372***	***0.0362***	***0.0346***	***0.0337***	***0.0239***	***0.0234***	***0.0246***	***0.0256***	***0.0270***	***0.0286***	***0.0299***	***0.0273***	***0.0223***	***0.0190***	***0.0179***	***0.0152***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.53E-03	3.81E-03	2.75E-03	2.30E-03	2.04E-03	6.07E-03	1.39E-02	2.18E-02	2.48E-02	2.41E-02	2.31E-02	2.25E-02	1.59E-02	1.56E-02	1.64E-02	1.71E-02	1.80E-02	1.90E-02	1.99E-02	1.82E-02	1.49E-02	1.27E-02	1.19E-02	1.01E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.26E-03	1.91E-03	1.38E-03	1.15E-03	1.02E-03	3.04E-03	6.94E-03	1.09E-02	1.24E-02	1.21E-02	1.15E-02	1.12E-02	7.97E-03	7.80E-03	8.20E-03	8.54E-03	9.01E-03	9.52E-03	9.95E-03	9.10E-03	7.44E-03	6.34E-03	5.97E-03	5.07E-03
	Emission in each Box of 1st jet	g/s	2.18E-03	1.27E-03	9.17E-04	7.67E-04	6.80E-04	2.02E-03	4.62E-03	7.28E-03	8.26E-03	8.04E-03	7.69E-03	7.50E-03	5.31E-03	5.20E-03	5.47E-03	5.69E-03	6.01E-03	6.35E-03	6.63E-03	6.07E-03	4.96E-03	4.23E-03	3.98E-03	3.38E-03
	Emission in each Box of 2nd jet	g/s	1.09E-03	6.35E-04	4.59E-04	3.83E-04	3.40E-04	1.01E-03	2.31E-03	3.64E-03	4.13E-03	4.02E-03	3.84E-03	3.75E-03	2.66E-03	2.60E-03	2.73E-03	2.85E-03	3.00E-03	3.17E-03	3.32E-03	3.03E-03	2.48E-03	2.11E-03	1.99E-03	1.69E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0021***	***0.0039***	***0.0052***	***0.0051***	***0.0049***	***0.0047***	***0.0040***	***0.0039***	***0.0041***	***0.0043***	***0.0045***	***0.0047***	***0.0050***	***0.0047***	***0.0037***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.81E-04	7.19E-04	5.17E-04	4.09E-04	3.44E-04	6.25E-04	1.37E-03	2.58E-03	3.48E-03	3.42E-03	3.28E-03	3.17E-03	2.69E-03	2.61E-03	2.76E-03	2.87E-03	3.00E-03	3.16E-03	3.33E-03	3.11E-03	2.50E-03	2.04E-03	1.92E-03	1.66E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.91E-04	3.60E-04	2.58E-04	2.04E-04	1.72E-04	3.12E-04	6.85E-04	1.29E-03	1.74E-03	1.71E-03	1.64E-03	1.58E-03	1.34E-03	1.30E-03	1.38E-03	1.44E-03	1.50E-03	1.58E-03	1.66E-03	1.56E-03	1.25E-03	1.02E-03	9.58E-04	8.32E-04
	Emission in each Box of 1st jet	g/s	3.27E-04	2.40E-04	1.72E-04	1.36E-04	1.15E-04	2.08E-04	4.57E-04	8.59E-04	1.16E-03	1.14E-03	1.09E-03	1.06E-03	8.96E-04	8.69E-04	9.22E-04	9.58E-04	1.00E-03	1.05E-03	1.11E-03	1.04E-03	8.33E-04	6.81E-04	6.39E-04	5.55E-04
	Emission in each Box of 2nd jet	g/s	1.64E-04	1.20E-04	8.62E-05	6.81E-05	5.73E-05	1.04E-04	2.28E-04	4.30E-04	5.80E-04	5.70E-04	5.47E-04	5.28E-04	4.48E-04	4.35E-04	4.61E-04	4.79E-04	5.00E-04	5.27E-04	5.54E-04	5.19E-04	4.16E-04	3.40E-04	3.19E-04	2.77E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1344	0.1000	0.1006	0.1091	0.1203	0.2768	0.2969	0.1967	0.1475	0.1478	0.1591	0.1559	0.1298	0.1342	0.1360	0.1287	0.1238	0.1279	0.1274	0.1214	0.1267	0.1331	0.1326	0.1266
	NO2	g/vehicle/km	0.0202	0.0188	0.0189	0.0195	0.0203	0.0285	0.0294	0.0233	0.0208	0.0210	0.0226	0.0219	0.0219	0.0225	0.0229	0.0217	0.0207	0.0212	0.0214	0.0208	0.0213	0.0214	0.0213	0.0208
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0097***	***0.0058***	***0.0041***	***0.0033***	***0.0030***	***0.0089***	***0.0204***	***0.0322***	***0.0356***	***0.0346***	***0.0343***	***0.0322***	***0.0235***	***0.0227***	***0.0244***	***0.0243***	***0.0243***	***0.0270***	***0.0285***	***0.0260***	***0.0223***	***0.0192***	***0.0179***	***0.0151***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.48E-03	3.90E-03	2.71E-03	2.20E-03	2.03E-03	5.91E-03	1.36E-02	2.15E-02	2.37E-02	2.30E-02	2.29E-02	2.15E-02	1.57E-02	1.52E-02	1.63E-02	1.62E-02	1.62E-02	1.80E-02	1.90E-02	1.74E-02	1.49E-02	1.28E-02	1.19E-02	1.00E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.24E-03	1.95E-03	1.36E-03	1.10E-03	1.01E-03	2.96E-03	6.78E-03	1.07E-02	1.19E-02	1.15E-02	1.14E-02	1.07E-02	7.83E-03	7.58E-03	8.15E-03	8.09E-03	8.09E-03	9.01E-03	9.49E-03	8.68E-03	7.43E-03	6.40E-03	5.96E-03	5.02E-03
	Emission in each Box of 1st jet	g/s	2.16E-03	1.30E-03	9.04E-04	7.34E-04	6.76E-04	1.97E-03	4.52E-03	7.16E-03	7.90E-03	7.68E-03	7.62E-03	7.16E-03	5.22E-03	5.05E-03	5.43E-03	5.39E-03	5.40E-03	6.00E-03	6.33E-03	5.79E-03	4.95E-03	4.27E-03	3.97E-03	3.35E-03
	Emission in each Box of 2nd jet	g/s	1.08E-03	6.50E-04	4.52E-04	3.67E-04	3.38E-04	9.86E-04	2.26E-03	3.58E-03	3.95E-03	3.84E-03	3.81E-03	3.58E-03	2.61E-03	2.53E-03	2.72E-03	2.70E-03	2.70E-03	3.00E-03	3.16E-03	2.89E-03	2.48E-03	2.13E-03	1.99E-03	1.67E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0020***	***0.0038***	***0.0050***	***0.0049***	***0.0049***	***0.0045***	***0.0040***	***0.0038***	***0.0041***	***0.0041***	***0.0041***	***0.0045***	***0.0048***	***0.0045***	***0.0037***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.75E-04	7.34E-04	5.10E-04	3.93E-04	3.42E-04	6.10E-04	1.34E-03	2.54E-03	3.35E-03	3.27E-03	3.25E-03	3.02E-03	2.65E-03	2.54E-03	2.75E-03	2.73E-03	2.71E-03	2.99E-03	3.19E-03	2.97E-03	2.50E-03	2.06E-03	1.91E-03	1.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.87E-04	3.67E-04	2.55E-04	1.97E-04	1.71E-04	3.05E-04	6.71E-04	1.27E-03	1.67E-03	1.63E-03	1.63E-03	1.51E-03	1.32E-03	1.27E-03	1.37E-03	1.36E-03	1.35E-03	1.50E-03	1.59E-03	1.49E-03	1.25E-03	1.03E-03	9.55E-04	8.23E-04
	Emission in each Box of 1st jet	g/s	3.25E-04	2.45E-04	1.70E-04	1.31E-04	1.14E-04	2.03E-04	4.47E-04	8.46E-04	1.12E-03	1.09E-03	1.08E-03	1.01E-03	8.82E-04	8.45E-04	9.15E-04	9.09E-04	9.03E-04	9.98E-04	1.06E-03	9.91E-04	8.32E-04	6.87E-04	6.37E-04	5.48E-04
	Emission in each Box of 2nd jet	g/s	1.62E-04	1.22E-04	8.51E-05	6.56E-05	5.69E-05	1.02E-04	2.24E-04	4.23E-04	5.58E-04	5.45E-04	5.42E-04	5.04E-04	4.41E-04	4.23E-04	4.58E-04	4.54E-04	4.51E-04	4.99E-04	5.31E-04	4.96E-04	4.16E-04	3.43E-04	3.18E-04	2.74E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1535	0.1163	0.1179	0.1300	0.1401	0.3341	0.3546	0.2355	0.1765	0.1748	0.1785	0.1832	0.1489	0.1505	0.1470	0.1487	0.1434	0.1441	0.1438	0.1379	0.1430	0.1502	0.1511	0.1470
	NO2	g/vehicle/km	0.0228	0.0214	0.0217	0.0226	0.0231	0.0339	0.0346	0.0275	0.0245	0.0245	0.0251	0.0255	0.0249	0.0249	0.0245	0.0248	0.0237	0.0237	0.0238	0.0234	0.0237	0.0239	0.0239	0.0238
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0111***	***0.0068***	***0.0048***	***0.0039***	***0.0035***	***0.0107***	***0.0243***	***0.0386***	***0.0426***	***0.0409***	***0.0385***	***0.0379***	***0.0269***	***0.0255***	***0.0264***	***0.0280***	***0.0281***	***0.0304***	***0.0321***	***0.0296***	***0.0252***	***0.0217***	***0.0204***	***0.0175***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.41E-03	4.53E-03	3.18E-03	2.62E-03	2.36E-03	7.14E-03	1.62E-02	2.57E-02	2.84E-02	2.72E-02	2.56E-02	2.52E-02	1.80E-02	1.70E-02	1.76E-02	1.87E-02	1.88E-02	2.03E-02	2.14E-02	1.97E-02	1.68E-02	1.44E-02	1.36E-02	1.16E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.70E-03	2.27E-03	1.59E-03	1.31E-03	1.18E-03	3.57E-03	8.10E-03	1.29E-02	1.42E-02	1.36E-02	1.28E-02	1.26E-02	8.98E-03	8.50E-03	8.80E-03	9.35E-03	9.38E-03	1.01E-02	1.07E-02	9.86E-03	8.39E-03	7.22E-03	6.79E-03	5.82E-03
	Emission in each Box of 1st jet	g/s	2.47E-03	1.51E-03	1.06E-03	8.74E-04	7.87E-04	2.38E-03	5.40E-03	8.57E-03	9.46E-03	9.08E-03	8.55E-03	8.41E-03	5.99E-03	5.66E-03	5.87E-03	6.23E-03	6.25E-03	6.77E-03	7.14E-03	6.57E-03	5.59E-03	4.81E-03	4.52E-03	3.88E-03
	Emission in each Box of 2nd jet	g/s	1.23E-03	7.55E-04	5.29E-04	4.37E-04	3.94E-04	1.19E-03	2.70E-03	4.28E-03	4.73E-03	4.54E-03	4.27E-03	4.21E-03	2.99E-03	2.83E-03	2.93E-03	3.12E-03	3.13E-03	3.38E-03	3.57E-03	3.29E-03	2.80E-03	2.41E-03	2.26E-03	1.94E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0024***	***0.0045***	***0.0059***	***0.0057***	***0.0054***	***0.0053***	***0.0045***	***0.0042***	***0.0044***	***0.0047***	***0.0047***	***0.0050***	***0.0053***	***0.0050***	***0.0042***	***0.0035***	***0.0032***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.10E-03	8.35E-04	5.84E-04	4.57E-04	3.89E-04	7.25E-04	1.58E-03	3.00E-03	3.95E-03	3.82E-03	3.61E-03	3.51E-03	3.00E-03	2.81E-03	2.94E-03	3.11E-03	3.10E-03	3.34E-03	3.54E-03	3.34E-03	2.78E-03	2.30E-03	2.15E-03	1.88E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.50E-04	4.17E-04	2.92E-04	2.28E-04	1.95E-04	3.62E-04	7.92E-04	1.50E-03	1.97E-03	1.91E-03	1.80E-03	1.75E-03	1.50E-03	1.40E-03	1.47E-03	1.56E-03	1.55E-03	1.67E-03	1.77E-03	1.67E-03	1.39E-03	1.15E-03	1.08E-03	9.42E-04
	Emission in each Box of 1st jet	g/s	3.66E-04	2.78E-04	1.95E-04	1.52E-04	1.30E-04	2.42E-04	5.28E-04	9.99E-04	1.32E-03	1.27E-03	1.20E-03	1.17E-03	1.00E-03	9.37E-04	9.80E-04	1.04E-03	1.03E-03	1.11E-03	1.18E-03	1.11E-03	9.28E-04	7.67E-04	7.17E-04	6.28E-04
	Emission in each Box of 2nd jet	g/s	1.83E-04	1.39E-04	9.74E-05	7.61E-05	6.49E-05	1.21E-04	2.64E-04	5.00E-04	6.58E-04	6.37E-04	6.01E-04	5.85E-04	5.00E-04	4.68E-04	4.90E-04	5.19E-04	5.17E-04	5.57E-04	5.90E-04	5.56E-04	4.64E-04	3.84E-04	3.58E-04	3.14E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1683	0.1252	0.1290	0.1430	0.1536	0.3616	0.3877	0.2549	0.1914	0.1889	0.1935	0.1956	0.1601	0.1633	0.1602	0.1594	0.1543	0.1541	0.1536	0.1501	0.1537	0.1644	0.1644	0.1591
	NO2	g/vehicle/km	0.0247	0.0229	0.0234	0.0246	0.0250	0.0366	0.0377	0.0296	0.0263	0.0262	0.0270	0.0270	0.0265	0.0267	0.0265	0.0263	0.0253	0.0252	0.0252	0.0252	0.0253	0.0260	0.0259	0.0255
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0122***	***0.0073***	***0.0052***	***0.0043***	***0.0039***	***0.0116***	***0.0266***	***0.0417***	***0.0462***	***0.0442***	***0.0417***	***0.0404***	***0.0290***	***0.0277***	***0.0288***	***0.0301***	***0.0303***	***0.0326***	***0.0343***	***0.0322***	***0.0270***	***0.0237***	***0.0222***	***0.0189***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.12E-03	4.88E-03	3.48E-03	2.89E-03	2.59E-03	7.73E-03	1.77E-02	2.78E-02	3.08E-02	2.95E-02	2.78E-02	2.69E-02	1.93E-02	1.84E-02	1.92E-02	2.00E-02	2.02E-02	2.17E-02	2.29E-02	2.15E-02	1.80E-02	1.58E-02	1.48E-02	1.26E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.06E-03	2.44E-03	1.74E-03	1.44E-03	1.29E-03	3.86E-03	8.86E-03	1.39E-02	1.54E-02	1.47E-02	1.39E-02	1.35E-02	9.65E-03	9.22E-03	9.60E-03	1.00E-02	1.01E-02	1.09E-02	1.14E-02	1.07E-02	9.01E-03	7.91E-03	7.39E-03	6.30E-03
	Emission in each Box of 1st jet	g/s	2.71E-03	1.63E-03	1.16E-03	9.62E-04	8.63E-04	2.58E-03	5.91E-03	9.27E-03	1.03E-02	9.82E-03	9.27E-03	8.98E-03	6.44E-03	6.15E-03	6.40E-03	6.68E-03	6.73E-03	7.24E-03	7.62E-03	7.16E-03	6.01E-03	5.27E-03	4.92E-03	4.20E-03
	Emission in each Box of 2nd jet	g/s	1.35E-03	8.13E-04	5.79E-04	4.81E-04	4.32E-04	1.29E-03	2.95E-03	4.64E-03	5.13E-03	4.91E-03	4.63E-03	4.49E-03	3.22E-03	3.07E-03	3.20E-03	3.34E-03	3.36E-03	3.62E-03	3.81E-03	3.58E-03	3.00E-03	2.64E-03	2.46E-03	2.10E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0012***	***0.0026***	***0.0048***	***0.0064***	***0.0061***	***0.0058***	***0.0056***	***0.0048***	***0.0045***	***0.0048***	***0.0050***	***0.0050***	***0.0053***	***0.0056***	***0.0054***	***0.0045***	***0.0037***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.19E-03	8.91E-04	6.30E-04	4.96E-04	4.22E-04	7.81E-04	1.72E-03	3.23E-03	4.24E-03	4.09E-03	3.87E-03	3.72E-03	3.20E-03	3.02E-03	3.18E-03	3.31E-03	3.31E-03	3.54E-03	3.76E-03	3.60E-03	2.97E-03	2.50E-03	2.32E-03	2.02E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.97E-04	4.46E-04	3.15E-04	2.48E-04	2.11E-04	3.91E-04	8.61E-04	1.62E-03	2.12E-03	2.04E-03	1.94E-03	1.86E-03	1.60E-03	1.51E-03	1.59E-03	1.66E-03	1.65E-03	1.77E-03	1.88E-03	1.80E-03	1.48E-03	1.25E-03	1.16E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	3.98E-04	2.97E-04	2.10E-04	1.65E-04	1.41E-04	2.60E-04	5.74E-04	1.08E-03	1.41E-03	1.36E-03	1.29E-03	1.24E-03	1.07E-03	1.01E-03	1.06E-03	1.10E-03	1.10E-03	1.18E-03	1.25E-03	1.20E-03	9.90E-04	8.32E-04	7.74E-04	6.74E-04
	Emission in each Box of 2nd jet	g/s	1.99E-04	1.49E-04	1.05E-04	8.26E-05	7.03E-05	1.30E-04	2.87E-04	5.38E-04	7.06E-04	6.81E-04	6.46E-04	6.20E-04	5.33E-04	5.03E-04	5.30E-04	5.52E-04	5.52E-04	5.91E-04	6.27E-04	6.00E-04	4.95E-04	4.16E-04	3.87E-04	3.37E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Short-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1752	0.1315	0.1355	0.1504	0.1606	0.3728	0.3996	0.2645	0.1976	0.1948	0.1994	0.2031	0.1655	0.1678	0.1648	0.1644	0.1602	0.1617	0.1592	0.1556	0.1594	0.1704	0.1708	0.1657
	NO2	g/vehicle/km	0.0255	0.0237	0.0242	0.0255	0.0258	0.0375	0.0386	0.0305	0.0270	0.0269	0.0276	0.0278	0.0272	0.0273	0.0271	0.0270	0.0261	0.0262	0.0260	0.0259	0.0261	0.0267	0.0266	0.0264
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0127***	***0.0077***	***0.0055***	***0.0046***	***0.0041***	***0.0119***	***0.0274***	***0.0433***	***0.0477***	***0.0455***	***0.0430***	***0.0420***	***0.0299***	***0.0284***	***0.0296***	***0.0310***	***0.0314***	***0.0342***	***0.0356***	***0.0334***	***0.0281***	***0.0246***	***0.0230***	***0.0197***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.45E-03	5.13E-03	3.65E-03	3.04E-03	2.71E-03	7.96E-03	1.83E-02	2.89E-02	3.18E-02	3.04E-02	2.86E-02	2.80E-02	2.00E-02	1.90E-02	1.98E-02	2.07E-02	2.10E-02	2.28E-02	2.37E-02	2.22E-02	1.87E-02	1.64E-02	1.53E-02	1.31E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.23E-03	2.56E-03	1.83E-03	1.52E-03	1.35E-03	3.98E-03	9.13E-03	1.44E-02	1.59E-02	1.52E-02	1.43E-02	1.40E-02	9.98E-03	9.48E-03	9.88E-03	1.03E-02	1.05E-02	1.14E-02	1.19E-02	1.11E-02	9.35E-03	8.19E-03	7.67E-03	6.57E-03
	Emission in each Box of 1st jet	g/s	2.82E-03	1.71E-03	1.22E-03	1.01E-03	9.03E-04	2.65E-03	6.09E-03	9.62E-03	1.06E-02	1.01E-02	9.55E-03	9.32E-03	6.65E-03	6.32E-03	6.58E-03	6.89E-03	6.98E-03	7.59E-03	7.90E-03	7.41E-03	6.23E-03	5.46E-03	5.11E-03	4.38E-03
	Emission in each Box of 2nd jet	g/s	1.41E-03	8.54E-04	6.09E-04	5.06E-04	4.51E-04	1.33E-03	3.04E-03	4.81E-03	5.30E-03	5.06E-03	4.77E-03	4.66E-03	3.33E-03	3.16E-03	3.29E-03	3.44E-03	3.49E-03	3.80E-03	3.95E-03	3.71E-03	3.12E-03	2.73E-03	2.56E-03	2.19E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0008***	***0.0007***	***0.0012***	***0.0026***	***0.0050***	***0.0065***	***0.0063***	***0.0060***	***0.0058***	***0.0049***	***0.0046***	***0.0049***	***0.0051***	***0.0051***	***0.0055***	***0.0058***	***0.0055***	***0.0046***	***0.0039***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.23E-03	9.23E-04	6.53E-04	5.14E-04	4.35E-04	8.01E-04	1.77E-03	3.33E-03	4.34E-03	4.19E-03	3.97E-03	3.83E-03	3.28E-03	3.09E-03	3.25E-03	3.39E-03	3.41E-03	3.69E-03	3.87E-03	3.70E-03	3.06E-03	2.57E-03	2.39E-03	2.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.16E-04	4.62E-04	3.26E-04	2.57E-04	2.18E-04	4.01E-04	8.83E-04	1.66E-03	2.17E-03	2.09E-03	1.98E-03	1.92E-03	1.64E-03	1.54E-03	1.62E-03	1.70E-03	1.71E-03	1.84E-03	1.93E-03	1.85E-03	1.53E-03	1.28E-03	1.19E-03	1.04E-03
	Emission in each Box of 1st jet	g/s	4.11E-04	3.08E-04	2.18E-04	1.71E-04	1.45E-04	2.67E-04	5.88E-04	1.11E-03	1.45E-03	1.40E-03	1.32E-03	1.28E-03	1.09E-03	1.03E-03	1.08E-03	1.13E-03	1.14E-03	1.23E-03	1.29E-03	1.23E-03	1.02E-03	8.56E-04	7.96E-04	6.97E-04
	Emission in each Box of 2nd jet	g/s	2.05E-04	1.54E-04	1.09E-04	8.56E-05	7.25E-05	1.34E-04	2.94E-04	5.55E-04	7.24E-04	6.98E-04	6.61E-04	6.39E-04	5.46E-04	5.14E-04	5.42E-04	5.66E-04	5.69E-04	6.15E-04	6.45E-04	6.16E-04	5.09E-04	4.28E-04	3.98E-04	3.48E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2459	0.2064	0.2086	0.2186	0.2264	0.4297	0.4578	0.3935	0.4255	0.3933	0.3853	0.3765	0.3601	0.3399	0.3545	0.3706	0.3680	0.3919	0.4181	0.3817	0.3515	0.3227	0.3165	0.2990
	NO2	g/vehicle/km	0.0439	0.0423	0.0418	0.0430	0.0440	0.0550	0.0562	0.0598	0.0769	0.0708	0.0693	0.0670	0.0709	0.0665	0.0699	0.0730	0.0720	0.0774	0.0836	0.0766	0.0687	0.0611	0.0593	0.0568
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0135***	***0.0092***	***0.0064***	***0.0050***	***0.0043***	***0.0101***	***0.0231***	***0.0484***	***0.0778***	***0.0697***	***0.0629***	***0.0588***	***0.0532***	***0.0469***	***0.0520***	***0.0570***	***0.0591***	***0.0678***	***0.0764***	***0.0670***	***0.0506***	***0.0381***	***0.0349***	***0.0291***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.02E-03	6.14E-03	4.27E-03	3.33E-03	2.89E-03	6.76E-03	1.54E-02	3.23E-02	5.19E-02	4.65E-02	4.19E-02	3.92E-02	3.55E-02	3.13E-02	3.46E-02	3.80E-02	3.94E-02	4.52E-02	5.09E-02	4.47E-02	3.37E-02	2.54E-02	2.33E-02	1.94E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.51E-03	3.07E-03	2.14E-03	1.66E-03	1.45E-03	3.38E-03	7.69E-03	1.61E-02	2.59E-02	2.32E-02	2.10E-02	1.96E-02	1.77E-02	1.56E-02	1.73E-02	1.90E-02	1.97E-02	2.26E-02	2.55E-02	2.23E-02	1.69E-02	1.27E-02	1.16E-02	9.70E-03
	Emission in each Box of 1st jet	g/s	1.29E-03	8.78E-04	6.10E-04	4.75E-04	4.13E-04	9.65E-04	2.20E-03	4.61E-03	7.41E-03	6.64E-03	5.99E-03	5.60E-03	5.07E-03	4.47E-03	4.95E-03	5.43E-03	5.63E-03	6.45E-03	7.28E-03	6.38E-03	4.82E-03	3.63E-03	3.32E-03	2.77E-03
	Emission in each Box of 2nd jet	g/s	2.26E-03	1.54E-03	1.07E-03	8.32E-04	7.23E-04	1.69E-03	3.84E-03	8.07E-03	1.30E-02	1.16E-02	1.05E-02	9.80E-03	8.87E-03	7.82E-03	8.66E-03	9.51E-03	9.85E-03	1.13E-02	1.27E-02	1.12E-02	8.44E-03	6.35E-03	5.82E-03	4.85E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0013***	***0.0028***	***0.0074***	***0.0141***	***0.0126***	***0.0113***	***0.0105***	***0.0105***	***0.0092***	***0.0102***	***0.0112***	***0.0116***	***0.0134***	***0.0153***	***0.0135***	***0.0099***	***0.0072***	***0.0065***	***0.0055***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.61E-03	1.26E-03	8.57E-04	6.55E-04	5.63E-04	8.65E-04	1.89E-03	4.90E-03	9.38E-03	8.37E-03	7.54E-03	6.97E-03	6.98E-03	6.12E-03	6.83E-03	7.49E-03	7.71E-03	8.92E-03	1.02E-02	8.97E-03	6.60E-03	4.81E-03	4.36E-03	3.69E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.06E-04	6.30E-04	4.28E-04	3.27E-04	2.81E-04	4.33E-04	9.44E-04	2.45E-03	4.69E-03	4.19E-03	3.77E-03	3.49E-03	3.49E-03	3.06E-03	3.41E-03	3.75E-03	3.85E-03	4.46E-03	5.09E-03	4.48E-03	3.30E-03	2.40E-03	2.18E-03	1.84E-03
	Emission in each Box of 1st jet	g/s	2.30E-04	1.80E-04	1.22E-04	9.35E-05	8.04E-05	1.24E-04	2.70E-04	7.01E-04	1.34E-03	1.20E-03	1.08E-03	9.96E-04	9.97E-04	8.74E-04	9.76E-04	1.07E-03	1.10E-03	1.27E-03	1.46E-03	1.28E-03	9.42E-04	6.87E-04	6.23E-04	5.26E-04
	Emission in each Box of 2nd jet	g/s	4.03E-04	3.15E-04	2.14E-04	1.64E-04	1.41E-04	2.16E-04	4.72E-04	1.23E-03	2.34E-03	2.09E-03	1.88E-03	1.74E-03	1.75E-03	1.53E-03	1.71E-03	1.87E-03	1.93E-03	2.23E-03	2.55E-03	2.24E-03	1.65E-03	1.20E-03	1.09E-03	9.21E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2300	0.1912	0.1927	0.2042	0.2112	0.4021	0.4246	0.3685	0.3949	0.3605	0.3556	0.3474	0.3324	0.3161	0.3323	0.3444	0.3416	0.3658	0.3899	0.3583	0.3297	0.3032	0.2940	0.2776
	NO2	g/vehicle/km	0.0414	0.0396	0.0391	0.0405	0.0414	0.0517	0.0524	0.0562	0.0718	0.0654	0.0643	0.0621	0.0658	0.0622	0.0658	0.0682	0.0672	0.0726	0.0784	0.0724	0.0647	0.0578	0.0555	0.0531
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0127***	***0.0085***	***0.0059***	***0.0047***	***0.0040***	***0.0095***	***0.0214***	***0.0454***	***0.0722***	***0.0639***	***0.0580***	***0.0542***	***0.0491***	***0.0436***	***0.0487***	***0.0530***	***0.0548***	***0.0632***	***0.0713***	***0.0629***	***0.0475***	***0.0358***	***0.0324***	***0.0270***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.44E-03	5.69E-03	3.94E-03	3.11E-03	2.70E-03	6.32E-03	1.43E-02	3.02E-02	4.82E-02	4.26E-02	3.87E-02	3.62E-02	3.28E-02	2.91E-02	3.25E-02	3.53E-02	3.66E-02	4.22E-02	4.75E-02	4.19E-02	3.17E-02	2.38E-02	2.16E-02	1.80E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.22E-03	2.85E-03	1.97E-03	1.55E-03	1.35E-03	3.16E-03	7.13E-03	1.51E-02	2.41E-02	2.13E-02	1.93E-02	1.81E-02	1.64E-02	1.45E-02	1.62E-02	1.77E-02	1.83E-02	2.11E-02	2.38E-02	2.10E-02	1.58E-02	1.19E-02	1.08E-02	9.00E-03
	Emission in each Box of 1st jet	g/s	1.21E-03	8.13E-04	5.64E-04	4.44E-04	3.86E-04	9.03E-04	2.04E-03	4.32E-03	6.88E-03	6.09E-03	5.52E-03	5.17E-03	4.68E-03	4.16E-03	4.64E-03	5.05E-03	5.22E-03	6.02E-03	6.79E-03	5.99E-03	4.52E-03	3.41E-03	3.09E-03	2.57E-03
	Emission in each Box of 2nd jet	g/s	2.11E-03	1.42E-03	9.86E-04	7.77E-04	6.75E-04	1.58E-03	3.57E-03	7.56E-03	1.20E-02	1.07E-02	9.67E-03	9.04E-03	8.19E-03	7.27E-03	8.12E-03	8.84E-03	9.14E-03	1.05E-02	1.19E-02	1.05E-02	7.91E-03	5.96E-03	5.40E-03	4.50E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0026***	***0.0069***	***0.0131***	***0.0116***	***0.0105***	***0.0097***	***0.0097***	***0.0086***	***0.0096***	***0.0105***	***0.0108***	***0.0125***	***0.0143***	***0.0127***	***0.0093***	***0.0068***	***0.0061***	***0.0052***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.52E-03	1.18E-03	8.00E-04	6.17E-04	5.29E-04	8.13E-04	1.76E-03	4.62E-03	8.76E-03	7.73E-03	7.00E-03	6.47E-03	6.48E-03	5.72E-03	6.43E-03	7.00E-03	7.19E-03	8.37E-03	9.55E-03	8.47E-03	6.22E-03	4.54E-03	4.08E-03	3.45E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.60E-04	5.89E-04	4.00E-04	3.08E-04	2.65E-04	4.07E-04	8.81E-04	2.31E-03	4.38E-03	3.87E-03	3.50E-03	3.23E-03	3.24E-03	2.86E-03	3.21E-03	3.50E-03	3.60E-03	4.18E-03	4.78E-03	4.23E-03	3.11E-03	2.27E-03	2.04E-03	1.72E-03
	Emission in each Box of 1st jet	g/s	2.17E-04	1.68E-04	1.14E-04	8.81E-05	7.56E-05	1.16E-04	2.52E-04	6.59E-04	1.25E-03	1.10E-03	9.99E-04	9.24E-04	9.26E-04	8.18E-04	9.18E-04	1.00E-03	1.03E-03	1.20E-03	1.36E-03	1.21E-03	8.88E-04	6.49E-04	5.83E-04	4.92E-04
	Emission in each Box of 2nd jet	g/s	3.80E-04	2.94E-04	2.00E-04	1.54E-04	1.32E-04	2.03E-04	4.40E-04	1.15E-03	2.19E-03	1.93E-03	1.75E-03	1.62E-03	1.62E-03	1.43E-03	1.61E-03	1.75E-03	1.80E-03	2.09E-03	2.39E-03	2.12E-03	1.55E-03	1.14E-03	1.02E-03	8.61E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2171	0.1806	0.1824	0.1905	0.1970	0.3769	0.3990	0.3469	0.3727	0.3434	0.3348	0.3315	0.3173	0.2972	0.3125	0.3277	0.3216	0.3462	0.3716	0.3387	0.3104	0.2853	0.2765	0.2617
	NO2	g/vehicle/km	0.0393	0.0377	0.0372	0.0382	0.0390	0.0487	0.0495	0.0532	0.0681	0.0625	0.0608	0.0595	0.0629	0.0587	0.0620	0.0650	0.0634	0.0689	0.0750	0.0687	0.0612	0.0546	0.0524	0.0503
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0120***	***0.0081***	***0.0056***	***0.0043***	***0.0038***	***0.0089***	***0.0201***	***0.0427***	***0.0682***	***0.0609***	***0.0546***	***0.0518***	***0.0469***	***0.0410***	***0.0458***	***0.0504***	***0.0516***	***0.0599***	***0.0679***	***0.0594***	***0.0447***	***0.0337***	***0.0305***	***0.0255***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.97E-03	5.37E-03	3.73E-03	2.90E-03	2.52E-03	5.93E-03	1.34E-02	2.85E-02	4.54E-02	4.06E-02	3.64E-02	3.45E-02	3.13E-02	2.73E-02	3.05E-02	3.36E-02	3.44E-02	3.99E-02	4.53E-02	3.96E-02	2.98E-02	2.24E-02	2.03E-02	1.70E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.98E-03	2.69E-03	1.87E-03	1.45E-03	1.26E-03	2.96E-03	6.70E-03	1.42E-02	2.27E-02	2.03E-02	1.82E-02	1.73E-02	1.56E-02	1.37E-02	1.53E-02	1.68E-02	1.72E-02	2.00E-02	2.26E-02	1.98E-02	1.49E-02	1.12E-02	1.02E-02	8.49E-03
	Emission in each Box of 1st jet	g/s	1.14E-03	7.68E-04	5.33E-04	4.14E-04	3.60E-04	8.47E-04	1.91E-03	4.07E-03	6.49E-03	5.80E-03	5.20E-03	4.93E-03	4.47E-03	3.91E-03	4.36E-03	4.80E-03	4.92E-03	5.70E-03	6.47E-03	5.66E-03	4.26E-03	3.21E-03	2.90E-03	2.43E-03
	Emission in each Box of 2nd jet	g/s	1.99E-03	1.34E-03	9.34E-04	7.25E-04	6.29E-04	1.48E-03	3.35E-03	7.12E-03	1.14E-02	1.01E-02	9.10E-03	8.63E-03	7.82E-03	6.84E-03	7.63E-03	8.41E-03	8.61E-03	9.98E-03	1.13E-02	9.91E-03	7.45E-03	5.61E-03	5.08E-03	4.24E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0011***	***0.0009***	***0.0007***	***0.0011***	***0.0025***	***0.0066***	***0.0125***	***0.0111***	***0.0099***	***0.0093***	***0.0093***	***0.0081***	***0.0091***	***0.0100***	***0.0102***	***0.0119***	***0.0137***	***0.0120***	***0.0088***	***0.0064***	***0.0058***	***0.0049***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.44E-03	1.12E-03	7.62E-04	5.81E-04	4.99E-04	7.66E-04	1.66E-03	4.37E-03	8.30E-03	7.39E-03	6.61E-03	6.19E-03	6.20E-03	5.40E-03	6.06E-03	6.67E-03	6.79E-03	7.95E-03	9.13E-03	8.03E-03	5.88E-03	4.29E-03	3.86E-03	3.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.21E-04	5.60E-04	3.81E-04	2.90E-04	2.49E-04	3.83E-04	8.32E-04	2.18E-03	4.15E-03	3.69E-03	3.31E-03	3.09E-03	3.10E-03	2.70E-03	3.03E-03	3.34E-03	3.40E-03	3.97E-03	4.57E-03	4.02E-03	2.94E-03	2.15E-03	1.93E-03	1.63E-03
	Emission in each Box of 1st jet	g/s	2.06E-04	1.60E-04	1.09E-04	8.30E-05	7.12E-05	1.09E-04	2.38E-04	6.24E-04	1.19E-03	1.06E-03	9.45E-04	8.84E-04	8.86E-04	7.71E-04	8.66E-04	9.53E-04	9.70E-04	1.14E-03	1.30E-03	1.15E-03	8.40E-04	6.13E-04	5.51E-04	4.66E-04
	Emission in each Box of 2nd jet	g/s	3.61E-04	2.80E-04	1.91E-04	1.45E-04	1.25E-04	1.92E-04	4.16E-04	1.09E-03	2.08E-03	1.85E-03	1.65E-03	1.55E-03	1.55E-03	1.35E-03	1.52E-03	1.67E-03	1.70E-03	1.99E-03	2.28E-03	2.01E-03	1.47E-03	1.07E-03	9.64E-04	8.16E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2040	0.1694	0.1704	0.1822	0.1885	0.3627	0.3840	0.3307	0.3552	0.3274	0.3189	0.3152	0.3018	0.2873	0.3021	0.3114	0.3119	0.3297	0.3541	0.3211	0.2947	0.2752	0.2657	0.2505
	NO2	g/vehicle/km	0.0372	0.0356	0.0351	0.0367	0.0375	0.0470	0.0478	0.0509	0.0650	0.0597	0.0580	0.0566	0.0600	0.0568	0.0601	0.0620	0.0616	0.0657	0.0716	0.0653	0.0584	0.0528	0.0505	0.0483
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0112***	***0.0076***	***0.0052***	***0.0042***	***0.0036***	***0.0086***	***0.0193***	***0.0407***	***0.0650***	***0.0581***	***0.0520***	***0.0492***	***0.0446***	***0.0397***	***0.0443***	***0.0479***	***0.0501***	***0.0570***	***0.0647***	***0.0563***	***0.0425***	***0.0325***	***0.0293***	***0.0244***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.48E-03	5.04E-03	3.49E-03	2.77E-03	2.41E-03	5.70E-03	1.29E-02	2.71E-02	4.33E-02	3.87E-02	3.47E-02	3.28E-02	2.97E-02	2.64E-02	2.95E-02	3.19E-02	3.34E-02	3.80E-02	4.31E-02	3.76E-02	2.83E-02	2.16E-02	1.95E-02	1.62E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.74E-03	2.52E-03	1.74E-03	1.39E-03	1.20E-03	2.85E-03	6.45E-03	1.36E-02	2.17E-02	1.94E-02	1.73E-02	1.64E-02	1.49E-02	1.32E-02	1.48E-02	1.60E-02	1.67E-02	1.90E-02	2.16E-02	1.88E-02	1.42E-02	1.08E-02	9.77E-03	8.12E-03
	Emission in each Box of 1st jet	g/s	1.07E-03	7.20E-04	4.98E-04	3.96E-04	3.44E-04	8.15E-04	1.84E-03	3.88E-03	6.19E-03	5.53E-03	4.95E-03	4.69E-03	4.25E-03	3.78E-03	4.22E-03	4.56E-03	4.77E-03	5.43E-03	6.16E-03	5.37E-03	4.04E-03	3.09E-03	2.79E-03	2.32E-03
	Emission in each Box of 2nd jet	g/s	1.87E-03	1.26E-03	8.72E-04	6.93E-04	6.02E-04	1.43E-03	3.22E-03	6.78E-03	1.08E-02	9.68E-03	8.67E-03	8.20E-03	7.44E-03	6.61E-03	7.38E-03	7.99E-03	8.35E-03	9.50E-03	1.08E-02	9.39E-03	7.08E-03	5.41E-03	4.88E-03	4.06E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0024***	***0.0063***	***0.0119***	***0.0106***	***0.0095***	***0.0088***	***0.0089***	***0.0078***	***0.0088***	***0.0095***	***0.0099***	***0.0114***	***0.0131***	***0.0115***	***0.0084***	***0.0062***	***0.0056***	***0.0047***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.36E-03	1.06E-03	7.18E-04	5.59E-04	4.80E-04	7.40E-04	1.61E-03	4.17E-03	7.93E-03	7.06E-03	6.31E-03	5.90E-03	5.91E-03	5.23E-03	5.87E-03	6.36E-03	6.60E-03	7.58E-03	8.72E-03	7.63E-03	5.60E-03	4.15E-03	3.71E-03	3.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.82E-04	5.30E-04	3.59E-04	2.79E-04	2.40E-04	3.70E-04	8.03E-04	2.09E-03	3.96E-03	3.53E-03	3.15E-03	2.95E-03	2.96E-03	2.61E-03	2.93E-03	3.18E-03	3.30E-03	3.79E-03	4.36E-03	3.82E-03	2.80E-03	2.07E-03	1.86E-03	1.57E-03
	Emission in each Box of 1st jet	g/s	1.95E-04	1.51E-04	1.03E-04	7.98E-05	6.85E-05	1.06E-04	2.29E-04	5.96E-04	1.13E-03	1.01E-03	9.01E-04	8.42E-04	8.45E-04	7.47E-04	8.38E-04	9.08E-04	9.42E-04	1.08E-03	1.25E-03	1.09E-03	8.01E-04	5.93E-04	5.30E-04	4.47E-04
	Emission in each Box of 2nd jet	g/s	3.41E-04	2.65E-04	1.79E-04	1.40E-04	1.20E-04	1.85E-04	4.01E-04	1.04E-03	1.98E-03	1.76E-03	1.58E-03	1.47E-03	1.48E-03	1.31E-03	1.47E-03	1.59E-03	1.65E-03	1.89E-03	2.18E-03	1.91E-03	1.40E-03	1.04E-03	9.28E-04	7.83E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1834	0.1512	0.1526	0.1589	0.1644	0.3168	0.3315	0.2876	0.3131	0.2870	0.2843	0.2805	0.2704	0.2562	0.2713	0.2784	0.2780	0.2982	0.3126	0.2885	0.2643	0.2401	0.2335	0.2197
	NO2	g/vehicle/km	0.0336	0.0321	0.0317	0.0324	0.0331	0.0414	0.0415	0.0445	0.0576	0.0526	0.0520	0.0506	0.0540	0.0509	0.0542	0.0556	0.0552	0.0597	0.0635	0.0589	0.0526	0.0464	0.0447	0.0426
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0101***	***0.0068***	***0.0047***	***0.0036***	***0.0032***	***0.0075***	***0.0167***	***0.0354***	***0.0573***	***0.0509***	***0.0464***	***0.0438***	***0.0400***	***0.0354***	***0.0398***	***0.0429***	***0.0446***	***0.0516***	***0.0571***	***0.0506***	***0.0381***	***0.0283***	***0.0257***	***0.0214***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.73E-03	4.50E-03	3.12E-03	2.42E-03	2.10E-03	4.98E-03	1.11E-02	2.36E-02	3.82E-02	3.39E-02	3.09E-02	2.92E-02	2.66E-02	2.36E-02	2.65E-02	2.86E-02	2.98E-02	3.44E-02	3.81E-02	3.37E-02	2.54E-02	1.89E-02	1.72E-02	1.43E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.37E-03	2.25E-03	1.56E-03	1.21E-03	1.05E-03	2.49E-03	5.57E-03	1.18E-02	1.91E-02	1.70E-02	1.55E-02	1.46E-02	1.33E-02	1.18E-02	1.33E-02	1.43E-02	1.49E-02	1.72E-02	1.90E-02	1.69E-02	1.27E-02	9.44E-03	8.58E-03	7.13E-03
	Emission in each Box of 1st jet	g/s	9.62E-04	6.43E-04	4.46E-04	3.45E-04	3.00E-04	7.12E-04	1.59E-03	3.37E-03	5.45E-03	4.85E-03	4.42E-03	4.17E-03	3.81E-03	3.37E-03	3.79E-03	4.08E-03	4.25E-03	4.91E-03	5.44E-03	4.82E-03	3.63E-03	2.70E-03	2.45E-03	2.04E-03
	Emission in each Box of 2nd jet	g/s	1.68E-03	1.13E-03	7.81E-04	6.04E-04	5.25E-04	1.25E-03	2.78E-03	5.90E-03	9.55E-03	8.48E-03	7.73E-03	7.30E-03	6.66E-03	5.89E-03	6.63E-03	7.14E-03	7.44E-03	8.59E-03	9.52E-03	8.44E-03	6.35E-03	4.72E-03	4.29E-03	3.56E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0010***	***0.0021***	***0.0055***	***0.0105***	***0.0093***	***0.0085***	***0.0079***	***0.0080***	***0.0070***	***0.0079***	***0.0086***	***0.0089***	***0.0103***	***0.0116***	***0.0103***	***0.0076***	***0.0055***	***0.0049***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.23E-03	9.54E-04	6.49E-04	4.93E-04	4.23E-04	6.50E-04	1.39E-03	3.65E-03	7.03E-03	6.22E-03	5.65E-03	5.27E-03	5.32E-03	4.68E-03	5.29E-03	5.71E-03	5.91E-03	6.88E-03	7.74E-03	6.89E-03	5.05E-03	3.65E-03	3.28E-03	2.76E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.17E-04	4.77E-04	3.24E-04	2.46E-04	2.11E-04	3.25E-04	6.97E-04	1.83E-03	3.51E-03	3.11E-03	2.83E-03	2.63E-03	2.66E-03	2.34E-03	2.65E-03	2.85E-03	2.95E-03	3.44E-03	3.87E-03	3.45E-03	2.52E-03	1.82E-03	1.64E-03	1.38E-03
	Emission in each Box of 1st jet	g/s	1.76E-04	1.36E-04	9.27E-05	7.04E-05	6.04E-05	9.29E-05	1.99E-04	5.22E-04	1.00E-03	8.89E-04	8.07E-04	7.53E-04	7.60E-04	6.69E-04	7.56E-04	8.15E-04	8.44E-04	9.83E-04	1.11E-03	9.85E-04	7.21E-04	5.21E-04	4.69E-04	3.95E-04
	Emission in each Box of 2nd jet	g/s	3.09E-04	2.39E-04	1.62E-04	1.23E-04	1.06E-04	1.63E-04	3.49E-04	9.13E-04	1.76E-03	1.56E-03	1.41E-03	1.32E-03	1.33E-03	1.17E-03	1.32E-03	1.43E-03	1.48E-03	1.72E-03	1.93E-03	1.72E-03	1.26E-03	9.12E-04	8.21E-04	6.91E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1771	0.1467	0.1518	0.1580	0.1626	0.3134	0.3238	0.2841	0.3063	0.2865	0.2754	0.2717	0.2603	0.2482	0.2593	0.2698	0.2736	0.2912	0.3069	0.2852	0.2614	0.2387	0.2308	0.2184
	NO2	g/vehicle/km	0.0325	0.0311	0.0315	0.0322	0.0328	0.0409	0.0406	0.0441	0.0565	0.0526	0.0504	0.0491	0.0520	0.0494	0.0519	0.0540	0.0544	0.0584	0.0624	0.0583	0.0520	0.0461	0.0442	0.0424
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0097***	***0.0066***	***0.0047***	***0.0036***	***0.0031***	***0.0074***	***0.0163***	***0.0350***	***0.0560***	***0.0508***	***0.0449***	***0.0424***	***0.0385***	***0.0343***	***0.0380***	***0.0415***	***0.0439***	***0.0503***	***0.0561***	***0.0501***	***0.0376***	***0.0282***	***0.0255***	***0.0213***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.50E-03	4.37E-03	3.11E-03	2.40E-03	2.08E-03	4.93E-03	1.09E-02	2.33E-02	3.74E-02	3.39E-02	3.00E-02	2.83E-02	2.56E-02	2.28E-02	2.53E-02	2.77E-02	2.93E-02	3.36E-02	3.74E-02	3.34E-02	2.51E-02	1.88E-02	1.70E-02	1.42E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.25E-03	2.18E-03	1.55E-03	1.20E-03	1.04E-03	2.46E-03	5.44E-03	1.17E-02	1.87E-02	1.69E-02	1.50E-02	1.41E-02	1.28E-02	1.14E-02	1.27E-02	1.38E-02	1.46E-02	1.68E-02	1.87E-02	1.67E-02	1.25E-02	9.39E-03	8.48E-03	7.08E-03
	Emission in each Box of 1st jet	g/s	9.29E-04	6.24E-04	4.44E-04	3.43E-04	2.97E-04	7.04E-04	1.55E-03	3.33E-03	5.34E-03	4.84E-03	4.28E-03	4.04E-03	3.66E-03	3.26E-03	3.62E-03	3.95E-03	4.18E-03	4.79E-03	5.34E-03	4.77E-03	3.59E-03	2.68E-03	2.42E-03	2.02E-03
	Emission in each Box of 2nd jet	g/s	1.62E-03	1.09E-03	7.77E-04	6.01E-04	5.19E-04	1.23E-03	2.72E-03	5.83E-03	9.34E-03	8.47E-03	7.49E-03	7.07E-03	6.41E-03	5.71E-03	6.33E-03	6.92E-03	7.32E-03	8.39E-03	9.35E-03	8.34E-03	6.27E-03	4.69E-03	4.24E-03	3.54E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0010***	***0.0020***	***0.0054***	***0.0103***	***0.0093***	***0.0082***	***0.0077***	***0.0077***	***0.0068***	***0.0076***	***0.0083***	***0.0087***	***0.0101***	***0.0114***	***0.0102***	***0.0075***	***0.0054***	***0.0049***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.19E-03	9.26E-04	6.45E-04	4.90E-04	4.19E-04	6.44E-04	1.36E-03	3.61E-03	6.89E-03	6.22E-03	5.48E-03	5.11E-03	5.13E-03	4.54E-03	5.07E-03	5.54E-03	5.82E-03	6.73E-03	7.61E-03	6.82E-03	4.99E-03	3.63E-03	3.25E-03	2.75E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.96E-04	4.63E-04	3.22E-04	2.45E-04	2.09E-04	3.22E-04	6.82E-04	1.81E-03	3.44E-03	3.11E-03	2.74E-03	2.56E-03	2.56E-03	2.27E-03	2.53E-03	2.77E-03	2.91E-03	3.37E-03	3.80E-03	3.41E-03	2.50E-03	1.81E-03	1.62E-03	1.38E-03
	Emission in each Box of 1st jet	g/s	1.70E-04	1.32E-04	9.21E-05	7.00E-05	5.98E-05	9.20E-05	1.95E-04	5.16E-04	9.84E-04	8.88E-04	7.83E-04	7.30E-04	7.32E-04	6.49E-04	7.24E-04	7.91E-04	8.32E-04	9.62E-04	1.09E-03	9.74E-04	7.13E-04	5.18E-04	4.64E-04	3.93E-04
	Emission in each Box of 2nd jet	g/s	2.98E-04	2.31E-04	1.61E-04	1.23E-04	1.05E-04	1.61E-04	3.41E-04	9.04E-04	1.72E-03	1.55E-03	1.37E-03	1.28E-03	1.28E-03	1.14E-03	1.27E-03	1.38E-03	1.46E-03	1.68E-03	1.90E-03	1.71E-03	1.25E-03	9.06E-04	8.12E-04	6.88E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1782	0.1459	0.1472	0.1530	0.1584	0.3038	0.3238	0.2771	0.2990	0.2771	0.2765	0.2747	0.2555	0.2439	0.2622	0.2709	0.2687	0.2902	0.3036	0.2820	0.2568	0.2358	0.2279	0.2130
	NO2	g/vehicle/km	0.0327	0.0309	0.0306	0.0313	0.0320	0.0398	0.0406	0.0430	0.0552	0.0509	0.0507	0.0497	0.0511	0.0485	0.0525	0.0542	0.0534	0.0582	0.0618	0.0577	0.0511	0.0456	0.0437	0.0414
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0098***	***0.0065***	***0.0045***	***0.0035***	***0.0030***	***0.0072***	***0.0163***	***0.0341***	***0.0547***	***0.0491***	***0.0451***	***0.0429***	***0.0378***	***0.0337***	***0.0384***	***0.0417***	***0.0431***	***0.0502***	***0.0555***	***0.0495***	***0.0370***	***0.0278***	***0.0251***	***0.0207***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.54E-03	4.34E-03	3.01E-03	2.33E-03	2.02E-03	4.78E-03	1.09E-02	2.27E-02	3.65E-02	3.28E-02	3.01E-02	2.86E-02	2.52E-02	2.24E-02	2.56E-02	2.78E-02	2.88E-02	3.34E-02	3.70E-02	3.30E-02	2.47E-02	1.85E-02	1.68E-02	1.38E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.27E-03	2.17E-03	1.51E-03	1.16E-03	1.01E-03	2.39E-03	5.44E-03	1.14E-02	1.82E-02	1.64E-02	1.50E-02	1.43E-02	1.26E-02	1.12E-02	1.28E-02	1.39E-02	1.44E-02	1.67E-02	1.85E-02	1.65E-02	1.23E-02	9.27E-03	8.38E-03	6.91E-03
	Emission in each Box of 1st jet	g/s	9.34E-04	6.20E-04	4.30E-04	3.33E-04	2.89E-04	6.82E-04	1.55E-03	3.25E-03	5.21E-03	4.68E-03	4.30E-03	4.08E-03	3.60E-03	3.21E-03	3.66E-03	3.97E-03	4.11E-03	4.78E-03	5.28E-03	4.71E-03	3.52E-03	2.65E-03	2.39E-03	1.97E-03
	Emission in each Box of 2nd jet	g/s	1.63E-03	1.09E-03	7.53E-04	5.82E-04	5.06E-04	1.19E-03	2.72E-03	5.68E-03	9.12E-03	8.19E-03	7.52E-03	7.15E-03	6.29E-03	5.61E-03	6.40E-03	6.95E-03	7.19E-03	8.36E-03	9.25E-03	8.25E-03	6.16E-03	4.64E-03	4.19E-03	3.45E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0009***	***0.0007***	***0.0006***	***0.0009***	***0.0020***	***0.0053***	***0.0101***	***0.0090***	***0.0083***	***0.0078***	***0.0076***	***0.0067***	***0.0077***	***0.0083***	***0.0086***	***0.0101***	***0.0113***	***0.0101***	***0.0074***	***0.0054***	***0.0048***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.20E-03	9.21E-04	6.27E-04	4.76E-04	4.09E-04	6.25E-04	1.36E-03	3.53E-03	6.73E-03	6.02E-03	5.51E-03	5.17E-03	5.04E-03	4.46E-03	5.13E-03	5.56E-03	5.72E-03	6.70E-03	7.52E-03	6.75E-03	4.91E-03	3.58E-03	3.21E-03	2.69E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.99E-04	4.61E-04	3.13E-04	2.38E-04	2.04E-04	3.13E-04	6.82E-04	1.76E-03	3.37E-03	3.01E-03	2.75E-03	2.58E-03	2.52E-03	2.23E-03	2.56E-03	2.78E-03	2.86E-03	3.35E-03	3.76E-03	3.37E-03	2.45E-03	1.79E-03	1.61E-03	1.34E-03
	Emission in each Box of 1st jet	g/s	1.71E-04	1.32E-04	8.95E-05	6.81E-05	5.84E-05	8.93E-05	1.95E-04	5.04E-04	9.62E-04	8.60E-04	7.87E-04	7.38E-04	7.19E-04	6.38E-04	7.32E-04	7.95E-04	8.17E-04	9.58E-04	1.07E-03	9.64E-04	7.01E-04	5.12E-04	4.59E-04	3.84E-04
	Emission in each Box of 2nd jet	g/s	3.00E-04	2.30E-04	1.57E-04	1.19E-04	1.02E-04	1.56E-04	3.41E-04	8.82E-04	1.68E-03	1.51E-03	1.38E-03	1.29E-03	1.26E-03	1.12E-03	1.28E-03	1.39E-03	1.43E-03	1.68E-03	1.88E-03	1.69E-03	1.23E-03	8.96E-04	8.03E-04	6.71E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1805	0.1488	0.1501	0.1562	0.1616	0.3100	0.3303	0.2841	0.3026	0.2781	0.2809	0.2752	0.2603	0.2482	0.2610	0.2698	0.2753	0.2894	0.3122	0.2820	0.2569	0.2359	0.2281	0.2159
	NO2	g/vehicle/km	0.0331	0.0315	0.0312	0.0319	0.0326	0.0405	0.0414	0.0441	0.0558	0.0511	0.0514	0.0498	0.0520	0.0494	0.0522	0.0540	0.0547	0.0581	0.0635	0.0577	0.0512	0.0456	0.0437	0.0419
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0099***	***0.0066***	***0.0046***	***0.0036***	***0.0031***	***0.0073***	***0.0166***	***0.0350***	***0.0553***	***0.0493***	***0.0458***	***0.0430***	***0.0385***	***0.0343***	***0.0383***	***0.0415***	***0.0442***	***0.0500***	***0.0571***	***0.0495***	***0.0370***	***0.0278***	***0.0252***	***0.0210***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.62E-03	4.43E-03	3.07E-03	2.38E-03	2.07E-03	4.87E-03	1.11E-02	2.33E-02	3.69E-02	3.29E-02	3.06E-02	2.86E-02	2.56E-02	2.28E-02	2.55E-02	2.77E-02	2.95E-02	3.34E-02	3.80E-02	3.30E-02	2.47E-02	1.86E-02	1.68E-02	1.40E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.31E-03	2.21E-03	1.54E-03	1.19E-03	1.03E-03	2.44E-03	5.55E-03	1.17E-02	1.84E-02	1.64E-02	1.53E-02	1.43E-02	1.28E-02	1.14E-02	1.28E-02	1.38E-02	1.47E-02	1.67E-02	1.90E-02	1.65E-02	1.23E-02	9.28E-03	8.38E-03	7.00E-03
	Emission in each Box of 1st jet	g/s	9.46E-04	6.32E-04	4.39E-04	3.40E-04	2.95E-04	6.96E-04	1.58E-03	3.33E-03	5.27E-03	4.70E-03	4.36E-03	4.09E-03	3.66E-03	3.26E-03	3.64E-03	3.95E-03	4.21E-03	4.76E-03	5.43E-03	4.71E-03	3.52E-03	2.65E-03	2.40E-03	2.00E-03
	Emission in each Box of 2nd jet	g/s	1.66E-03	1.11E-03	7.68E-04	5.94E-04	5.16E-04	1.22E-03	2.77E-03	5.83E-03	9.22E-03	8.22E-03	7.64E-03	7.16E-03	6.41E-03	5.71E-03	6.38E-03	6.92E-03	7.37E-03	8.34E-03	9.51E-03	8.25E-03	6.17E-03	4.64E-03	4.19E-03	3.50E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0010***	***0.0021***	***0.0054***	***0.0102***	***0.0091***	***0.0084***	***0.0078***	***0.0077***	***0.0068***	***0.0077***	***0.0083***	***0.0088***	***0.0100***	***0.0116***	***0.0101***	***0.0074***	***0.0054***	***0.0048***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.21E-03	9.38E-04	6.38E-04	4.85E-04	4.17E-04	6.37E-04	1.39E-03	3.61E-03	6.81E-03	6.04E-03	5.59E-03	5.18E-03	5.13E-03	4.54E-03	5.10E-03	5.54E-03	5.86E-03	6.69E-03	7.73E-03	6.75E-03	4.91E-03	3.59E-03	3.21E-03	2.72E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.07E-04	4.69E-04	3.19E-04	2.43E-04	2.08E-04	3.19E-04	6.95E-04	1.81E-03	3.40E-03	3.02E-03	2.80E-03	2.59E-03	2.56E-03	2.27E-03	2.55E-03	2.77E-03	2.93E-03	3.35E-03	3.87E-03	3.37E-03	2.46E-03	1.79E-03	1.61E-03	1.36E-03
	Emission in each Box of 1st jet	g/s	1.73E-04	1.34E-04	9.12E-05	6.93E-05	5.95E-05	9.10E-05	1.99E-04	5.16E-04	9.73E-04	8.62E-04	7.99E-04	7.40E-04	7.32E-04	6.49E-04	7.29E-04	7.91E-04	8.36E-04	9.56E-04	1.10E-03	9.64E-04	7.02E-04	5.12E-04	4.59E-04	3.89E-04
	Emission in each Box of 2nd jet	g/s	3.03E-04	2.35E-04	1.60E-04	1.21E-04	1.04E-04	1.59E-04	3.48E-04	9.04E-04	1.70E-03	1.51E-03	1.40E-03	1.29E-03	1.28E-03	1.14E-03	1.28E-03	1.38E-03	1.46E-03	1.67E-03	1.93E-03	1.69E-03	1.23E-03	8.97E-04	8.03E-04	6.80E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 085A01-085A09
Enclosure Involved: 085P1
Road Located: 085
Vehicle EF Adopted: 085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1792	0.1476	0.1489	0.1540	0.1644	0.3151	0.3339	0.2806	0.3051	0.2811	0.2843	0.2748	0.2632	0.2545	0.2658	0.2765	0.2725	0.2883	0.3106	0.2786	0.2643	0.2415	0.2335	0.2210
	NO2	g/vehicle/km	0.0328	0.0313	0.0309	0.0315	0.0331	0.0412	0.0418	0.0435	0.0562	0.0516	0.0520	0.0496	0.0526	0.0506	0.0531	0.0553	0.0541	0.0578	0.0631	0.0570	0.0526	0.0466	0.0447	0.0429
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0099***	***0.0066***	***0.0046***	***0.0035***	***0.0032***	***0.0074***	***0.0168***	***0.0345***	***0.0558***	***0.0498***	***0.0464***	***0.0429***	***0.0389***	***0.0351***	***0.0390***	***0.0426***	***0.0437***	***0.0498***	***0.0568***	***0.0489***	***0.0381***	***0.0285***	***0.0257***	***0.0215***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.58E-03	4.39E-03	3.05E-03	2.34E-03	2.10E-03	4.95E-03	1.12E-02	2.30E-02	3.72E-02	3.32E-02	3.09E-02	2.86E-02	2.59E-02	2.34E-02	2.60E-02	2.84E-02	2.92E-02	3.32E-02	3.78E-02	3.26E-02	2.54E-02	1.90E-02	1.72E-02	1.43E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.29E-03	2.20E-03	1.52E-03	1.17E-03	1.05E-03	2.48E-03	5.61E-03	1.15E-02	1.86E-02	1.66E-02	1.55E-02	1.43E-02	1.30E-02	1.17E-02	1.30E-02	1.42E-02	1.46E-02	1.66E-02	1.89E-02	1.63E-02	1.27E-02	9.50E-03	8.58E-03	7.17E-03
	Emission in each Box of 1st jet	g/s	9.40E-04	6.28E-04	4.36E-04	3.35E-04	3.00E-04	7.08E-04	1.60E-03	3.29E-03	5.31E-03	4.75E-03	4.42E-03	4.09E-03	3.71E-03	3.35E-03	3.71E-03	4.05E-03	4.17E-03	4.75E-03	5.41E-03	4.66E-03	3.63E-03	2.71E-03	2.45E-03	2.05E-03
	Emission in each Box of 2nd jet	g/s	1.64E-03	1.10E-03	7.62E-04	5.86E-04	5.25E-04	1.24E-03	2.80E-03	5.76E-03	9.30E-03	8.31E-03	7.73E-03	7.15E-03	6.48E-03	5.86E-03	6.49E-03	7.09E-03	7.29E-03	8.31E-03	9.46E-03	8.15E-03	6.35E-03	4.75E-03	4.29E-03	3.58E-03
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0010***	***0.0021***	***0.0054***	***0.0103***	***0.0092***	***0.0085***	***0.0077***	***0.0078***	***0.0070***	***0.0078***	***0.0085***	***0.0087***	***0.0100***	***0.0115***	***0.0100***	***0.0076***	***0.0055***	***0.0049***	***0.0042***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.21E-03	9.31E-04	6.33E-04	4.79E-04	4.23E-04	6.47E-04	1.40E-03	3.57E-03	6.86E-03	6.10E-03	5.65E-03	5.17E-03	5.18E-03	4.65E-03	5.19E-03	5.67E-03	5.79E-03	6.67E-03	7.69E-03	6.67E-03	5.05E-03	3.67E-03	3.28E-03	2.78E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.03E-04	4.66E-04	3.17E-04	2.39E-04	2.11E-04	3.24E-04	7.02E-04	1.79E-03	3.43E-03	3.05E-03	2.83E-03	2.58E-03	2.59E-03	2.33E-03	2.60E-03	2.84E-03	2.90E-03	3.33E-03	3.85E-03	3.33E-03	2.52E-03	1.83E-03	1.64E-03	1.39E-03
	Emission in each Box of 1st jet	g/s	1.72E-04	1.33E-04	9.05E-05	6.84E-05	6.04E-05	9.24E-05	2.01E-04	5.10E-04	9.80E-04	8.72E-04	8.07E-04	7.38E-04	7.40E-04	6.65E-04	7.42E-04	8.10E-04	8.27E-04	9.52E-04	1.10E-03	9.53E-04	7.21E-04	5.24E-04	4.69E-04	3.97E-04
	Emission in each Box of 2nd jet	g/s	3.01E-04	2.33E-04	1.58E-04	1.20E-04	1.06E-04	1.62E-04	3.51E-04	8.93E-04	1.71E-03	1.53E-03	1.41E-03	1.29E-03	1.30E-03	1.16E-03	1.30E-03	1.42E-03	1.45E-03	1.67E-03	1.92E-03	1.67E-03	1.26E-03	9.16E-04	8.21E-04	6.95E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involved	085P1
Road Located	085
Vehicle EF Adopted	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2021	0.1678	0.1687	0.1760	0.1813	0.3481	0.3702	0.3217	0.3455	0.3182	0.3095	0.3063	0.2947	0.2793	0.2936	0.3039	0.3033	0.3202	0.3472	0.3160	0.2912	0.2676	0.2591	0.2442
	NO2	g/vehicle/km	0.0368	0.0352	0.0347	0.0356	0.0362	0.0452	0.0461	0.0496	0.0633	0.0581	0.0564	0.0551	0.0586	0.0552	0.0585	0.0605	0.0600	0.0640	0.0703	0.0643	0.0577	0.0514	0.0493	0.0472
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0111***	***0.0075***	***0.0052***	***0.0040***	***0.0035***	***0.0082***	***0.0187***	***0.0396***	***0.0632***	***0.0564***	***0.0505***	***0.0478***	***0.0436***	***0.0386***	***0.0430***	***0.0468***	***0.0487***	***0.0554***	***0.0635***	***0.0555***	***0.0419***	***0.0316***	***0.0286***	***0.0238***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.42E-03	5.00E-03	3.45E-03	2.68E-03	2.32E-03	5.47E-03	1.24E-02	2.64E-02	4.21E-02	3.76E-02	3.37E-02	3.19E-02	2.90E-02	2.57E-02	2.87E-02	3.12E-02	3.25E-02	3.69E-02	4.23E-02	3.70E-02	2.80E-02	2.11E-02	1.91E-02	1.58E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.71E-03	2.50E-03	1.73E-03	1.34E-03	1.16E-03	2.74E-03	6.22E-03	1.32E-02	2.11E-02	1.88E-02	1.68E-02	1.59E-02	1.45E-02	1.29E-02	1.43E-02	1.56E-02	1.62E-02	1.85E-02	2.12E-02	1.85E-02	1.40E-02	1.05E-02	9.53E-03	7.92E-03
	Emission in each Box of 1st jet	g/s	1.06E-03	7.14E-04	4.93E-04	3.83E-04	3.31E-04	7.82E-04	1.78E-03	3.77E-03	6.02E-03	5.37E-03	4.81E-03	4.55E-03	4.15E-03	3.67E-03	4.10E-03	4.45E-03	4.64E-03	5.27E-03	6.04E-03	5.28E-03	3.99E-03	3.01E-03	2.72E-03	2.26E-03
	Emission in each Box of 2nd jet	g/s	1.85E-03	1.25E-03	8.64E-04	6.70E-04	5.79E-04	1.37E-03	3.11E-03	6.60E-03	1.05E-02	9.40E-03	8.42E-03	7.97E-03	7.26E-03	6.43E-03	7.17E-03	7.80E-03	8.12E-03	9.23E-03	1.06E-02	9.24E-03	6.99E-03	5.26E-03	4.76E-03	3.96E-03
NO_2 Emission Rate		g/s	***0.0020***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0011***	***0.0023***	***0.0061***	***0.0116***	***0.0103***	***0.0092***	***0.0086***	***0.0087***	***0.0076***	***0.0086***	***0.0093***	***0.0096***	***0.0111***	***0.0128***	***0.0113***	***0.0083***	***0.0061***	***0.0054***	***0.0046***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.35E-03	1.05E-03	7.11E-04	5.41E-04	4.63E-04	7.11E-04	1.55E-03	4.07E-03	7.72E-03	6.87E-03	6.14E-03	5.74E-03	5.78E-03	5.08E-03	5.71E-03	6.21E-03	6.43E-03	7.38E-03	8.56E-03	7.52E-03	5.54E-03	4.04E-03	3.63E-03	3.06E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.75E-04	5.24E-04	3.55E-04	2.71E-04	2.31E-04	3.56E-04	7.75E-04	2.03E-03	3.86E-03	3.44E-03	3.07E-03	2.87E-03	2.89E-03	2.54E-03	2.86E-03	3.11E-03	3.21E-03	3.69E-03	4.28E-03	3.76E-03	2.77E-03	2.02E-03	1.81E-03	1.53E-03
	Emission in each Box of 1st jet	g/s	1.93E-04	1.50E-04	1.02E-04	7.73E-05	6.61E-05	1.02E-04	2.21E-04	5.81E-04	1.10E-03	9.82E-04	8.77E-04	8.19E-04	8.25E-04	7.26E-04	8.16E-04	8.88E-04	9.18E-04	1.05E-03	1.22E-03	1.07E-03	7.91E-04	5.78E-04	5.18E-04	4.37E-04
	Emission in each Box of 2nd jet	g/s	3.38E-04	2.62E-04	1.78E-04	1.35E-04	1.16E-04	1.78E-04	3.87E-04	1.02E-03	1.93E-03	1.72E-03	1.53E-03	1.43E-03	1.44E-03	1.27E-03	1.43E-03	1.55E-03	1.61E-03	1.84E-03	2.14E-03	1.88E-03	1.38E-03	1.01E-03	9.07E-04	7.65E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2216	0.1864	0.1877	0.1979	0.2047	0.3922	0.4163	0.3608	0.3886	0.3592	0.3494	0.3436	0.3260	0.3090	0.3249	0.3365	0.3341	0.3588	0.3814	0.3522	0.3229	0.2968	0.2877	0.2723
	NO2	g/vehicle/km	0.0401	0.0388	0.0383	0.0396	0.0405	0.0507	0.0516	0.0553	0.0709	0.0652	0.0633	0.0615	0.0646	0.0609	0.0644	0.0668	0.0658	0.0713	0.0768	0.0712	0.0636	0.0567	0.0544	0.0523
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0122***	***0.0083***	***0.0058***	***0.0045***	***0.0039***	***0.0092***	***0.0210***	***0.0444***	***0.0711***	***0.0637***	***0.0570***	***0.0536***	***0.0482***	***0.0427***	***0.0476***	***0.0518***	***0.0536***	***0.0620***	***0.0697***	***0.0618***	***0.0465***	***0.0350***	***0.0317***	***0.0265***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.13E-03	5.55E-03	3.84E-03	3.01E-03	2.62E-03	6.17E-03	1.40E-02	2.96E-02	4.74E-02	4.25E-02	3.80E-02	3.58E-02	3.21E-02	2.84E-02	3.17E-02	3.45E-02	3.58E-02	4.14E-02	4.65E-02	4.12E-02	3.10E-02	2.33E-02	2.12E-02	1.77E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.07E-03	2.77E-03	1.92E-03	1.51E-03	1.31E-03	3.08E-03	6.99E-03	1.48E-02	2.37E-02	2.12E-02	1.90E-02	1.79E-02	1.61E-02	1.42E-02	1.59E-02	1.73E-02	1.79E-02	2.07E-02	2.32E-02	2.06E-02	1.55E-02	1.17E-02	1.06E-02	8.83E-03
	Emission in each Box of 1st jet	g/s	1.16E-03	7.93E-04	5.49E-04	4.30E-04	3.74E-04	8.81E-04	2.00E-03	4.23E-03	6.77E-03	6.07E-03	5.43E-03	5.11E-03	4.59E-03	4.06E-03	4.53E-03	4.93E-03	5.11E-03	5.91E-03	6.64E-03	5.89E-03	4.43E-03	3.34E-03	3.02E-03	2.52E-03
	Emission in each Box of 2nd jet	g/s	2.03E-03	1.39E-03	9.61E-04	7.53E-04	6.54E-04	1.54E-03	3.50E-03	7.40E-03	1.18E-02	1.06E-02	9.50E-03	8.94E-03	8.03E-03	7.11E-03	7.93E-03	8.63E-03	8.94E-03	1.03E-02	1.16E-02	1.03E-02	7.75E-03	5.84E-03	5.29E-03	4.42E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0026***	***0.0068***	***0.0130***	***0.0116***	***0.0103***	***0.0096***	***0.0095***	***0.0084***	***0.0094***	***0.0103***	***0.0106***	***0.0123***	***0.0140***	***0.0125***	***0.0092***	***0.0067***	***0.0060***	***0.0051***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.47E-03	1.16E-03	7.84E-04	6.02E-04	5.17E-04	7.96E-04	1.73E-03	4.54E-03	8.64E-03	7.71E-03	6.89E-03	6.40E-03	6.37E-03	5.60E-03	6.29E-03	6.85E-03	7.05E-03	8.22E-03	9.36E-03	8.33E-03	6.11E-03	4.46E-03	4.00E-03	3.39E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.35E-04	5.78E-04	3.92E-04	3.01E-04	2.59E-04	3.98E-04	8.67E-04	2.27E-03	4.32E-03	3.85E-03	3.44E-03	3.20E-03	3.18E-03	2.80E-03	3.15E-03	3.42E-03	3.52E-03	4.11E-03	4.68E-03	4.17E-03	3.05E-03	2.23E-03	2.00E-03	1.69E-03
	Emission in each Box of 1st jet	g/s	2.10E-04	1.65E-04	1.12E-04	8.61E-05	7.39E-05	1.14E-04	2.48E-04	6.48E-04	1.23E-03	1.10E-03	9.84E-04	9.14E-04	9.09E-04	8.01E-04	8.99E-04	9.79E-04	1.01E-03	1.17E-03	1.34E-03	1.19E-03	8.72E-04	6.37E-04	5.72E-04	4.84E-04
	Emission in each Box of 2nd jet	g/s	3.68E-04	2.89E-04	1.96E-04	1.51E-04	1.29E-04	1.99E-04	4.33E-04	1.13E-03	2.16E-03	1.93E-03	1.72E-03	1.60E-03	1.59E-03	1.40E-03	1.57E-03	1.71E-03	1.76E-03	2.05E-03	2.34E-03	2.08E-03	1.53E-03	1.11E-03	1.00E-03	8.47E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085A01-085A09
Enclosure Involvec	085P1
Road Located	085
Vehicle EF Adopte	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	873	708	487	362	304	374	799	1952	2901	2812	2587	2476	2344	2189	2324	2441	2546	2742	2898	2783	2284	1871	1749	1543
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2337	0.1953	0.1968	0.2062	0.2158	0.4105	0.4344	0.3762	0.4049	0.3738	0.3626	0.3573	0.3382	0.3206	0.3381	0.3494	0.3466	0.3713	0.3985	0.3636	0.3345	0.3068	0.3012	0.2851
	NO2	g/vehicle/km	0.0420	0.0403	0.0398	0.0409	0.0423	0.0528	0.0536	0.0574	0.0735	0.0676	0.0656	0.0638	0.0669	0.0630	0.0669	0.0692	0.0681	0.0736	0.0800	0.0733	0.0656	0.0584	0.0567	0.0544
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01	227.01
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0129***	***0.0087***	***0.0060***	***0.0047***	***0.0041***	***0.0097***	***0.0219***	***0.0463***	***0.0741***	***0.0663***	***0.0592***	***0.0558***	***0.0500***	***0.0443***	***0.0495***	***0.0538***	***0.0557***	***0.0642***	***0.0728***	***0.0638***	***0.0482***	***0.0362***	***0.0332***	***0.0277***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.58E-03	5.81E-03	4.03E-03	3.14E-03	2.76E-03	6.45E-03	1.46E-02	3.09E-02	4.94E-02	4.42E-02	3.94E-02	3.72E-02	3.33E-02	2.95E-02	3.30E-02	3.59E-02	3.71E-02	4.28E-02	4.86E-02	4.25E-02	3.21E-02	2.41E-02	2.21E-02	1.85E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.29E-03	2.91E-03	2.01E-03	1.57E-03	1.38E-03	3.23E-03	7.30E-03	1.54E-02	2.47E-02	2.21E-02	1.97E-02	1.86E-02	1.67E-02	1.48E-02	1.65E-02	1.79E-02	1.86E-02	2.14E-02	2.43E-02	2.13E-02	1.61E-02	1.21E-02	1.11E-02	9.25E-03
	Emission in each Box of 1st jet	g/s	1.23E-03	8.30E-04	5.76E-04	4.48E-04	3.94E-04	9.22E-04	2.08E-03	4.41E-03	7.05E-03	6.31E-03	5.63E-03	5.31E-03	4.76E-03	4.22E-03	4.72E-03	5.12E-03	5.30E-03	6.11E-03	6.94E-03	6.08E-03	4.59E-03	3.45E-03	3.16E-03	2.64E-03
	Emission in each Box of 2nd jet	g/s	2.14E-03	1.45E-03	1.01E-03	7.84E-04	6.89E-04	1.61E-03	3.65E-03	7.72E-03	1.23E-02	1.10E-02	9.86E-03	9.30E-03	8.33E-03	7.38E-03	8.26E-03	8.96E-03	9.28E-03	1.07E-02	1.21E-02	1.06E-02	8.03E-03	6.03E-03	5.54E-03	4.62E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0027***	***0.0071***	***0.0134***	***0.0120***	***0.0107***	***0.0100***	***0.0099***	***0.0087***	***0.0098***	***0.0106***	***0.0109***	***0.0127***	***0.0146***	***0.0129***	***0.0095***	***0.0069***	***0.0063***	***0.0053***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-03	1.20E-03	8.15E-04	6.23E-04	5.40E-04	8.30E-04	1.80E-03	4.71E-03	8.97E-03	7.99E-03	7.13E-03	6.64E-03	6.59E-03	5.80E-03	6.53E-03	7.10E-03	7.29E-03	8.48E-03	9.75E-03	8.58E-03	6.30E-03	4.59E-03	4.17E-03	3.53E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.71E-04	6.00E-04	4.07E-04	3.11E-04	2.70E-04	4.15E-04	9.01E-04	2.36E-03	4.48E-03	4.00E-03	3.56E-03	3.32E-03	3.29E-03	2.90E-03	3.27E-03	3.55E-03	3.64E-03	4.24E-03	4.88E-03	4.29E-03	3.15E-03	2.30E-03	2.09E-03	1.77E-03
	Emission in each Box of 1st jet	g/s	2.20E-04	1.71E-04	1.16E-04	8.90E-05	7.72E-05	1.19E-04	2.57E-04	6.73E-04	1.28E-03	1.14E-03	1.02E-03	9.49E-04	9.41E-04	8.29E-04	9.33E-04	1.01E-03	1.04E-03	1.21E-03	1.39E-03	1.23E-03	9.00E-04	6.56E-04	5.96E-04	5.04E-04
	Emission in each Box of 2nd jet	g/s	3.86E-04	3.00E-04	2.04E-04	1.56E-04	1.35E-04	2.07E-04	4.50E-04	1.18E-03	2.24E-03	2.00E-03	1.78E-03	1.66E-03	1.65E-03	1.45E-03	1.63E-03	1.77E-03	1.82E-03	2.12E-03	2.44E-03	2.15E-03	1.58E-03	1.15E-03	1.04E-03	8.83E-04
RSP Emission Rate		g/s	***7.46E-04***	***4.86E-04***	***3.37E-04***	***2.65E-04***	***2.32E-04***	***5.92E-04***	***1.35E-03***	***2.59E-03***	***3.63E-03***	***3.32E-03***	***3.05E-03***	***2.89E-03***	***2.54E-03***	***2.34E-03***	***2.51E-03***	***2.71E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.10E-03***	***2.44E-03***	***1.96E-03***	***1.80E-03***	***1.51E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.98E-04	3.24E-04	2.25E-04	1.77E-04	1.55E-04	3.95E-04	8.97E-04	1.73E-03	2.42E-03	2.21E-03	2.03E-03	1.93E-03	1.69E-03	1.56E-03	1.67E-03	1.81E-03	1.86E-03	2.10E-03	2.31E-03	2.07E-03	1.62E-03	1.31E-03	1.20E-03	1.01E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.49E-04	1.62E-04	1.12E-04	8.85E-05	7.75E-05	1.97E-04	4.49E-04	8.63E-04	1.21E-03	1.11E-03	1.02E-03	9.65E-04	8.46E-04	7.81E-04	8.36E-04	9.04E-04	9.31E-04	1.05E-03	1.15E-03	1.03E-03	8.12E-04	6.55E-04	6.01E-04	5.04E-04
	Emission in each Box of 1st jet	g/s	7.11E-05	4.63E-05	3.21E-05	2.53E-05	2.21E-05	5.64E-05	1.28E-04	2.47E-04	3.45E-04	3.16E-04	2.90E-04	2.76E-04	2.42E-04	2.23E-04	2.39E-04	2.58E-04	2.66E-04	3.00E-04	3.30E-04	2.95E-04	2.32E-04	1.87E-04	1.72E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.24E-04	8.10E-05	5.62E-05	4.42E-05	3.87E-05	9.87E-05	2.24E-04	4.32E-04	6.04E-04	5.54E-04	5.08E-04	4.82E-04	4.23E-04	3.90E-04	4.18E-04	4.52E-04	4.66E-04	5.26E-04	5.77E-04	5.17E-04	4.06E-04	3.27E-04	3.01E-04	2.52E-04
FSP Emission Rate		g/s	***6.86E-04***	***4.47E-04***	***3.10E-04***	***2.44E-04***	***2.14E-04***	***5.45E-04***	***1.24E-03***	***2.39E-03***	***3.34E-03***	***3.05E-03***	***2.80E-03***	***2.66E-03***	***2.34E-03***	***2.15E-03***	***2.31E-03***	***2.49E-03***	***2.57E-03***	***2.89E-03***	***3.19E-03***	***2.84E-03***	***2.24E-03***	***1.81E-03***	***1.66E-03***	***1.39E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.58E-04	2.98E-04	2.07E-04	1.63E-04	1.42E-04	3.63E-04	8.25E-04	1.59E-03	2.23E-03	2.03E-03	1.87E-03	1.77E-03	1.56E-03	1.44E-03	1.54E-03	1.66E-03	1.71E-03	1.93E-03	2.13E-03	1.90E-03	1.49E-03	1.21E-03	1.11E-03	9.29E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.29E-04	1.49E-04	1.03E-04	8.13E-05	7.12E-05	1.82E-04	4.12E-04	7.96E-04	1.11E-03	1.02E-03	9.35E-04	8.87E-04	7.79E-04	7.18E-04	7.69E-04	8.31E-04	8.56E-04	9.64E-04	1.06E-03	9.48E-04	7.47E-04	6.03E-04	5.54E-04	4.65E-04
	Emission in each Box of 1st jet	g/s	6.54E-05	4.26E-05	2.95E-05	2.32E-05	2.03E-05	5.19E-05	1.18E-04	2.27E-04	3.18E-04	2.90E-04	2.67E-04	2.53E-04	2.22E-04	2.05E-04	2.20E-04	2.37E-04	2.45E-04	2.76E-04	3.04E-04	2.71E-04	2.13E-04	1.72E-04	1.58E-04	1.33E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	7.45E-05	5.17E-05	4.07E-05	3.56E-05	9.08E-05	2.06E-04	3.98E-04	5.57E-04	5.08E-04	4.67E-04	4.44E-04	3.89E-04	3.59E-04	3.84E-04	4.15E-04	4.28E-04	4.82E-04	5.31E-04	4.74E-04	3.74E-04	3.02E-04	2.77E-04	2.32E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2459	0.2064	0.2086	0.2186	0.2264	0.4297	0.4578	0.3935	0.4255	0.3933	0.3853	0.3765	0.3601	0.3399	0.3545	0.3706	0.3680	0.3919	0.4181	0.3817	0.3515	0.3227	0.3165	0.2990
	NO2	g/vehicle/km	0.0439	0.0423	0.0418	0.0430	0.0440	0.0550	0.0562	0.0598	0.0769	0.0708	0.0693	0.0670	0.0709	0.0665	0.0699	0.0730	0.0720	0.0774	0.0836	0.0766	0.0687	0.0611	0.0593	0.0568
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0064***	***0.0044***	***0.0030***	***0.0024***	***0.0021***	***0.0046***	***0.0105***	***0.0227***	***0.0368***	***0.0330***	***0.0296***	***0.0277***	***0.0334***	***0.0295***	***0.0326***	***0.0358***	***0.0372***	***0.0427***	***0.0481***	***0.0422***	***0.0318***	***0.0239***	***0.0220***	***0.0183***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.26E-03	2.92E-03	2.03E-03	1.58E-03	1.38E-03	3.08E-03	6.97E-03	1.51E-02	2.45E-02	2.20E-02	1.97E-02	1.85E-02	2.23E-02	1.97E-02	2.17E-02	2.39E-02	2.48E-02	2.85E-02	3.21E-02	2.82E-02	2.12E-02	1.59E-02	1.46E-02	1.22E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.13E-03	1.46E-03	1.01E-03	7.88E-04	6.90E-04	1.54E-03	3.49E-03	7.55E-03	1.23E-02	1.10E-02	9.87E-03	9.23E-03	1.11E-02	9.83E-03	1.09E-02	1.19E-02	1.24E-02	1.42E-02	1.60E-02	1.41E-02	1.06E-02	7.97E-03	7.32E-03	6.11E-03
	Emission in each Box of 1st jet	g/s	2.66E-04	1.83E-04	1.27E-04	9.85E-05	8.63E-05	1.92E-04	4.36E-04	9.44E-04	1.53E-03	1.37E-03	1.23E-03	1.15E-03	1.39E-03	1.23E-03	1.36E-03	1.49E-03	1.55E-03	1.78E-03	2.01E-03	1.76E-03	1.33E-03	9.96E-04	9.15E-04	7.64E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	9.74E-05	6.76E-05	5.25E-05	4.60E-05	1.03E-04	2.32E-04	5.03E-04	8.17E-04	7.33E-04	6.58E-04	6.15E-04	7.42E-04	6.55E-04	7.24E-04	7.96E-04	8.26E-04	9.49E-04	1.07E-03	9.39E-04	7.07E-04	5.31E-04	4.88E-04	4.08E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0034***	***0.0066***	***0.0059***	***0.0053***	***0.0049***	***0.0066***	***0.0058***	***0.0064***	***0.0071***	***0.0073***	***0.0084***	***0.0096***	***0.0085***	***0.0062***	***0.0045***	***0.0041***	***0.0035***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.61E-04	5.99E-04	4.07E-04	3.10E-04	2.69E-04	3.94E-04	8.56E-04	2.29E-03	4.43E-03	3.96E-03	3.55E-03	3.28E-03	4.38E-03	3.85E-03	4.28E-03	4.71E-03	4.85E-03	5.62E-03	6.42E-03	5.65E-03	4.15E-03	3.02E-03	2.74E-03	2.32E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.80E-04	2.99E-04	2.03E-04	1.55E-04	1.34E-04	1.97E-04	4.28E-04	1.15E-03	2.21E-03	1.98E-03	1.77E-03	1.64E-03	2.19E-03	1.92E-03	2.14E-03	2.35E-03	2.43E-03	2.81E-03	3.21E-03	2.83E-03	2.07E-03	1.51E-03	1.37E-03	1.16E-03
	Emission in each Box of 1st jet	g/s	4.76E-05	3.74E-05	2.54E-05	1.94E-05	1.68E-05	2.46E-05	5.35E-05	1.43E-04	2.77E-04	2.48E-04	2.22E-04	2.05E-04	2.74E-04	2.40E-04	2.68E-04	2.94E-04	3.03E-04	3.51E-04	4.01E-04	3.53E-04	2.59E-04	1.89E-04	1.71E-04	1.45E-04
	Emission in each Box of 2nd jet	g/s	2.54E-05	2.00E-05	1.36E-05	1.03E-05	8.95E-06	1.31E-05	2.85E-05	7.65E-05	1.48E-04	1.32E-04	1.18E-04	1.09E-04	1.46E-04	1.28E-04	1.43E-04	1.57E-04	1.62E-04	1.87E-04	2.14E-04	1.88E-04	1.38E-04	1.01E-04	9.14E-05	7.75E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2300	0.1912	0.1927	0.2042	0.2112	0.4021	0.4246	0.3685	0.3949	0.3605	0.3556	0.3474	0.3324	0.3161	0.3323	0.3444	0.3416	0.3658	0.3899	0.3583	0.3297	0.3032	0.2940	0.2776
	NO2	g/vehicle/km	0.0414	0.0396	0.0391	0.0405	0.0414	0.0517	0.0524	0.0562	0.0718	0.0654	0.0643	0.0621	0.0658	0.0622	0.0658	0.0682	0.0672	0.0726	0.0784	0.0724	0.0647	0.0578	0.0555	0.0531
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0060***	***0.0041***	***0.0028***	***0.0022***	***0.0019***	***0.0043***	***0.0097***	***0.0212***	***0.0341***	***0.0302***	***0.0273***	***0.0256***	***0.0308***	***0.0274***	***0.0305***	***0.0333***	***0.0345***	***0.0398***	***0.0449***	***0.0397***	***0.0299***	***0.0225***	***0.0204***	***0.0170***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.98E-03	2.71E-03	1.87E-03	1.47E-03	1.29E-03	2.88E-03	6.46E-03	1.41E-02	2.27E-02	2.02E-02	1.82E-02	1.70E-02	2.05E-02	1.83E-02	2.04E-02	2.22E-02	2.30E-02	2.66E-02	2.99E-02	2.64E-02	1.99E-02	1.50E-02	1.36E-02	1.14E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.99E-03	1.35E-03	9.37E-04	7.36E-04	6.44E-04	1.44E-03	3.23E-03	7.07E-03	1.14E-02	1.01E-02	9.11E-03	8.52E-03	1.03E-02	9.14E-03	1.02E-02	1.11E-02	1.15E-02	1.33E-02	1.50E-02	1.32E-02	9.96E-03	7.49E-03	6.80E-03	5.68E-03
	Emission in each Box of 1st jet	g/s	2.49E-04	1.69E-04	1.17E-04	9.20E-05	8.05E-05	1.80E-04	4.04E-04	8.84E-04	1.42E-03	1.26E-03	1.14E-03	1.06E-03	1.28E-03	1.14E-03	1.27E-03	1.39E-03	1.44E-03	1.66E-03	1.87E-03	1.65E-03	1.24E-03	9.36E-04	8.50E-04	7.10E-04
	Emission in each Box of 2nd jet	g/s	1.33E-04	9.02E-05	6.24E-05	4.91E-05	4.29E-05	9.60E-05	2.15E-04	4.71E-04	7.58E-04	6.72E-04	6.07E-04	5.68E-04	6.85E-04	6.09E-04	6.79E-04	7.40E-04	7.67E-04	8.86E-04	9.98E-04	8.81E-04	6.64E-04	4.99E-04	4.53E-04	3.78E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0032***	***0.0062***	***0.0055***	***0.0049***	***0.0046***	***0.0061***	***0.0054***	***0.0060***	***0.0066***	***0.0068***	***0.0079***	***0.0090***	***0.0080***	***0.0059***	***0.0043***	***0.0039***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.17E-04	5.60E-04	3.80E-04	2.92E-04	2.53E-04	3.71E-04	7.98E-04	2.16E-03	4.14E-03	3.66E-03	3.29E-03	3.05E-03	4.06E-03	3.60E-03	4.03E-03	4.40E-03	4.53E-03	5.27E-03	6.02E-03	5.34E-03	3.91E-03	2.85E-03	2.57E-03	2.17E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.58E-04	2.80E-04	1.90E-04	1.46E-04	1.26E-04	1.85E-04	3.99E-04	1.08E-03	2.07E-03	1.83E-03	1.65E-03	1.52E-03	2.03E-03	1.80E-03	2.02E-03	2.20E-03	2.26E-03	2.64E-03	3.01E-03	2.67E-03	1.95E-03	1.43E-03	1.28E-03	1.09E-03
	Emission in each Box of 1st jet	g/s	4.48E-05	3.50E-05	2.37E-05	1.83E-05	1.58E-05	2.32E-05	4.99E-05	1.35E-04	2.59E-04	2.29E-04	2.06E-04	1.90E-04	2.54E-04	2.25E-04	2.52E-04	2.75E-04	2.83E-04	3.29E-04	3.76E-04	3.34E-04	2.44E-04	1.78E-04	1.61E-04	1.36E-04
	Emission in each Box of 2nd jet	g/s	2.39E-05	1.87E-05	1.27E-05	9.73E-06	8.42E-06	1.24E-05	2.66E-05	7.20E-05	1.38E-04	1.22E-04	1.10E-04	1.02E-04	1.35E-04	1.20E-04	1.34E-04	1.47E-04	1.51E-04	1.76E-04	2.01E-04	1.78E-04	1.30E-04	9.51E-05	8.56E-05	7.24E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2171	0.1806	0.1824	0.1905	0.1970	0.3769	0.3990	0.3469	0.3727	0.3434	0.3348	0.3315	0.3173	0.2972	0.3125	0.3277	0.3216	0.3462	0.3716	0.3387	0.3104	0.2853	0.2765	0.2617
	NO2	g/vehicle/km	0.0393	0.0377	0.0372	0.0382	0.0390	0.0487	0.0495	0.0532	0.0681	0.0625	0.0608	0.0595	0.0629	0.0587	0.0620	0.0650	0.0634	0.0689	0.0750	0.0687	0.0612	0.0546	0.0524	0.0503
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0056***	***0.0038***	***0.0027***	***0.0021***	***0.0018***	***0.0041***	***0.0091***	***0.0200***	***0.0322***	***0.0288***	***0.0257***	***0.0244***	***0.0294***	***0.0258***	***0.0287***	***0.0317***	***0.0325***	***0.0377***	***0.0428***	***0.0375***	***0.0281***	***0.0211***	***0.0192***	***0.0161***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.76E-03	2.56E-03	1.77E-03	1.37E-03	1.20E-03	2.70E-03	6.08E-03	1.33E-02	2.15E-02	1.92E-02	1.71E-02	1.63E-02	1.96E-02	1.72E-02	1.91E-02	2.11E-02	2.17E-02	2.51E-02	2.85E-02	2.50E-02	1.87E-02	1.41E-02	1.28E-02	1.07E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.88E-03	1.28E-03	8.87E-04	6.86E-04	6.01E-04	1.35E-03	3.04E-03	6.66E-03	1.07E-02	9.60E-03	8.57E-03	8.13E-03	9.80E-03	8.59E-03	9.57E-03	1.06E-02	1.08E-02	1.26E-02	1.43E-02	1.25E-02	9.37E-03	7.04E-03	6.40E-03	5.35E-03
	Emission in each Box of 1st jet	g/s	2.35E-04	1.60E-04	1.11E-04	8.58E-05	7.51E-05	1.69E-04	3.80E-04	8.32E-04	1.34E-03	1.20E-03	1.07E-03	1.02E-03	1.23E-03	1.07E-03	1.20E-03	1.32E-03	1.35E-03	1.57E-03	1.78E-03	1.56E-03	1.17E-03	8.80E-04	8.00E-04	6.69E-04
	Emission in each Box of 2nd jet	g/s	1.25E-04	8.52E-05	5.91E-05	4.58E-05	4.00E-05	9.00E-05	2.03E-04	4.44E-04	7.16E-04	6.40E-04	5.72E-04	5.42E-04	6.54E-04	5.73E-04	6.38E-04	7.04E-04	7.22E-04	8.38E-04	9.51E-04	8.33E-04	6.25E-04	4.70E-04	4.26E-04	3.57E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0031***	***0.0059***	***0.0052***	***0.0047***	***0.0044***	***0.0058***	***0.0051***	***0.0057***	***0.0063***	***0.0064***	***0.0075***	***0.0086***	***0.0076***	***0.0055***	***0.0040***	***0.0036***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.81E-04	5.33E-04	3.62E-04	2.75E-04	2.38E-04	3.49E-04	7.54E-04	2.04E-03	3.92E-03	3.49E-03	3.11E-03	2.92E-03	3.89E-03	3.39E-03	3.80E-03	4.19E-03	4.28E-03	5.01E-03	5.75E-03	5.07E-03	3.70E-03	2.70E-03	2.43E-03	2.06E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.40E-04	2.67E-04	1.81E-04	1.38E-04	1.19E-04	1.75E-04	3.77E-04	1.02E-03	1.96E-03	1.75E-03	1.56E-03	1.46E-03	1.94E-03	1.70E-03	1.90E-03	2.10E-03	2.14E-03	2.50E-03	2.88E-03	2.53E-03	1.85E-03	1.35E-03	1.21E-03	1.03E-03
	Emission in each Box of 1st jet	g/s	4.25E-05	3.33E-05	2.26E-05	1.72E-05	1.49E-05	2.18E-05	4.71E-05	1.28E-04	2.45E-04	2.18E-04	1.95E-04	1.82E-04	2.43E-04	2.12E-04	2.38E-04	2.62E-04	2.67E-04	3.13E-04	3.60E-04	3.17E-04	2.31E-04	1.69E-04	1.52E-04	1.29E-04
	Emission in each Box of 2nd jet	g/s	2.27E-05	1.78E-05	1.21E-05	9.17E-06	7.93E-06	1.16E-05	2.51E-05	6.81E-05	1.31E-04	1.16E-04	1.04E-04	9.72E-05	1.30E-04	1.13E-04	1.27E-04	1.40E-04	1.43E-04	1.67E-04	1.92E-04	1.69E-04	1.23E-04	8.99E-05	8.09E-05	6.86E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2040	0.1694	0.1704	0.1822	0.1885	0.3627	0.3840	0.3307	0.3552	0.3274	0.3189	0.3152	0.3018	0.2873	0.3021	0.3114	0.3119	0.3297	0.3541	0.3211	0.2947	0.2752	0.2657	0.2505
	NO2	g/vehicle/km	0.0372	0.0356	0.0351	0.0367	0.0375	0.0470	0.0478	0.0509	0.0650	0.0597	0.0580	0.0566	0.0600	0.0568	0.0601	0.0620	0.0616	0.0657	0.0716	0.0653	0.0584	0.0528	0.0505	0.0483
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0053***	***0.0036***	***0.0025***	***0.0020***	***0.0017***	***0.0039***	***0.0088***	***0.0190***	***0.0307***	***0.0275***	***0.0245***	***0.0232***	***0.0280***	***0.0249***	***0.0278***	***0.0301***	***0.0315***	***0.0359***	***0.0408***	***0.0355***	***0.0267***	***0.0204***	***0.0184***	***0.0154***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.53E-03	2.40E-03	1.66E-03	1.31E-03	1.15E-03	2.60E-03	5.85E-03	1.27E-02	2.05E-02	1.83E-02	1.63E-02	1.55E-02	1.86E-02	1.66E-02	1.85E-02	2.01E-02	2.10E-02	2.39E-02	2.72E-02	2.37E-02	1.78E-02	1.36E-02	1.23E-02	1.02E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.77E-03	1.20E-03	8.28E-04	6.57E-04	5.75E-04	1.30E-03	2.92E-03	6.35E-03	1.02E-02	9.15E-03	8.17E-03	7.73E-03	9.32E-03	8.31E-03	9.26E-03	1.00E-02	1.05E-02	1.20E-02	1.36E-02	1.18E-02	8.90E-03	6.80E-03	6.15E-03	5.12E-03
	Emission in each Box of 1st jet	g/s	2.21E-04	1.50E-04	1.04E-04	8.21E-05	7.18E-05	1.62E-04	3.65E-04	7.93E-04	1.28E-03	1.14E-03	1.02E-03	9.66E-04	1.17E-03	1.04E-03	1.16E-03	1.25E-03	1.31E-03	1.50E-03	1.70E-03	1.48E-03	1.11E-03	8.50E-04	7.68E-04	6.40E-04
	Emission in each Box of 2nd jet	g/s	1.18E-04	8.00E-05	5.52E-05	4.38E-05	3.83E-05	8.66E-05	1.95E-04	4.23E-04	6.82E-04	6.10E-04	5.44E-04	5.15E-04	6.22E-04	5.54E-04	6.17E-04	6.69E-04	7.01E-04	7.98E-04	9.06E-04	7.90E-04	5.93E-04	4.53E-04	4.10E-04	3.41E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0029***	***0.0056***	***0.0050***	***0.0045***	***0.0042***	***0.0056***	***0.0049***	***0.0055***	***0.0060***	***0.0062***	***0.0072***	***0.0082***	***0.0072***	***0.0053***	***0.0039***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.43E-04	5.04E-04	3.41E-04	2.65E-04	2.29E-04	3.37E-04	7.28E-04	1.95E-03	3.75E-03	3.34E-03	2.97E-03	2.78E-03	3.71E-03	3.28E-03	3.68E-03	4.00E-03	4.15E-03	4.77E-03	5.49E-03	4.81E-03	3.52E-03	2.61E-03	2.34E-03	1.97E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.22E-04	2.52E-04	1.70E-04	1.32E-04	1.14E-04	1.69E-04	3.64E-04	9.76E-04	1.87E-03	1.67E-03	1.49E-03	1.39E-03	1.85E-03	1.64E-03	1.84E-03	2.00E-03	2.08E-03	2.39E-03	2.75E-03	2.41E-03	1.76E-03	1.30E-03	1.17E-03	9.87E-04
	Emission in each Box of 1st jet	g/s	4.02E-05	3.15E-05	2.13E-05	1.65E-05	1.43E-05	2.11E-05	4.55E-05	1.22E-04	2.34E-04	2.09E-04	1.86E-04	1.74E-04	2.32E-04	2.05E-04	2.30E-04	2.50E-04	2.60E-04	2.98E-04	3.43E-04	3.01E-04	2.20E-04	1.63E-04	1.46E-04	1.23E-04
	Emission in each Box of 2nd jet	g/s	2.14E-05	1.68E-05	1.14E-05	8.82E-06	7.63E-06	1.12E-05	2.43E-05	6.51E-05	1.25E-04	1.11E-04	9.91E-05	9.26E-05	1.24E-04	1.09E-04	1.23E-04	1.33E-04	1.38E-04	1.59E-04	1.83E-04	1.60E-04	1.17E-04	8.68E-05	7.79E-05	6.58E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1834	0.1512	0.1526	0.1589	0.1644	0.3168	0.3315	0.2876	0.3131	0.2870	0.2843	0.2805	0.2704	0.2562	0.2713	0.2784	0.2780	0.2982	0.3126	0.2885	0.2643	0.2401	0.2335	0.2197
	NO2	g/vehicle/km	0.0336	0.0321	0.0317	0.0324	0.0331	0.0414	0.0415	0.0445	0.0576	0.0526	0.0520	0.0506	0.0540	0.0509	0.0542	0.0556	0.0552	0.0597	0.0635	0.0589	0.0526	0.0464	0.0447	0.0426
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0048***	***0.0032***	***0.0022***	***0.0017***	***0.0015***	***0.0034***	***0.0076***	***0.0166***	***0.0271***	***0.0241***	***0.0218***	***0.0206***	***0.0251***	***0.0222***	***0.0249***	***0.0269***	***0.0281***	***0.0325***	***0.0360***	***0.0319***	***0.0239***	***0.0178***	***0.0162***	***0.0135***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.18E-03	2.14E-03	1.48E-03	1.14E-03	1.00E-03	2.27E-03	5.05E-03	1.10E-02	1.80E-02	1.60E-02	1.46E-02	1.38E-02	1.67E-02	1.48E-02	1.66E-02	1.80E-02	1.87E-02	2.17E-02	2.40E-02	2.13E-02	1.60E-02	1.19E-02	1.08E-02	8.99E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.59E-03	1.07E-03	7.42E-04	5.72E-04	5.01E-04	1.13E-03	2.52E-03	5.52E-03	9.02E-03	8.02E-03	7.28E-03	6.88E-03	8.36E-03	7.41E-03	8.31E-03	8.98E-03	9.37E-03	1.08E-02	1.20E-02	1.06E-02	7.98E-03	5.93E-03	5.40E-03	4.49E-03
	Emission in each Box of 1st jet	g/s	1.98E-04	1.34E-04	9.27E-05	7.16E-05	6.27E-05	1.42E-04	3.15E-04	6.90E-04	1.13E-03	1.00E-03	9.10E-04	8.60E-04	1.04E-03	9.26E-04	1.04E-03	1.12E-03	1.17E-03	1.35E-03	1.50E-03	1.33E-03	9.98E-04	7.41E-04	6.75E-04	5.62E-04
	Emission in each Box of 2nd jet	g/s	1.06E-04	7.14E-05	4.95E-05	3.82E-05	3.34E-05	7.57E-05	1.68E-04	3.68E-04	6.01E-04	5.35E-04	4.85E-04	4.58E-04	5.57E-04	4.94E-04	5.54E-04	5.98E-04	6.24E-04	7.22E-04	8.00E-04	7.09E-04	5.32E-04	3.95E-04	3.60E-04	3.00E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0026***	***0.0050***	***0.0044***	***0.0040***	***0.0037***	***0.0050***	***0.0044***	***0.0050***	***0.0054***	***0.0056***	***0.0065***	***0.0073***	***0.0065***	***0.0048***	***0.0034***	***0.0031***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.82E-04	4.54E-04	3.08E-04	2.33E-04	2.02E-04	2.96E-04	6.32E-04	1.71E-03	3.32E-03	2.94E-03	2.66E-03	2.48E-03	3.33E-03	2.94E-03	3.32E-03	3.59E-03	3.72E-03	4.34E-03	4.87E-03	4.35E-03	3.18E-03	2.29E-03	2.07E-03	1.74E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.91E-04	2.27E-04	1.54E-04	1.17E-04	1.01E-04	1.48E-04	3.16E-04	8.54E-04	1.66E-03	1.47E-03	1.33E-03	1.24E-03	1.67E-03	1.47E-03	1.66E-03	1.79E-03	1.86E-03	2.17E-03	2.44E-03	2.17E-03	1.59E-03	1.14E-03	1.03E-03	8.72E-04
	Emission in each Box of 1st jet	g/s	3.64E-05	2.84E-05	1.93E-05	1.46E-05	1.26E-05	1.85E-05	3.95E-05	1.07E-04	2.07E-04	1.84E-04	1.66E-04	1.55E-04	2.08E-04	1.84E-04	2.07E-04	2.24E-04	2.32E-04	2.71E-04	3.05E-04	2.72E-04	1.98E-04	1.43E-04	1.29E-04	1.09E-04
	Emission in each Box of 2nd jet	g/s	1.94E-05	1.51E-05	1.03E-05	7.78E-06	6.73E-06	9.88E-06	2.11E-05	5.70E-05	1.11E-04	9.81E-05	8.87E-05	8.27E-05	1.11E-04	9.81E-05	1.11E-04	1.20E-04	1.24E-04	1.45E-04	1.62E-04	1.45E-04	1.06E-04	7.63E-05	6.89E-05	5.81E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1771	0.1467	0.1518	0.1580	0.1626	0.3134	0.3238	0.2841	0.3063	0.2865	0.2754	0.2717	0.2603	0.2482	0.2593	0.2698	0.2736	0.2912	0.3069	0.2852	0.2614	0.2387	0.2308	0.2184
	NO2	g/vehicle/km	0.0325	0.0311	0.0315	0.0322	0.0328	0.0409	0.0406	0.0441	0.0565	0.0526	0.0504	0.0491	0.0520	0.0494	0.0519	0.0540	0.0544	0.0584	0.0624	0.0583	0.0520	0.0461	0.0442	0.0424
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0046***	***0.0031***	***0.0022***	***0.0017***	***0.0015***	***0.0034***	***0.0074***	***0.0164***	***0.0265***	***0.0240***	***0.0212***	***0.0200***	***0.0241***	***0.0215***	***0.0238***	***0.0261***	***0.0277***	***0.0317***	***0.0353***	***0.0316***	***0.0237***	***0.0177***	***0.0160***	***0.0134***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.07E-03	2.08E-03	1.48E-03	1.14E-03	9.91E-04	2.25E-03	4.93E-03	1.09E-02	1.76E-02	1.60E-02	1.41E-02	1.33E-02	1.61E-02	1.44E-02	1.59E-02	1.74E-02	1.84E-02	2.11E-02	2.36E-02	2.10E-02	1.58E-02	1.18E-02	1.07E-02	8.93E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.53E-03	1.04E-03	7.38E-04	5.69E-04	4.96E-04	1.12E-03	2.46E-03	5.45E-03	8.82E-03	8.01E-03	7.05E-03	6.66E-03	8.04E-03	7.18E-03	7.95E-03	8.70E-03	9.22E-03	1.06E-02	1.18E-02	1.05E-02	7.89E-03	5.89E-03	5.34E-03	4.47E-03
	Emission in each Box of 1st jet	g/s	1.92E-04	1.30E-04	9.22E-05	7.12E-05	6.20E-05	1.40E-04	3.08E-04	6.81E-04	1.10E-03	1.00E-03	8.82E-04	8.33E-04	1.01E-03	8.97E-04	9.93E-04	1.09E-03	1.15E-03	1.32E-03	1.47E-03	1.32E-03	9.86E-04	7.37E-04	6.67E-04	5.58E-04
	Emission in each Box of 2nd jet	g/s	1.02E-04	6.93E-05	4.92E-05	3.80E-05	3.30E-05	7.48E-05	1.64E-04	3.63E-04	5.88E-04	5.34E-04	4.70E-04	4.44E-04	5.36E-04	4.78E-04	5.30E-04	5.80E-04	6.15E-04	7.05E-04	7.85E-04	7.01E-04	5.26E-04	3.93E-04	3.56E-04	2.98E-04
NO_2 Emission Rate		g/s	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0025***	***0.0049***	***0.0044***	***0.0039***	***0.0036***	***0.0048***	***0.0043***	***0.0048***	***0.0052***	***0.0055***	***0.0064***	***0.0072***	***0.0065***	***0.0047***	***0.0034***	***0.0031***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.62E-04	4.40E-04	3.06E-04	2.32E-04	2.00E-04	2.93E-04	6.19E-04	1.69E-03	3.25E-03	2.94E-03	2.58E-03	2.41E-03	3.22E-03	2.85E-03	3.18E-03	3.48E-03	3.67E-03	4.24E-03	4.79E-03	4.30E-03	3.14E-03	2.28E-03	2.04E-03	1.73E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.81E-04	2.20E-04	1.53E-04	1.16E-04	9.99E-05	1.47E-04	3.09E-04	8.45E-04	1.63E-03	1.47E-03	1.29E-03	1.20E-03	1.61E-03	1.43E-03	1.59E-03	1.74E-03	1.83E-03	2.12E-03	2.40E-03	2.15E-03	1.57E-03	1.14E-03	1.02E-03	8.67E-04
	Emission in each Box of 1st jet	g/s	3.52E-05	2.75E-05	1.91E-05	1.45E-05	1.25E-05	1.83E-05	3.87E-05	1.06E-04	2.03E-04	1.84E-04	1.61E-04	1.50E-04	2.01E-04	1.78E-04	1.99E-04	2.18E-04	2.29E-04	2.65E-04	2.99E-04	2.69E-04	1.96E-04	1.42E-04	1.28E-04	1.08E-04
	Emission in each Box of 2nd jet	g/s	1.87E-05	1.47E-05	1.02E-05	7.74E-06	6.66E-06	9.78E-06	2.06E-05	5.64E-05	1.08E-04	9.80E-05	8.61E-05	8.03E-05	1.07E-04	9.51E-05	1.06E-04	1.16E-04	1.22E-04	1.41E-04	1.60E-04	1.43E-04	1.05E-04	7.59E-05	6.82E-05	5.78E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1782	0.1459	0.1472	0.1530	0.1584	0.3038	0.3238	0.2771	0.2990	0.2771	0.2765	0.2747	0.2555	0.2439	0.2622	0.2709	0.2687	0.2902	0.3036	0.2820	0.2568	0.2358	0.2279	0.2130
	NO2	g/vehicle/km	0.0327	0.0309	0.0306	0.0313	0.0320	0.0398	0.0406	0.0430	0.0552	0.0509	0.0507	0.0497	0.0511	0.0485	0.0525	0.0542	0.0534	0.0582	0.0618	0.0577	0.0511	0.0456	0.0437	0.0414
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0046***	***0.0031***	***0.0021***	***0.0017***	***0.0014***	***0.0033***	***0.0074***	***0.0160***	***0.0258***	***0.0232***	***0.0212***	***0.0202***	***0.0237***	***0.0212***	***0.0241***	***0.0262***	***0.0272***	***0.0316***	***0.0350***	***0.0312***	***0.0233***	***0.0175***	***0.0158***	***0.0131***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.08E-03	2.07E-03	1.43E-03	1.10E-03	9.66E-04	2.18E-03	4.93E-03	1.06E-02	1.72E-02	1.55E-02	1.42E-02	1.35E-02	1.58E-02	1.41E-02	1.61E-02	1.75E-02	1.81E-02	2.11E-02	2.33E-02	2.08E-02	1.55E-02	1.16E-02	1.05E-02	8.71E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.54E-03	1.03E-03	7.15E-04	5.51E-04	4.83E-04	1.09E-03	2.46E-03	5.32E-03	8.61E-03	7.75E-03	7.08E-03	6.74E-03	7.89E-03	7.05E-03	8.03E-03	8.73E-03	9.05E-03	1.05E-02	1.17E-02	1.04E-02	7.75E-03	5.82E-03	5.27E-03	4.36E-03
	Emission in each Box of 1st jet	g/s	1.93E-04	1.29E-04	8.94E-05	6.89E-05	6.04E-05	1.36E-04	3.08E-04	6.65E-04	1.08E-03	9.68E-04	8.85E-04	8.42E-04	9.87E-04	8.82E-04	1.00E-03	1.09E-03	1.13E-03	1.32E-03	1.46E-03	1.30E-03	9.69E-04	7.28E-04	6.59E-04	5.44E-04
	Emission in each Box of 2nd jet	g/s	1.03E-04	6.88E-05	4.77E-05	3.68E-05	3.22E-05	7.25E-05	1.64E-04	3.54E-04	5.74E-04	5.16E-04	4.72E-04	4.49E-04	5.26E-04	4.70E-04	5.36E-04	5.82E-04	6.04E-04	7.02E-04	7.77E-04	6.94E-04	5.17E-04	3.88E-04	3.51E-04	2.90E-04
NO_2 Emission Rate		g/s	***0.0008***	***0.0007***	***0.0004***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0025***	***0.0048***	***0.0043***	***0.0039***	***0.0037***	***0.0047***	***0.0042***	***0.0048***	***0.0052***	***0.0054***	***0.0063***	***0.0071***	***0.0064***	***0.0046***	***0.0034***	***0.0030***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.66E-04	4.38E-04	2.98E-04	2.26E-04	1.95E-04	2.85E-04	6.19E-04	1.65E-03	3.18E-03	2.85E-03	2.59E-03	2.44E-03	3.16E-03	2.81E-03	3.21E-03	3.50E-03	3.60E-03	4.22E-03	4.74E-03	4.25E-03	3.09E-03	2.25E-03	2.02E-03	1.69E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.83E-04	2.19E-04	1.49E-04	1.13E-04	9.76E-05	1.42E-04	3.09E-04	8.25E-04	1.59E-03	1.42E-03	1.30E-03	1.22E-03	1.58E-03	1.40E-03	1.61E-03	1.75E-03	1.80E-03	2.11E-03	2.37E-03	2.13E-03	1.54E-03	1.13E-03	1.01E-03	8.47E-04
	Emission in each Box of 1st jet	g/s	3.54E-05	2.74E-05	1.86E-05	1.41E-05	1.22E-05	1.78E-05	3.87E-05	1.03E-04	1.99E-04	1.78E-04	1.62E-04	1.52E-04	1.97E-04	1.75E-04	2.01E-04	2.18E-04	2.25E-04	2.64E-04	2.96E-04	2.66E-04	1.93E-04	1.41E-04	1.26E-04	1.06E-04
	Emission in each Box of 2nd jet	g/s	1.89E-05	1.46E-05	9.92E-06	7.52E-06	6.50E-06	9.49E-06	2.06E-05	5.50E-05	1.06E-04	9.49E-05	8.65E-05	8.12E-05	1.05E-04	9.35E-05	1.07E-04	1.17E-04	1.20E-04	1.41E-04	1.58E-04	1.42E-04	1.03E-04	7.50E-05	6.73E-05	5.64E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1805	0.1488	0.1501	0.1562	0.1616	0.3100	0.3303	0.2841	0.3026	0.2781	0.2809	0.2752	0.2603	0.2482	0.2610	0.2698	0.2753	0.2894	0.3122	0.2820	0.2569	0.2359	0.2281	0.2159
	NO2	g/vehicle/km	0.0331	0.0315	0.0312	0.0319	0.0326	0.0405	0.0414	0.0441	0.0558	0.0511	0.0514	0.0498	0.0520	0.0494	0.0522	0.0540	0.0547	0.0581	0.0635	0.0577	0.0512	0.0456	0.0437	0.0419
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0047***	***0.0032***	***0.0022***	***0.0017***	***0.0015***	***0.0033***	***0.0075***	***0.0164***	***0.0261***	***0.0233***	***0.0216***	***0.0202***	***0.0241***	***0.0215***	***0.0240***	***0.0261***	***0.0278***	***0.0315***	***0.0360***	***0.0312***	***0.0233***	***0.0175***	***0.0158***	***0.0132***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.12E-03	2.11E-03	1.46E-03	1.13E-03	9.86E-04	2.22E-03	5.03E-03	1.09E-02	1.74E-02	1.55E-02	1.44E-02	1.35E-02	1.61E-02	1.44E-02	1.60E-02	1.74E-02	1.85E-02	2.10E-02	2.40E-02	2.08E-02	1.55E-02	1.16E-02	1.06E-02	8.83E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.56E-03	1.05E-03	7.30E-04	5.63E-04	4.93E-04	1.11E-03	2.51E-03	5.45E-03	8.72E-03	7.77E-03	7.19E-03	6.75E-03	8.04E-03	7.18E-03	8.00E-03	8.70E-03	9.27E-03	1.05E-02	1.20E-02	1.04E-02	7.76E-03	5.82E-03	5.28E-03	4.41E-03
	Emission in each Box of 1st jet	g/s	1.95E-04	1.32E-04	9.12E-05	7.03E-05	6.16E-05	1.39E-04	3.14E-04	6.81E-04	1.09E-03	9.72E-04	8.99E-04	8.44E-04	1.01E-03	8.97E-04	1.00E-03	1.09E-03	1.16E-03	1.31E-03	1.50E-03	1.30E-03	9.70E-04	7.28E-04	6.60E-04	5.52E-04
	Emission in each Box of 2nd jet	g/s	1.04E-04	7.02E-05	4.86E-05	3.75E-05	3.29E-05	7.40E-05	1.68E-04	3.63E-04	5.81E-04	5.18E-04	4.80E-04	4.50E-04	5.36E-04	4.78E-04	5.33E-04	5.80E-04	6.18E-04	7.00E-04	7.99E-04	6.93E-04	5.17E-04	3.88E-04	3.52E-04	2.94E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0025***	***0.0048***	***0.0043***	***0.0039***	***0.0037***	***0.0048***	***0.0043***	***0.0048***	***0.0052***	***0.0055***	***0.0063***	***0.0073***	***0.0064***	***0.0046***	***0.0034***	***0.0030***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.73E-04	4.46E-04	3.03E-04	2.30E-04	1.99E-04	2.90E-04	6.30E-04	1.69E-03	3.22E-03	2.86E-03	2.63E-03	2.44E-03	3.22E-03	2.85E-03	3.20E-03	3.48E-03	3.69E-03	4.22E-03	4.87E-03	4.26E-03	3.09E-03	2.25E-03	2.02E-03	1.72E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.86E-04	2.23E-04	1.52E-04	1.15E-04	9.94E-05	1.45E-04	3.15E-04	8.45E-04	1.61E-03	1.43E-03	1.32E-03	1.22E-03	1.61E-03	1.43E-03	1.60E-03	1.74E-03	1.84E-03	2.11E-03	2.44E-03	2.13E-03	1.54E-03	1.13E-03	1.01E-03	8.58E-04
	Emission in each Box of 1st jet	g/s	3.58E-05	2.79E-05	1.89E-05	1.44E-05	1.24E-05	1.81E-05	3.94E-05	1.06E-04	2.01E-04	1.78E-04	1.65E-04	1.53E-04	2.01E-04	1.78E-04	2.00E-04	2.18E-04	2.30E-04	2.64E-04	3.04E-04	2.66E-04	1.93E-04	1.41E-04	1.26E-04	1.07E-04
	Emission in each Box of 2nd jet	g/s	1.91E-05	1.49E-05	1.01E-05	7.66E-06	6.63E-06	9.68E-06	2.10E-05	5.64E-05	1.07E-04	9.52E-05	8.78E-05	8.13E-05	1.07E-04	9.51E-05	1.07E-04	1.16E-04	1.23E-04	1.41E-04	1.62E-04	1.42E-04	1.03E-04	7.51E-05	6.74E-05	5.72E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1792	0.1476	0.1489	0.1540	0.1644	0.3151	0.3339	0.2806	0.3051	0.2811	0.2843	0.2748	0.2632	0.2545	0.2658	0.2765	0.2725	0.2883	0.3106	0.2786	0.2643	0.2415	0.2335	0.2210
	NO2	g/vehicle/km	0.0328	0.0313	0.0309	0.0315	0.0331	0.0412	0.0418	0.0435	0.0562	0.0516	0.0520	0.0496	0.0526	0.0506	0.0531	0.0553	0.0541	0.0578	0.0631	0.0570	0.0526	0.0466	0.0447	0.0429
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0047***	***0.0031***	***0.0022***	***0.0017***	***0.0015***	***0.0034***	***0.0076***	***0.0162***	***0.0264***	***0.0236***	***0.0218***	***0.0202***	***0.0244***	***0.0221***	***0.0244***	***0.0267***	***0.0275***	***0.0314***	***0.0358***	***0.0308***	***0.0239***	***0.0179***	***0.0162***	***0.0136***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.10E-03	2.09E-03	1.45E-03	1.11E-03	1.00E-03	2.26E-03	5.08E-03	1.08E-02	1.76E-02	1.57E-02	1.46E-02	1.35E-02	1.63E-02	1.47E-02	1.63E-02	1.78E-02	1.84E-02	2.09E-02	2.38E-02	2.06E-02	1.60E-02	1.19E-02	1.08E-02	9.04E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.55E-03	1.05E-03	7.24E-04	5.55E-04	5.01E-04	1.13E-03	2.54E-03	5.38E-03	8.79E-03	7.86E-03	7.28E-03	6.74E-03	8.13E-03	7.36E-03	8.15E-03	8.91E-03	9.18E-03	1.05E-02	1.19E-02	1.03E-02	7.98E-03	5.96E-03	5.40E-03	4.52E-03
	Emission in each Box of 1st jet	g/s	1.94E-04	1.31E-04	9.05E-05	6.94E-05	6.27E-05	1.41E-04	3.18E-04	6.73E-04	1.10E-03	9.82E-04	9.10E-04	8.42E-04	1.02E-03	9.20E-04	1.02E-03	1.11E-03	1.15E-03	1.31E-03	1.49E-03	1.28E-03	9.98E-04	7.45E-04	6.75E-04	5.65E-04
	Emission in each Box of 2nd jet	g/s	1.03E-04	6.97E-05	4.83E-05	3.70E-05	3.34E-05	7.52E-05	1.69E-04	3.59E-04	5.86E-04	5.24E-04	4.85E-04	4.49E-04	5.42E-04	4.91E-04	5.43E-04	5.94E-04	6.12E-04	6.98E-04	7.95E-04	6.85E-04	5.32E-04	3.97E-04	3.60E-04	3.01E-04
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0004***	***0.0010***	***0.0025***	***0.0049***	***0.0043***	***0.0040***	***0.0037***	***0.0049***	***0.0044***	***0.0049***	***0.0053***	***0.0055***	***0.0063***	***0.0073***	***0.0063***	***0.0048***	***0.0035***	***0.0031***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.69E-04	4.43E-04	3.01E-04	2.27E-04	2.02E-04	2.95E-04	6.37E-04	1.67E-03	3.24E-03	2.89E-03	2.66E-03	2.43E-03	3.25E-03	2.92E-03	3.26E-03	3.56E-03	3.65E-03	4.20E-03	4.85E-03	4.20E-03	3.18E-03	2.30E-03	2.07E-03	1.75E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.84E-04	2.21E-04	1.50E-04	1.13E-04	1.01E-04	1.47E-04	3.18E-04	8.35E-04	1.62E-03	1.44E-03	1.33E-03	1.22E-03	1.62E-03	1.46E-03	1.63E-03	1.78E-03	1.82E-03	2.10E-03	2.42E-03	2.10E-03	1.59E-03	1.15E-03	1.03E-03	8.76E-04
	Emission in each Box of 1st jet	g/s	3.55E-05	2.77E-05	1.88E-05	1.42E-05	1.26E-05	1.84E-05	3.98E-05	1.04E-04	2.02E-04	1.80E-04	1.66E-04	1.52E-04	2.03E-04	1.83E-04	2.04E-04	2.23E-04	2.28E-04	2.62E-04	3.03E-04	2.63E-04	1.98E-04	1.44E-04	1.29E-04	1.10E-04
	Emission in each Box of 2nd jet	g/s	1.90E-05	1.48E-05	1.00E-05	7.56E-06	6.73E-06	9.83E-06	2.12E-05	5.57E-05	1.08E-04	9.62E-05	8.87E-05	8.11E-05	1.08E-04	9.75E-05	1.09E-04	1.19E-04	1.22E-04	1.40E-04	1.62E-04	1.40E-04	1.06E-04	7.67E-05	6.89E-05	5.84E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2021	0.1678	0.1687	0.1760	0.1813	0.3481	0.3702	0.3217	0.3455	0.3182	0.3095	0.3063	0.2947	0.2793	0.2936	0.3039	0.3033	0.3202	0.3472	0.3160	0.2912	0.2676	0.2591	0.2442
	NO2	g/vehicle/km	0.0368	0.0352	0.0347	0.0356	0.0362	0.0452	0.0461	0.0496	0.0633	0.0581	0.0564	0.0551	0.0586	0.0552	0.0585	0.0605	0.0600	0.0640	0.0703	0.0643	0.0577	0.0514	0.0493	0.0472
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0052***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0037***	***0.0085***	***0.0185***	***0.0299***	***0.0267***	***0.0238***	***0.0225***	***0.0273***	***0.0242***	***0.0270***	***0.0294***	***0.0307***	***0.0349***	***0.0400***	***0.0350***	***0.0264***	***0.0198***	***0.0180***	***0.0150***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.50E-03	2.38E-03	1.64E-03	1.27E-03	1.11E-03	2.49E-03	5.64E-03	1.23E-02	1.99E-02	1.78E-02	1.59E-02	1.50E-02	1.82E-02	1.62E-02	1.80E-02	1.96E-02	2.04E-02	2.33E-02	2.67E-02	2.33E-02	1.76E-02	1.32E-02	1.20E-02	9.99E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.75E-03	1.19E-03	8.20E-04	6.34E-04	5.53E-04	1.25E-03	2.82E-03	6.17E-03	9.95E-03	8.90E-03	7.93E-03	7.51E-03	9.10E-03	8.08E-03	9.00E-03	9.80E-03	1.02E-02	1.16E-02	1.33E-02	1.17E-02	8.79E-03	6.61E-03	5.99E-03	4.99E-03
	Emission in each Box of 1st jet	g/s	2.19E-04	1.49E-04	1.03E-04	7.93E-05	6.91E-05	1.56E-04	3.52E-04	7.72E-04	1.24E-03	1.11E-03	9.91E-04	9.39E-04	1.14E-03	1.01E-03	1.12E-03	1.22E-03	1.28E-03	1.45E-03	1.67E-03	1.46E-03	1.10E-03	8.26E-04	7.49E-04	6.24E-04
	Emission in each Box of 2nd jet	g/s	1.17E-04	7.92E-05	5.47E-05	4.23E-05	3.69E-05	8.31E-05	1.88E-04	4.12E-04	6.63E-04	5.93E-04	5.28E-04	5.01E-04	6.07E-04	5.38E-04	6.00E-04	6.53E-04	6.81E-04	7.75E-04	8.88E-04	7.77E-04	5.86E-04	4.41E-04	4.00E-04	3.33E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0029***	***0.0055***	***0.0049***	***0.0043***	***0.0041***	***0.0054***	***0.0048***	***0.0054***	***0.0059***	***0.0061***	***0.0070***	***0.0081***	***0.0071***	***0.0052***	***0.0038***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.37E-04	4.99E-04	3.37E-04	2.56E-04	2.21E-04	3.24E-04	7.02E-04	1.90E-03	3.65E-03	3.25E-03	2.89E-03	2.70E-03	3.62E-03	3.19E-03	3.58E-03	3.90E-03	4.04E-03	4.65E-03	5.39E-03	4.74E-03	3.48E-03	2.54E-03	2.28E-03	1.93E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.19E-04	2.49E-04	1.69E-04	1.28E-04	1.10E-04	1.62E-04	3.51E-04	9.51E-04	1.82E-03	1.63E-03	1.44E-03	1.35E-03	1.81E-03	1.60E-03	1.79E-03	1.95E-03	2.02E-03	2.32E-03	2.70E-03	2.37E-03	1.74E-03	1.27E-03	1.14E-03	9.64E-04
	Emission in each Box of 1st jet	g/s	3.98E-05	3.12E-05	2.11E-05	1.60E-05	1.38E-05	2.03E-05	4.39E-05	1.19E-04	2.28E-04	2.03E-04	1.81E-04	1.69E-04	2.26E-04	2.00E-04	2.24E-04	2.44E-04	2.53E-04	2.90E-04	3.37E-04	2.96E-04	2.18E-04	1.59E-04	1.43E-04	1.21E-04
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.66E-05	1.12E-05	8.54E-06	7.36E-06	1.08E-05	2.34E-05	6.34E-05	1.22E-04	1.08E-04	9.63E-05	9.01E-05	1.21E-04	1.06E-04	1.19E-04	1.30E-04	1.35E-04	1.55E-04	1.80E-04	1.58E-04	1.16E-04	8.46E-05	7.61E-05	6.43E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involved	085P2
Road Located	087
Vehicle EF Adopted	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2216	0.1864	0.1877	0.1979	0.2047	0.3922	0.4163	0.3608	0.3886	0.3592	0.3494	0.3436	0.3260	0.3090	0.3249	0.3365	0.3341	0.3588	0.3814	0.3522	0.3229	0.2968	0.2877	0.2723
	NO2	g/vehicle/km	0.0401	0.0388	0.0383	0.0396	0.0405	0.0507	0.0516	0.0553	0.0709	0.0652	0.0633	0.0615	0.0646	0.0609	0.0644	0.0668	0.0658	0.0713	0.0768	0.0712	0.0636	0.0567	0.0544	0.0523
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0058***	***0.0040***	***0.0027***	***0.0021***	***0.0019***	***0.0042***	***0.0095***	***0.0208***	***0.0336***	***0.0301***	***0.0268***	***0.0253***	***0.0302***	***0.0268***	***0.0299***	***0.0325***	***0.0338***	***0.0391***	***0.0439***	***0.0390***	***0.0292***	***0.0220***	***0.0200***	***0.0167***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.84E-03	2.64E-03	1.83E-03	1.43E-03	1.25E-03	2.81E-03	6.34E-03	1.38E-02	2.24E-02	2.01E-02	1.79E-02	1.69E-02	2.01E-02	1.79E-02	1.99E-02	2.17E-02	2.25E-02	2.61E-02	2.93E-02	2.60E-02	1.95E-02	1.47E-02	1.33E-02	1.11E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.92E-03	1.32E-03	9.13E-04	7.13E-04	6.24E-04	1.40E-03	3.17E-03	6.92E-03	1.12E-02	1.00E-02	8.95E-03	8.43E-03	1.01E-02	8.93E-03	9.95E-03	1.08E-02	1.13E-02	1.30E-02	1.46E-02	1.30E-02	9.75E-03	7.33E-03	6.66E-03	5.57E-03
	Emission in each Box of 1st jet	g/s	2.40E-04	1.65E-04	1.14E-04	8.91E-05	7.80E-05	1.76E-04	3.96E-04	8.65E-04	1.40E-03	1.25E-03	1.12E-03	1.05E-03	1.26E-03	1.12E-03	1.24E-03	1.36E-03	1.41E-03	1.63E-03	1.83E-03	1.62E-03	1.22E-03	9.16E-04	8.32E-04	6.96E-04
	Emission in each Box of 2nd jet	g/s	1.28E-04	8.80E-05	6.08E-05	4.75E-05	4.16E-05	9.37E-05	2.11E-04	4.62E-04	7.46E-04	6.69E-04	5.97E-04	5.62E-04	6.72E-04	5.96E-04	6.64E-04	7.23E-04	7.50E-04	8.68E-04	9.76E-04	8.66E-04	6.50E-04	4.89E-04	4.44E-04	3.71E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0012***	***0.0032***	***0.0061***	***0.0055***	***0.0049***	***0.0045***	***0.0060***	***0.0053***	***0.0059***	***0.0065***	***0.0067***	***0.0078***	***0.0088***	***0.0079***	***0.0058***	***0.0042***	***0.0038***	***0.0032***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.94E-04	5.50E-04	3.72E-04	2.85E-04	2.47E-04	3.63E-04	7.86E-04	2.12E-03	4.08E-03	3.65E-03	3.24E-03	3.02E-03	3.99E-03	3.52E-03	3.95E-03	4.30E-03	4.44E-03	5.18E-03	5.90E-03	5.26E-03	3.84E-03	2.80E-03	2.52E-03	2.14E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.47E-04	2.75E-04	1.86E-04	1.43E-04	1.23E-04	1.81E-04	3.93E-04	1.06E-03	2.04E-03	1.82E-03	1.62E-03	1.51E-03	2.00E-03	1.76E-03	1.97E-03	2.15E-03	2.22E-03	2.59E-03	2.95E-03	2.63E-03	1.92E-03	1.40E-03	1.26E-03	1.07E-03
	Emission in each Box of 1st jet	g/s	4.34E-05	3.43E-05	2.33E-05	1.78E-05	1.54E-05	2.27E-05	4.91E-05	1.33E-04	2.55E-04	2.28E-04	2.03E-04	1.88E-04	2.49E-04	2.20E-04	2.47E-04	2.69E-04	2.77E-04	3.24E-04	3.69E-04	3.28E-04	2.40E-04	1.75E-04	1.57E-04	1.34E-04
	Emission in each Box of 2nd jet	g/s	2.31E-05	1.83E-05	1.24E-05	9.51E-06	8.22E-06	1.21E-05	2.62E-05	7.08E-05	1.36E-04	1.22E-04	1.08E-04	1.01E-04	1.33E-04	1.17E-04	1.32E-04	1.43E-04	1.48E-04	1.73E-04	1.97E-04	1.75E-04	1.28E-04	9.33E-05	8.40E-05	7.12E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085B01-085B31
Enclosure Involvec	085P2
Road Located	087
Vehicle EF Adopte	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	406	332	228	169	143	168	357	900	1351	1311	1201	1150	1449	1356	1437	1512	1580	1703	1800	1730	1416	1158	1085	959
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2337	0.1953	0.1968	0.2062	0.2158	0.4105	0.4344	0.3762	0.4049	0.3738	0.3626	0.3573	0.3382	0.3206	0.3381	0.3494	0.3466	0.3713	0.3985	0.3636	0.3345	0.3068	0.3012	0.2851
	NO2	g/vehicle/km	0.0420	0.0403	0.0398	0.0409	0.0423	0.0528	0.0536	0.0574	0.0735	0.0676	0.0656	0.0638	0.0669	0.0630	0.0669	0.0692	0.0681	0.0736	0.0800	0.0733	0.0656	0.0584	0.0567	0.0544
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Number of 2nd 50m Box	#	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NO Emission Rate		g/s	***0.0061***	***0.0041***	***0.0029***	***0.0022***	***0.0020***	***0.0044***	***0.0099***	***0.0217***	***0.0350***	***0.0313***	***0.0279***	***0.0263***	***0.0314***	***0.0278***	***0.0311***	***0.0338***	***0.0350***	***0.0404***	***0.0459***	***0.0402***	***0.0303***	***0.0227***	***0.0209***	***0.0175***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.05E-03	2.76E-03	1.91E-03	1.49E-03	1.32E-03	2.94E-03	6.61E-03	1.44E-02	2.33E-02	2.09E-02	1.86E-02	1.75E-02	2.09E-02	1.85E-02	2.07E-02	2.25E-02	2.34E-02	2.70E-02	3.06E-02	2.68E-02	2.02E-02	1.52E-02	1.39E-02	1.17E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.02E-03	1.38E-03	9.57E-04	7.43E-04	6.58E-04	1.47E-03	3.31E-03	7.22E-03	1.17E-02	1.04E-02	9.29E-03	8.76E-03	1.05E-02	9.27E-03	1.04E-02	1.13E-02	1.17E-02	1.35E-02	1.53E-02	1.34E-02	1.01E-02	7.58E-03	6.97E-03	5.83E-03
	Emission in each Box of 1st jet	g/s	2.53E-04	1.73E-04	1.20E-04	9.29E-05	8.22E-05	1.84E-04	4.13E-04	9.02E-04	1.46E-03	1.31E-03	1.16E-03	1.10E-03	1.31E-03	1.16E-03	1.29E-03	1.41E-03	1.46E-03	1.69E-03	1.91E-03	1.68E-03	1.26E-03	9.47E-04	8.71E-04	7.29E-04
	Emission in each Box of 2nd jet	g/s	1.35E-04	9.21E-05	6.38E-05	4.95E-05	4.39E-05	9.80E-05	2.20E-04	4.81E-04	7.78E-04	6.97E-04	6.19E-04	5.84E-04	6.97E-04	6.18E-04	6.91E-04	7.51E-04	7.79E-04	8.99E-04	1.02E-03	8.94E-04	6.73E-04	5.05E-04	4.65E-04	3.89E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0006***	***0.0012***	***0.0033***	***0.0064***	***0.0057***	***0.0050***	***0.0047***	***0.0062***	***0.0055***	***0.0061***	***0.0067***	***0.0069***	***0.0080***	***0.0092***	***0.0081***	***0.0059***	***0.0043***	***0.0039***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.28E-04	5.71E-04	3.87E-04	2.95E-04	2.58E-04	3.78E-04	8.16E-04	2.20E-03	4.24E-03	3.78E-03	3.36E-03	3.13E-03	4.13E-03	3.65E-03	4.10E-03	4.46E-03	4.59E-03	5.35E-03	6.14E-03	5.41E-03	3.96E-03	2.88E-03	2.63E-03	2.23E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.64E-04	2.85E-04	1.94E-04	1.47E-04	1.29E-04	1.89E-04	4.08E-04	1.10E-03	2.12E-03	1.89E-03	1.68E-03	1.56E-03	2.07E-03	1.82E-03	2.05E-03	2.23E-03	2.29E-03	2.67E-03	3.07E-03	2.71E-03	1.98E-03	1.44E-03	1.31E-03	1.11E-03
	Emission in each Box of 1st jet	g/s	4.55E-05	3.57E-05	2.42E-05	1.84E-05	1.61E-05	2.36E-05	5.10E-05	1.38E-04	2.65E-04	2.36E-04	2.10E-04	1.96E-04	2.58E-04	2.28E-04	2.56E-04	2.79E-04	2.87E-04	3.34E-04	3.84E-04	3.38E-04	2.48E-04	1.80E-04	1.64E-04	1.39E-04
	Emission in each Box of 2nd jet	g/s	2.43E-05	1.90E-05	1.29E-05	9.83E-06	8.60E-06	1.26E-05	2.72E-05	7.34E-05	1.41E-04	1.26E-04	1.12E-04	1.04E-04	1.38E-04	1.22E-04	1.37E-04	1.49E-04	1.53E-04	1.78E-04	2.05E-04	1.80E-04	1.32E-04	9.61E-05	8.75E-05	7.42E-05
RSP Emission Rate		g/s	***3.52E-04***	***2.31E-04***	***1.60E-04***	***1.26E-04***	***1.11E-04***	***2.70E-04***	***6.10E-04***	***1.21E-03***	***1.71E-03***	***1.57E-03***	***1.44E-03***	***1.36E-03***	***1.59E-03***	***1.47E-03***	***1.57E-03***	***1.70E-03***	***1.76E-03***	***1.99E-03***	***2.18E-03***	***1.96E-03***	***1.53E-03***	***1.23E-03***	***1.14E-03***	***9.54E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.35E-04	1.54E-04	1.07E-04	8.38E-05	7.39E-05	1.80E-04	4.07E-04	8.08E-04	1.14E-03	1.05E-03	9.57E-04	9.09E-04	1.06E-03	9.81E-04	1.05E-03	1.14E-03	1.17E-03	1.32E-03	1.45E-03	1.30E-03	1.02E-03	8.22E-04	7.57E-04	6.36E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.17E-04	7.71E-05	5.34E-05	4.19E-05	3.70E-05	8.99E-05	2.03E-04	4.04E-04	5.71E-04	5.24E-04	4.78E-04	4.55E-04	5.31E-04	4.91E-04	5.24E-04	5.68E-04	5.86E-04	6.62E-04	7.27E-04	6.52E-04	5.11E-04	4.11E-04	3.78E-04	3.18E-04
	Emission in each Box of 1st jet	g/s	1.47E-05	9.63E-06	6.68E-06	5.24E-06	4.62E-06	1.12E-05	2.54E-05	5.05E-05	7.14E-05	6.54E-05	5.98E-05	5.68E-05	6.64E-05	6.13E-05	6.55E-05	7.10E-05	7.33E-05	8.28E-05	9.09E-05	8.15E-05	6.39E-05	5.14E-05	4.73E-05	3.98E-05
	Emission in each Box of 2nd jet	g/s	7.82E-06	5.14E-06	3.56E-06	2.79E-06	2.46E-06	6.00E-06	1.36E-05	2.69E-05	3.81E-05	3.49E-05	3.19E-05	3.03E-05	3.54E-05	3.27E-05	3.50E-05	3.78E-05	3.91E-05	4.42E-05	4.85E-05	4.34E-05	3.41E-05	2.74E-05	2.52E-05	2.12E-05
FSP Emission Rate		g/s	***3.24E-04***	***2.13E-04***	***1.47E-04***	***1.16E-04***	***1.02E-04***	***2.48E-04***	***5.61E-04***	***1.12E-03***	***1.58E-03***	***1.44E-03***	***1.32E-03***	***1.25E-03***	***1.46E-03***	***1.35E-03***	***1.45E-03***	***1.57E-03***	***1.62E-03***	***1.82E-03***	***2.01E-03***	***1.79E-03***	***1.41E-03***	***1.14E-03***	***1.05E-03***	***8.79E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.16E-04	1.42E-04	9.82E-05	7.70E-05	6.80E-05	1.65E-04	3.74E-04	7.44E-04	1.05E-03	9.61E-04	8.80E-04	8.36E-04	9.77E-04	9.02E-04	9.65E-04	1.04E-03	1.08E-03	1.22E-03	1.34E-03	1.20E-03	9.40E-04	7.58E-04	6.97E-04	5.86E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.08E-04	7.09E-05	4.91E-05	3.85E-05	3.40E-05	8.27E-05	1.87E-04	3.72E-04	5.26E-04	4.80E-04	4.40E-04	4.18E-04	4.88E-04	4.51E-04	4.82E-04	5.22E-04	5.39E-04	6.08E-04	6.70E-04	5.98E-04	4.70E-04	3.79E-04	3.49E-04	2.93E-04
	Emission in each Box of 1st jet	g/s	1.35E-05	8.86E-06	6.14E-06	4.82E-06	4.25E-06	1.03E-05	2.34E-05	4.65E-05	6.57E-05	6.00E-05	5.50E-05	5.22E-05	6.10E-05	5.64E-05	6.03E-05	6.52E-05	6.74E-05	7.59E-05	8.37E-05	7.47E-05	5.87E-05	4.73E-05	4.36E-05	3.66E-05
	Emission in each Box of 2nd jet	g/s	7.19E-06	4.72E-06	3.27E-06	2.57E-06	2.27E-06	5.51E-06	1.25E-05	2.48E-05	3.51E-05	3.20E-05	2.93E-05	2.79E-05	3.26E-05	3.01E-05	3.22E-05	3.48E-05	3.59E-05	4.05E-05	4.47E-05	3.98E-05	3.13E-05	2.53E-05	2.32E-05	1.95E-05
Initial Lateral Dimension		σy	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860	1.860
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) A noise semi-enclosure (about 120m) is built between two noise enclosure. It was assumed that 2/3 of the total emission from the portal is dispersed in the first 60m box and 1/3 of the total emission is dispersed in the second 60m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																								
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2459	0.2064	0.2086	0.2186	0.2264	0.4297	0.4578	0.3935	0.4255	0.3933	0.3853	0.3765	0.3601	0.3399	0.3545	0.3706	0.3680	0.3919	0.4181	0.3817	0.3515	0.3227	0.3165	0.2990
	NO2	g/vehicle/km	0.0439	0.0423	0.0418	0.0430	0.0440	0.0550	0.0562	0.0598	0.0769	0.0708	0.0693	0.0670	0.0709	0.0665	0.0699	0.0730	0.0720	0.0774	0.0836	0.0766	0.0687	0.0611	0.0593	0.0568
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0075***	***0.0050***	***0.0036***	***0.0028***	***0.0024***	***0.0062***	***0.0143***	***0.0279***	***0.0436***	***0.0390***	***0.0353***	***0.0331***	***0.0216***	***0.0191***	***0.0211***	***0.0232***	***0.0238***	***0.0274***	***0.0308***	***0.0269***	***0.0205***	***0.0156***	***0.0143***	***0.0117***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.01E-03	3.35E-03	2.37E-03	1.86E-03	1.62E-03	4.16E-03	9.55E-03	1.86E-02	2.90E-02	2.60E-02	2.35E-02	2.21E-02	1.44E-02	1.27E-02	1.41E-02	1.54E-02	1.59E-02	1.82E-02	2.05E-02	1.79E-02	1.37E-02	1.04E-02	9.50E-03	7.82E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.51E-03	1.68E-03	1.18E-03	9.28E-04	8.11E-04	2.08E-03	4.77E-03	9.30E-03	1.45E-02	1.30E-02	1.18E-02	1.10E-02	7.21E-03	6.37E-03	7.04E-03	7.72E-03	7.94E-03	9.12E-03	1.03E-02	8.96E-03	6.83E-03	5.20E-03	4.75E-03	3.91E-03
	Emission in each Box of 1st jet	g/s	7.16E-04	4.79E-04	3.38E-04	2.65E-04	2.32E-04	5.94E-04	1.36E-03	2.66E-03	4.15E-03	3.71E-03	3.36E-03	3.15E-03	2.06E-03	1.82E-03	2.01E-03	2.21E-03	2.27E-03	2.61E-03	2.93E-03	2.56E-03	1.95E-03	1.48E-03	1.36E-03	1.12E-03
	Emission in each Box of 2nd jet	g/s	4.18E-04	2.80E-04	1.97E-04	1.55E-04	1.35E-04	3.47E-04	7.96E-04	1.55E-03	2.42E-03	2.17E-03	1.96E-03	1.84E-03	1.20E-03	1.06E-03	1.17E-03	1.29E-03	1.32E-03	1.52E-03	1.71E-03	1.49E-03	1.14E-03	8.66E-04	7.92E-04	6.51E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0042***	***0.0079***	***0.0070***	***0.0063***	***0.0059***	***0.0043***	***0.0037***	***0.0042***	***0.0046***	***0.0047***	***0.0054***	***0.0062***	***0.0054***	***0.0040***	***0.0030***	***0.0027***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.96E-04	6.87E-04	4.75E-04	3.65E-04	3.15E-04	5.33E-04	1.17E-03	2.82E-03	5.25E-03	4.68E-03	4.23E-03	3.92E-03	2.84E-03	2.49E-03	2.78E-03	3.04E-03	3.11E-03	3.60E-03	4.11E-03	3.60E-03	2.67E-03	1.97E-03	1.78E-03	1.49E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.48E-04	3.44E-04	2.37E-04	1.83E-04	1.58E-04	2.66E-04	5.86E-04	1.41E-03	2.62E-03	2.34E-03	2.11E-03	1.96E-03	1.42E-03	1.25E-03	1.39E-03	1.52E-03	1.55E-03	1.80E-03	2.05E-03	1.80E-03	1.33E-03	9.84E-04	8.90E-04	7.43E-04
	Emission in each Box of 1st jet	g/s	1.28E-04	9.82E-05	6.78E-05	5.21E-05	4.51E-05	7.61E-05	1.68E-04	4.03E-04	7.49E-04	6.69E-04	6.04E-04	5.61E-04	4.05E-04	3.56E-04	3.96E-04	4.35E-04	4.44E-04	5.14E-04	5.86E-04	5.14E-04	3.81E-04	2.81E-04	2.54E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	7.47E-05	5.73E-05	3.95E-05	3.04E-05	2.63E-05	4.44E-05	9.77E-05	2.35E-04	4.37E-04	3.90E-04	3.52E-04	3.27E-04	2.36E-04	2.08E-04	2.31E-04	2.54E-04	2.59E-04	3.00E-04	3.42E-04	3.00E-04	2.22E-04	1.64E-04	1.48E-04	1.24E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2300	0.1912	0.1927	0.2042	0.2112	0.4021	0.4246	0.3685	0.3949	0.3605	0.3556	0.3474	0.3324	0.3161	0.3323	0.3444	0.3416	0.3658	0.3899	0.3583	0.3297	0.3032	0.2940	0.2776
	NO2	g/vehicle/km	0.0414	0.0396	0.0391	0.0405	0.0414	0.0517	0.0524	0.0562	0.0718	0.0654	0.0643	0.0621	0.0658	0.0622	0.0658	0.0682	0.0672	0.0726	0.0784	0.0724	0.0647	0.0578	0.0555	0.0531
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0070***	***0.0047***	***0.0033***	***0.0026***	***0.0023***	***0.0058***	***0.0133***	***0.0261***	***0.0404***	***0.0357***	***0.0325***	***0.0305***	***0.0200***	***0.0178***	***0.0198***	***0.0215***	***0.0221***	***0.0255***	***0.0287***	***0.0252***	***0.0192***	***0.0146***	***0.0132***	***0.0109***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.69E-03	3.11E-03	2.19E-03	1.73E-03	1.51E-03	3.89E-03	8.85E-03	1.74E-02	2.69E-02	2.38E-02	2.17E-02	2.04E-02	1.33E-02	1.19E-02	1.32E-02	1.43E-02	1.47E-02	1.70E-02	1.91E-02	1.68E-02	1.28E-02	9.76E-03	8.83E-03	7.26E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.34E-03	1.55E-03	1.09E-03	8.67E-04	7.57E-04	1.95E-03	4.43E-03	8.71E-03	1.35E-02	1.19E-02	1.08E-02	1.02E-02	6.66E-03	5.93E-03	6.60E-03	7.17E-03	7.37E-03	8.51E-03	9.57E-03	8.41E-03	6.40E-03	4.88E-03	4.41E-03	3.63E-03
	Emission in each Box of 1st jet	g/s	6.70E-04	4.44E-04	3.12E-04	2.48E-04	2.16E-04	5.56E-04	1.26E-03	2.49E-03	3.85E-03	3.40E-03	3.10E-03	2.91E-03	1.90E-03	1.69E-03	1.88E-03	2.05E-03	2.11E-03	2.43E-03	2.73E-03	2.40E-03	1.83E-03	1.39E-03	1.26E-03	1.04E-03
	Emission in each Box of 2nd jet	g/s	3.91E-04	2.59E-04	1.82E-04	1.44E-04	1.26E-04	3.24E-04	7.38E-04	1.45E-03	2.25E-03	1.99E-03	1.81E-03	1.70E-03	1.11E-03	9.88E-04	1.10E-03	1.20E-03	1.23E-03	1.42E-03	1.59E-03	1.40E-03	1.07E-03	8.13E-04	7.36E-04	6.05E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0008***	***0.0016***	***0.0040***	***0.0073***	***0.0065***	***0.0059***	***0.0055***	***0.0040***	***0.0035***	***0.0039***	***0.0043***	***0.0044***	***0.0051***	***0.0058***	***0.0051***	***0.0038***	***0.0028***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.44E-04	6.43E-04	4.43E-04	3.44E-04	2.97E-04	5.01E-04	1.09E-03	2.66E-03	4.90E-03	4.32E-03	3.93E-03	3.64E-03	2.63E-03	2.33E-03	2.61E-03	2.84E-03	2.90E-03	3.38E-03	3.85E-03	3.40E-03	2.52E-03	1.86E-03	1.67E-03	1.39E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.22E-04	3.21E-04	2.22E-04	1.72E-04	1.48E-04	2.50E-04	5.47E-04	1.33E-03	2.45E-03	2.16E-03	1.96E-03	1.82E-03	1.32E-03	1.17E-03	1.31E-03	1.42E-03	1.45E-03	1.69E-03	1.92E-03	1.70E-03	1.26E-03	9.30E-04	8.33E-04	6.94E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	9.18E-05	6.33E-05	4.91E-05	4.24E-05	7.15E-05	1.56E-04	3.80E-04	7.00E-04	6.18E-04	5.61E-04	5.20E-04	3.76E-04	3.33E-04	3.73E-04	4.06E-04	4.14E-04	4.82E-04	5.50E-04	4.85E-04	3.59E-04	2.66E-04	2.38E-04	1.98E-04
	Emission in each Box of 2nd jet	g/s	7.03E-05	5.36E-05	3.69E-05	2.87E-05	2.47E-05	4.17E-05	9.11E-05	2.21E-04	4.08E-04	3.60E-04	3.27E-04	3.03E-04	2.20E-04	1.94E-04	2.18E-04	2.37E-04	2.42E-04	2.81E-04	3.21E-04	2.83E-04	2.10E-04	1.55E-04	1.39E-04	1.16E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2171	0.1806	0.1824	0.1905	0.1970	0.3769	0.3990	0.3469	0.3727	0.3434	0.3348	0.3315	0.3173	0.2972	0.3125	0.3277	0.3216	0.3462	0.3716	0.3387	0.3104	0.2853	0.2765	0.2617
	NO2	g/vehicle/km	0.0393	0.0377	0.0372	0.0382	0.0390	0.0487	0.0495	0.0532	0.0681	0.0625	0.0608	0.0595	0.0629	0.0587	0.0620	0.0650	0.0634	0.0689	0.0750	0.0687	0.0612	0.0546	0.0524	0.0503
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0066***	***0.0044***	***0.0031***	***0.0024***	***0.0021***	***0.0055***	***0.0125***	***0.0246***	***0.0381***	***0.0340***	***0.0306***	***0.0291***	***0.0191***	***0.0167***	***0.0186***	***0.0205***	***0.0208***	***0.0242***	***0.0274***	***0.0239***	***0.0181***	***0.0138***	***0.0125***	***0.0103***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.43E-03	2.93E-03	2.07E-03	1.62E-03	1.41E-03	3.65E-03	8.32E-03	1.64E-02	2.54E-02	2.27E-02	2.04E-02	1.94E-02	1.27E-02	1.11E-02	1.24E-02	1.37E-02	1.39E-02	1.61E-02	1.82E-02	1.59E-02	1.21E-02	9.18E-03	8.30E-03	6.84E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.21E-03	1.47E-03	1.03E-03	8.08E-04	7.06E-04	1.82E-03	4.16E-03	8.20E-03	1.27E-02	1.13E-02	1.02E-02	9.71E-03	6.35E-03	5.57E-03	6.20E-03	6.83E-03	6.94E-03	8.05E-03	9.12E-03	7.95E-03	6.03E-03	4.59E-03	4.15E-03	3.42E-03
	Emission in each Box of 1st jet	g/s	6.32E-04	4.19E-04	2.96E-04	2.31E-04	2.02E-04	5.21E-04	1.19E-03	2.34E-03	3.63E-03	3.24E-03	2.92E-03	2.77E-03	1.82E-03	1.59E-03	1.77E-03	1.95E-03	1.98E-03	2.30E-03	2.61E-03	2.27E-03	1.72E-03	1.31E-03	1.19E-03	9.77E-04
	Emission in each Box of 2nd jet	g/s	3.69E-04	2.45E-04	1.72E-04	1.35E-04	1.18E-04	3.04E-04	6.93E-04	1.37E-03	2.12E-03	1.89E-03	1.70E-03	1.62E-03	1.06E-03	9.28E-04	1.03E-03	1.14E-03	1.16E-03	1.34E-03	1.52E-03	1.33E-03	1.00E-03	7.65E-04	6.92E-04	5.70E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0038***	***0.0070***	***0.0062***	***0.0056***	***0.0052***	***0.0038***	***0.0033***	***0.0037***	***0.0041***	***0.0041***	***0.0048***	***0.0055***	***0.0048***	***0.0036***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.01E-04	6.12E-04	4.22E-04	3.24E-04	2.80E-04	4.72E-04	1.03E-03	2.52E-03	4.64E-03	4.13E-03	3.71E-03	3.48E-03	2.52E-03	2.20E-03	2.46E-03	2.71E-03	2.74E-03	3.21E-03	3.68E-03	3.22E-03	2.38E-03	1.76E-03	1.57E-03	1.32E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.01E-04	3.06E-04	2.11E-04	1.62E-04	1.40E-04	2.36E-04	5.16E-04	1.26E-03	2.32E-03	2.07E-03	1.86E-03	1.74E-03	1.26E-03	1.10E-03	1.23E-03	1.35E-03	1.37E-03	1.60E-03	1.84E-03	1.61E-03	1.19E-03	8.79E-04	7.87E-04	6.58E-04
	Emission in each Box of 1st jet	g/s	1.14E-04	8.74E-05	6.03E-05	4.63E-05	3.99E-05	6.74E-05	1.48E-04	3.59E-04	6.63E-04	5.90E-04	5.30E-04	4.98E-04	3.60E-04	3.14E-04	3.52E-04	3.87E-04	3.91E-04	4.58E-04	5.26E-04	4.61E-04	3.40E-04	2.51E-04	2.25E-04	1.88E-04
	Emission in each Box of 2nd jet	g/s	6.68E-05	5.10E-05	3.52E-05	2.70E-05	2.33E-05	3.93E-05	8.61E-05	2.10E-04	3.87E-04	3.44E-04	3.09E-04	2.90E-04	2.10E-04	1.83E-04	2.05E-04	2.26E-04	2.28E-04	2.67E-04	3.07E-04	2.69E-04	1.98E-04	1.46E-04	1.31E-04	1.10E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																								
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2040	0.1694	0.1704	0.1822	0.1885	0.3627	0.3840	0.3307	0.3552	0.3274	0.3189	0.3152	0.3018	0.2873	0.3021	0.3114	0.3119	0.3297	0.3541	0.3211	0.2947	0.2752	0.2657	0.2505
	NO2	g/vehicle/km	0.0372	0.0356	0.0351	0.0367	0.0375	0.0470	0.0478	0.0509	0.0650	0.0597	0.0580	0.0566	0.0600	0.0568	0.0601	0.0620	0.0616	0.0657	0.0716	0.0653	0.0584	0.0528	0.0505	0.0483
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0062***	***0.0041***	***0.0029***	***0.0023***	***0.0020***	***0.0053***	***0.0120***	***0.0234***	***0.0364***	***0.0325***	***0.0292***	***0.0277***	***0.0181***	***0.0162***	***0.0180***	***0.0195***	***0.0202***	***0.0230***	***0.0261***	***0.0226***	***0.0172***	***0.0133***	***0.0120***	***0.0098***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.16E-03	2.75E-03	1.93E-03	1.55E-03	1.35E-03	3.51E-03	8.01E-03	1.56E-02	2.42E-02	2.16E-02	1.95E-02	1.85E-02	1.21E-02	1.08E-02	1.20E-02	1.30E-02	1.35E-02	1.53E-02	1.74E-02	1.51E-02	1.15E-02	8.86E-03	7.98E-03	6.55E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.08E-03	1.38E-03	9.66E-04	7.73E-04	6.75E-04	1.76E-03	4.00E-03	7.81E-03	1.21E-02	1.08E-02	9.73E-03	9.24E-03	6.04E-03	5.38E-03	6.00E-03	6.49E-03	6.73E-03	7.67E-03	8.69E-03	7.54E-03	5.73E-03	4.43E-03	3.99E-03	3.27E-03
	Emission in each Box of 1st jet	g/s	5.94E-04	3.93E-04	2.76E-04	2.21E-04	1.93E-04	5.02E-04	1.14E-03	2.23E-03	3.46E-03	3.09E-03	2.78E-03	2.64E-03	1.73E-03	1.54E-03	1.71E-03	1.85E-03	1.92E-03	2.19E-03	2.48E-03	2.15E-03	1.64E-03	1.27E-03	1.14E-03	9.35E-04
	Emission in each Box of 2nd jet	g/s	3.46E-04	2.29E-04	1.61E-04	1.29E-04	1.13E-04	2.93E-04	6.67E-04	1.30E-03	2.02E-03	1.80E-03	1.62E-03	1.54E-03	1.01E-03	8.97E-04	1.00E-03	1.08E-03	1.12E-03	1.28E-03	1.45E-03	1.26E-03	9.54E-04	7.39E-04	6.65E-04	5.46E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0015***	***0.0036***	***0.0067***	***0.0059***	***0.0053***	***0.0050***	***0.0036***	***0.0032***	***0.0036***	***0.0039***	***0.0040***	***0.0046***	***0.0053***	***0.0046***	***0.0034***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.57E-04	5.78E-04	3.98E-04	3.12E-04	2.69E-04	4.55E-04	9.97E-04	2.40E-03	4.44E-03	3.95E-03	3.54E-03	3.32E-03	2.40E-03	2.13E-03	2.38E-03	2.58E-03	2.66E-03	3.06E-03	3.51E-03	3.06E-03	2.27E-03	1.70E-03	1.52E-03	1.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.79E-04	2.89E-04	1.99E-04	1.56E-04	1.34E-04	2.28E-04	4.98E-04	1.20E-03	2.22E-03	1.97E-03	1.77E-03	1.66E-03	1.20E-03	1.06E-03	1.19E-03	1.29E-03	1.33E-03	1.53E-03	1.76E-03	1.53E-03	1.13E-03	8.49E-04	7.58E-04	6.31E-04
	Emission in each Box of 1st jet	g/s	1.08E-04	8.26E-05	5.68E-05	4.45E-05	3.84E-05	6.51E-05	1.42E-04	3.43E-04	6.34E-04	5.64E-04	5.06E-04	4.74E-04	3.43E-04	3.04E-04	3.41E-04	3.69E-04	3.80E-04	4.37E-04	5.02E-04	4.38E-04	3.24E-04	2.43E-04	2.17E-04	1.80E-04
	Emission in each Box of 2nd jet	g/s	6.31E-05	4.82E-05	3.31E-05	2.60E-05	2.24E-05	3.79E-05	8.30E-05	2.00E-04	3.70E-04	3.29E-04	2.95E-04	2.77E-04	2.00E-04	1.77E-04	1.99E-04	2.15E-04	2.22E-04	2.55E-04	2.93E-04	2.55E-04	1.89E-04	1.42E-04	1.26E-04	1.05E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1834	0.1512	0.1526	0.1589	0.1644	0.3168	0.3315	0.2876	0.3131	0.2870	0.2843	0.2805	0.2704	0.2562	0.2713	0.2784	0.2780	0.2982	0.3126	0.2885	0.2643	0.2401	0.2335	0.2197
	NO2	g/vehicle/km	0.0336	0.0321	0.0317	0.0324	0.0331	0.0414	0.0415	0.0445	0.0576	0.0526	0.0520	0.0506	0.0540	0.0509	0.0542	0.0556	0.0552	0.0597	0.0635	0.0589	0.0526	0.0464	0.0447	0.0426
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0056***	***0.0037***	***0.0026***	***0.0020***	***0.0018***	***0.0046***	***0.0104***	***0.0204***	***0.0320***	***0.0285***	***0.0260***	***0.0247***	***0.0162***	***0.0144***	***0.0162***	***0.0174***	***0.0180***	***0.0208***	***0.0230***	***0.0203***	***0.0154***	***0.0116***	***0.0105***	***0.0086***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.74E-03	2.46E-03	1.73E-03	1.35E-03	1.18E-03	3.07E-03	6.91E-03	1.36E-02	2.14E-02	1.90E-02	1.73E-02	1.64E-02	1.08E-02	9.60E-03	1.08E-02	1.16E-02	1.20E-02	1.39E-02	1.53E-02	1.35E-02	1.03E-02	7.73E-03	7.01E-03	5.74E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.87E-03	1.23E-03	8.65E-04	6.74E-04	5.89E-04	1.53E-03	3.46E-03	6.79E-03	1.07E-02	9.49E-03	8.67E-03	8.22E-03	5.41E-03	4.80E-03	5.39E-03	5.80E-03	6.00E-03	6.94E-03	7.67E-03	6.77E-03	5.13E-03	3.86E-03	3.50E-03	2.87E-03
	Emission in each Box of 1st jet	g/s	5.34E-04	3.51E-04	2.47E-04	1.93E-04	1.68E-04	4.38E-04	9.87E-04	1.94E-03	3.05E-03	2.71E-03	2.48E-03	2.35E-03	1.55E-03	1.37E-03	1.54E-03	1.66E-03	1.71E-03	1.98E-03	2.19E-03	1.93E-03	1.47E-03	1.10E-03	1.00E-03	8.20E-04
	Emission in each Box of 2nd jet	g/s	3.12E-04	2.05E-04	1.44E-04	1.12E-04	9.82E-05	2.56E-04	5.76E-04	1.13E-03	1.78E-03	1.58E-03	1.45E-03	1.37E-03	9.02E-04	8.00E-04	8.98E-04	9.67E-04	1.00E-03	1.16E-03	1.28E-03	1.13E-03	8.56E-04	6.44E-04	5.84E-04	4.79E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0013***	***0.0032***	***0.0059***	***0.0052***	***0.0048***	***0.0044***	***0.0032***	***0.0029***	***0.0032***	***0.0035***	***0.0036***	***0.0042***	***0.0047***	***0.0041***	***0.0031***	***0.0022***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.85E-04	5.21E-04	3.60E-04	2.75E-04	2.37E-04	4.00E-04	8.66E-04	2.10E-03	3.93E-03	3.48E-03	3.17E-03	2.97E-03	2.16E-03	1.91E-03	2.15E-03	2.32E-03	2.38E-03	2.78E-03	3.12E-03	2.77E-03	2.04E-03	1.49E-03	1.34E-03	1.11E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.43E-04	2.60E-04	1.80E-04	1.37E-04	1.19E-04	2.00E-04	4.33E-04	1.05E-03	1.97E-03	1.74E-03	1.59E-03	1.48E-03	1.08E-03	9.54E-04	1.08E-03	1.16E-03	1.19E-03	1.39E-03	1.56E-03	1.38E-03	1.02E-03	7.46E-04	6.70E-04	5.57E-04
	Emission in each Box of 1st jet	g/s	9.79E-05	7.44E-05	5.14E-05	3.93E-05	3.39E-05	5.72E-05	1.24E-04	3.01E-04	5.62E-04	4.97E-04	4.53E-04	4.24E-04	3.09E-04	2.72E-04	3.07E-04	3.31E-04	3.40E-04	3.97E-04	4.45E-04	3.95E-04	2.92E-04	2.13E-04	1.92E-04	1.59E-04
	Emission in each Box of 2nd jet	g/s	5.71E-05	4.34E-05	3.00E-05	2.29E-05	1.98E-05	3.34E-05	7.21E-05	1.75E-04	3.28E-04	2.90E-04	2.64E-04	2.47E-04	1.80E-04	1.59E-04	1.79E-04	1.93E-04	1.98E-04	2.32E-04	2.60E-04	2.30E-04	1.70E-04	1.24E-04	1.12E-04	9.29E-05
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1771	0.1467	0.1518	0.1580	0.1626	0.3134	0.3238	0.2841	0.3063	0.2865	0.2754	0.2717	0.2603	0.2482	0.2593	0.2698	0.2736	0.2912	0.3069	0.2852	0.2614	0.2387	0.2308	0.2184
	NO2	g/vehicle/km	0.0325	0.0311	0.0315	0.0322	0.0328	0.0409	0.0406	0.0441	0.0565	0.0526	0.0504	0.0491	0.0520	0.0494	0.0519	0.0540	0.0544	0.0584	0.0624	0.0583	0.0520	0.0461	0.0442	0.0424
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0054***	***0.0036***	***0.0026***	***0.0020***	***0.0017***	***0.0046***	***0.0101***	***0.0201***	***0.0314***	***0.0284***	***0.0252***	***0.0239***	***0.0156***	***0.0140***	***0.0154***	***0.0169***	***0.0177***	***0.0203***	***0.0226***	***0.0201***	***0.0152***	***0.0115***	***0.0104***	***0.0086***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.61E-03	2.38E-03	1.72E-03	1.34E-03	1.16E-03	3.03E-03	6.75E-03	1.34E-02	2.09E-02	1.89E-02	1.68E-02	1.59E-02	1.04E-02	9.30E-03	1.03E-02	1.12E-02	1.18E-02	1.35E-02	1.51E-02	1.34E-02	1.02E-02	7.69E-03	6.93E-03	5.71E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.81E-03	1.19E-03	8.61E-04	6.70E-04	5.82E-04	1.52E-03	3.38E-03	6.71E-03	1.05E-02	9.47E-03	8.40E-03	7.96E-03	5.21E-03	4.65E-03	5.15E-03	5.62E-03	5.90E-03	6.77E-03	7.53E-03	6.70E-03	5.08E-03	3.84E-03	3.46E-03	2.86E-03
	Emission in each Box of 1st jet	g/s	5.16E-04	3.41E-04	2.46E-04	1.92E-04	1.66E-04	4.33E-04	9.65E-04	1.92E-03	2.99E-03	2.71E-03	2.40E-03	2.27E-03	1.49E-03	1.33E-03	1.47E-03	1.61E-03	1.69E-03	1.94E-03	2.15E-03	1.91E-03	1.45E-03	1.10E-03	9.90E-04	8.16E-04
	Emission in each Box of 2nd jet	g/s	3.01E-04	1.99E-04	1.43E-04	1.12E-04	9.71E-05	2.53E-04	5.63E-04	1.12E-03	1.74E-03	1.58E-03	1.40E-03	1.33E-03	8.68E-04	7.75E-04	8.58E-04	9.37E-04	9.84E-04	1.13E-03	1.26E-03	1.12E-03	8.46E-04	6.40E-04	5.77E-04	4.76E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0013***	***0.0031***	***0.0058***	***0.0052***	***0.0046***	***0.0043***	***0.0031***	***0.0028***	***0.0031***	***0.0034***	***0.0035***	***0.0041***	***0.0046***	***0.0041***	***0.0030***	***0.0022***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.62E-04	5.05E-04	3.57E-04	2.73E-04	2.35E-04	3.96E-04	8.47E-04	2.08E-03	3.85E-03	3.48E-03	3.08E-03	2.88E-03	2.08E-03	1.85E-03	2.06E-03	2.25E-03	2.35E-03	2.72E-03	3.06E-03	2.74E-03	2.02E-03	1.48E-03	1.33E-03	1.11E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.31E-04	2.53E-04	1.79E-04	1.37E-04	1.17E-04	1.98E-04	4.24E-04	1.04E-03	1.93E-03	1.74E-03	1.54E-03	1.44E-03	1.04E-03	9.25E-04	1.03E-03	1.12E-03	1.17E-03	1.36E-03	1.53E-03	1.37E-03	1.01E-03	7.42E-04	6.63E-04	5.54E-04
	Emission in each Box of 1st jet	g/s	9.46E-05	7.22E-05	5.10E-05	3.90E-05	3.35E-05	5.66E-05	1.21E-04	2.97E-04	5.51E-04	4.97E-04	4.39E-04	4.11E-04	2.98E-04	2.64E-04	2.94E-04	3.21E-04	3.35E-04	3.88E-04	4.38E-04	3.91E-04	2.88E-04	2.12E-04	1.90E-04	1.58E-04
	Emission in each Box of 2nd jet	g/s	5.52E-05	4.21E-05	2.98E-05	2.28E-05	1.96E-05	3.30E-05	7.06E-05	1.73E-04	3.21E-04	2.90E-04	2.56E-04	2.40E-04	1.74E-04	1.54E-04	1.72E-04	1.87E-04	1.96E-04	2.26E-04	2.55E-04	2.28E-04	1.68E-04	1.24E-04	1.11E-04	9.24E-05
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1782	0.1459	0.1472	0.1530	0.1584	0.3038	0.3238	0.2771	0.2990	0.2771	0.2765	0.2747	0.2555	0.2439	0.2622	0.2709	0.2687	0.2902	0.3036	0.2820	0.2568	0.2358	0.2279	0.2130
	NO2	g/vehicle/km	0.0327	0.0309	0.0306	0.0313	0.0320	0.0398	0.0406	0.0430	0.0552	0.0509	0.0507	0.0497	0.0511	0.0485	0.0525	0.0542	0.0534	0.0582	0.0618	0.0577	0.0511	0.0456	0.0437	0.0414
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0054***	***0.0036***	***0.0025***	***0.0019***	***0.0017***	***0.0044***	***0.0101***	***0.0196***	***0.0306***	***0.0275***	***0.0253***	***0.0241***	***0.0153***	***0.0137***	***0.0156***	***0.0169***	***0.0174***	***0.0203***	***0.0224***	***0.0199***	***0.0150***	***0.0114***	***0.0103***	***0.0084***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.63E-03	2.37E-03	1.67E-03	1.30E-03	1.13E-03	2.94E-03	6.75E-03	1.31E-02	2.04E-02	1.83E-02	1.69E-02	1.61E-02	1.02E-02	9.14E-03	1.04E-02	1.13E-02	1.16E-02	1.35E-02	1.49E-02	1.32E-02	9.98E-03	7.59E-03	6.84E-03	5.57E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.82E-03	1.18E-03	8.35E-04	6.49E-04	5.67E-04	1.47E-03	3.38E-03	6.55E-03	1.02E-02	9.16E-03	8.44E-03	8.05E-03	5.12E-03	4.57E-03	5.21E-03	5.64E-03	5.80E-03	6.75E-03	7.45E-03	6.62E-03	4.99E-03	3.80E-03	3.42E-03	2.78E-03
	Emission in each Box of 1st jet	g/s	5.19E-04	3.39E-04	2.38E-04	1.86E-04	1.62E-04	4.20E-04	9.65E-04	1.87E-03	2.91E-03	2.62E-03	2.41E-03	2.30E-03	1.46E-03	1.31E-03	1.49E-03	1.61E-03	1.66E-03	1.93E-03	2.13E-03	1.89E-03	1.43E-03	1.08E-03	9.77E-04	7.95E-04
	Emission in each Box of 2nd jet	g/s	3.03E-04	1.97E-04	1.39E-04	1.08E-04	9.46E-05	2.45E-04	5.63E-04	1.09E-03	1.70E-03	1.53E-03	1.41E-03	1.34E-03	8.53E-04	7.62E-04	8.68E-04	9.41E-04	9.66E-04	1.13E-03	1.24E-03	1.10E-03	8.31E-04	6.33E-04	5.70E-04	4.64E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0030***	***0.0056***	***0.0051***	***0.0046***	***0.0044***	***0.0031***	***0.0027***	***0.0031***	***0.0034***	***0.0035***	***0.0041***	***0.0045***	***0.0041***	***0.0030***	***0.0022***	***0.0020***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.66E-04	5.03E-04	3.47E-04	2.66E-04	2.29E-04	3.85E-04	8.47E-04	2.03E-03	3.77E-03	3.37E-03	3.09E-03	2.91E-03	2.05E-03	1.82E-03	2.08E-03	2.26E-03	2.31E-03	2.71E-03	3.03E-03	2.71E-03	1.99E-03	1.47E-03	1.31E-03	1.08E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.33E-04	2.51E-04	1.74E-04	1.33E-04	1.15E-04	1.92E-04	4.24E-04	1.02E-03	1.88E-03	1.68E-03	1.55E-03	1.45E-03	1.02E-03	9.09E-04	1.04E-03	1.13E-03	1.15E-03	1.35E-03	1.52E-03	1.35E-03	9.93E-04	7.34E-04	6.55E-04	5.41E-04
	Emission in each Box of 1st jet	g/s	9.51E-05	7.18E-05	4.96E-05	3.79E-05	3.27E-05	5.50E-05	1.21E-04	2.90E-04	5.38E-04	4.81E-04	4.42E-04	4.16E-04	2.92E-04	2.60E-04	2.98E-04	3.23E-04	3.29E-04	3.87E-04	4.33E-04	3.87E-04	2.84E-04	2.10E-04	1.87E-04	1.55E-04
	Emission in each Box of 2nd jet	g/s	5.55E-05	4.19E-05	2.89E-05	2.21E-05	1.91E-05	3.21E-05	7.06E-05	1.69E-04	3.14E-04	2.81E-04	2.58E-04	2.42E-04	1.71E-04	1.52E-04	1.74E-04	1.88E-04	1.92E-04	2.26E-04	2.53E-04	2.26E-04	1.65E-04	1.22E-04	1.09E-04	9.02E-05
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1805	0.1488	0.1501	0.1562	0.1616	0.3100	0.3303	0.2841	0.3026	0.2781	0.2809	0.2752	0.2603	0.2482	0.2610	0.2698	0.2753	0.2894	0.3122	0.2820	0.2569	0.2359	0.2281	0.2159
	NO2	g/vehicle/km	0.0331	0.0315	0.0312	0.0319	0.0326	0.0405	0.0414	0.0441	0.0558	0.0511	0.0514	0.0498	0.0520	0.0494	0.0522	0.0540	0.0547	0.0581	0.0635	0.0577	0.0512	0.0456	0.0437	0.0419
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0055***	***0.0036***	***0.0026***	***0.0020***	***0.0017***	***0.0045***	***0.0103***	***0.0201***	***0.0310***	***0.0276***	***0.0257***	***0.0242***	***0.0156***	***0.0140***	***0.0155***	***0.0169***	***0.0178***	***0.0202***	***0.0230***	***0.0199***	***0.0150***	***0.0114***	***0.0103***	***0.0085***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.68E-03	2.42E-03	1.70E-03	1.33E-03	1.16E-03	3.00E-03	6.89E-03	1.34E-02	2.06E-02	1.84E-02	1.71E-02	1.61E-02	1.04E-02	9.30E-03	1.04E-02	1.12E-02	1.19E-02	1.35E-02	1.53E-02	1.32E-02	9.98E-03	7.60E-03	6.85E-03	5.64E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.84E-03	1.21E-03	8.51E-04	6.63E-04	5.79E-04	1.50E-03	3.44E-03	6.71E-03	1.03E-02	9.19E-03	8.57E-03	8.06E-03	5.21E-03	4.65E-03	5.18E-03	5.62E-03	5.94E-03	6.73E-03	7.66E-03	6.62E-03	4.99E-03	3.80E-03	3.42E-03	2.82E-03
	Emission in each Box of 1st jet	g/s	5.26E-04	3.45E-04	2.43E-04	1.89E-04	1.65E-04	4.29E-04	9.84E-04	1.92E-03	2.95E-03	2.63E-03	2.45E-03	2.30E-03	1.49E-03	1.33E-03	1.48E-03	1.61E-03	1.70E-03	1.92E-03	2.19E-03	1.89E-03	1.43E-03	1.09E-03	9.78E-04	8.06E-04
	Emission in each Box of 2nd jet	g/s	3.07E-04	2.01E-04	1.42E-04	1.10E-04	9.65E-05	2.50E-04	5.74E-04	1.12E-03	1.72E-03	1.53E-03	1.43E-03	1.34E-03	8.68E-04	7.75E-04	8.64E-04	9.37E-04	9.90E-04	1.12E-03	1.28E-03	1.10E-03	8.32E-04	6.33E-04	5.71E-04	4.70E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0013***	***0.0031***	***0.0057***	***0.0051***	***0.0047***	***0.0044***	***0.0031***	***0.0028***	***0.0031***	***0.0034***	***0.0035***	***0.0041***	***0.0047***	***0.0041***	***0.0030***	***0.0022***	***0.0020***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.74E-04	5.12E-04	3.54E-04	2.71E-04	2.34E-04	3.92E-04	8.63E-04	2.08E-03	3.81E-03	3.38E-03	3.14E-03	2.92E-03	2.08E-03	1.85E-03	2.07E-03	2.25E-03	2.36E-03	2.70E-03	3.11E-03	2.71E-03	1.99E-03	1.47E-03	1.31E-03	1.10E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.37E-04	2.56E-04	1.77E-04	1.35E-04	1.17E-04	1.96E-04	4.32E-04	1.04E-03	1.90E-03	1.69E-03	1.57E-03	1.46E-03	1.04E-03	9.25E-04	1.04E-03	1.12E-03	1.18E-03	1.35E-03	1.56E-03	1.35E-03	9.94E-04	7.34E-04	6.56E-04	5.48E-04
	Emission in each Box of 1st jet	g/s	9.63E-05	7.32E-05	5.05E-05	3.87E-05	3.34E-05	5.60E-05	1.23E-04	2.97E-04	5.44E-04	4.82E-04	4.48E-04	4.17E-04	2.98E-04	2.64E-04	2.96E-04	3.21E-04	3.37E-04	3.86E-04	4.45E-04	3.87E-04	2.84E-04	2.10E-04	1.87E-04	1.57E-04
	Emission in each Box of 2nd jet	g/s	5.62E-05	4.27E-05	2.95E-05	2.26E-05	1.95E-05	3.27E-05	7.19E-05	1.73E-04	3.17E-04	2.81E-04	2.61E-04	2.43E-04	1.74E-04	1.54E-04	1.73E-04	1.87E-04	1.97E-04	2.25E-04	2.60E-04	2.26E-04	1.66E-04	1.22E-04	1.09E-04	9.14E-05
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involvec	085P3
Road Located	088
Vehicle EF Adopte	085

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1792	0.1476	0.1489	0.1540	0.1644	0.3151	0.3339	0.2806	0.3051	0.2811	0.2843	0.2748	0.2632	0.2545	0.2658	0.2765	0.2725	0.2883	0.3106	0.2786	0.2643	0.2415	0.2335	0.2210
	NO2	g/vehicle/km	0.0328	0.0313	0.0309	0.0315	0.0331	0.0412	0.0418	0.0435	0.0562	0.0516	0.0520	0.0496	0.0526	0.0506	0.0531	0.0553	0.0541	0.0578	0.0631	0.0570	0.0526	0.0466	0.0447	0.0429
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0055***	***0.0036***	***0.0025***	***0.0020***	***0.0018***	***0.0046***	***0.0104***	***0.0199***	***0.0312***	***0.0279***	***0.0260***	***0.0242***	***0.0158***	***0.0143***	***0.0158***	***0.0173***	***0.0176***	***0.0201***	***0.0229***	***0.0196***	***0.0154***	***0.0117***	***0.0105***	***0.0087***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.65E-03	2.40E-03	1.69E-03	1.31E-03	1.18E-03	3.05E-03	6.96E-03	1.33E-02	2.08E-02	1.86E-02	1.73E-02	1.61E-02	1.05E-02	9.54E-03	1.06E-02	1.15E-02	1.18E-02	1.34E-02	1.52E-02	1.31E-02	1.03E-02	7.77E-03	7.01E-03	5.78E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.83E-03	1.20E-03	8.45E-04	6.53E-04	5.89E-04	1.53E-03	3.48E-03	6.63E-03	1.04E-02	9.29E-03	8.67E-03	8.05E-03	5.27E-03	4.77E-03	5.28E-03	5.76E-03	5.88E-03	6.71E-03	7.62E-03	6.54E-03	5.13E-03	3.89E-03	3.50E-03	2.89E-03
	Emission in each Box of 1st jet	g/s	5.22E-04	3.43E-04	2.41E-04	1.87E-04	1.68E-04	4.36E-04	9.95E-04	1.89E-03	2.97E-03	2.65E-03	2.48E-03	2.30E-03	1.51E-03	1.36E-03	1.51E-03	1.65E-03	1.68E-03	1.92E-03	2.18E-03	1.87E-03	1.47E-03	1.11E-03	1.00E-03	8.25E-04
	Emission in each Box of 2nd jet	g/s	3.04E-04	2.00E-04	1.41E-04	1.09E-04	9.82E-05	2.54E-04	5.80E-04	1.10E-03	1.73E-03	1.55E-03	1.45E-03	1.34E-03	8.78E-04	7.95E-04	8.80E-04	9.60E-04	9.80E-04	1.12E-03	1.27E-03	1.09E-03	8.56E-04	6.48E-04	5.84E-04	4.81E-04
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0006***	***0.0013***	***0.0031***	***0.0058***	***0.0051***	***0.0048***	***0.0044***	***0.0032***	***0.0028***	***0.0032***	***0.0035***	***0.0035***	***0.0040***	***0.0046***	***0.0040***	***0.0031***	***0.0023***	***0.0020***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.69E-04	5.08E-04	3.51E-04	2.67E-04	2.37E-04	3.98E-04	8.72E-04	2.06E-03	3.84E-03	3.41E-03	3.17E-03	2.91E-03	2.11E-03	1.90E-03	2.11E-03	2.30E-03	2.34E-03	2.69E-03	3.10E-03	2.68E-03	2.04E-03	1.50E-03	1.34E-03	1.12E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.35E-04	2.54E-04	1.75E-04	1.34E-04	1.19E-04	1.99E-04	4.36E-04	1.03E-03	1.92E-03	1.71E-03	1.59E-03	1.45E-03	1.05E-03	9.48E-04	1.06E-03	1.15E-03	1.17E-03	1.35E-03	1.55E-03	1.34E-03	1.02E-03	7.50E-04	6.70E-04	5.60E-04
	Emission in each Box of 1st jet	g/s	9.56E-05	7.26E-05	5.01E-05	3.82E-05	3.39E-05	5.69E-05	1.25E-04	2.94E-04	5.48E-04	4.87E-04	4.53E-04	4.15E-04	3.01E-04	2.71E-04	3.01E-04	3.29E-04	3.34E-04	3.84E-04	4.43E-04	3.82E-04	2.92E-04	2.14E-04	1.92E-04	1.60E-04
	Emission in each Box of 2nd jet	g/s	5.58E-05	4.24E-05	2.92E-05	2.23E-05	1.98E-05	3.32E-05	7.27E-05	1.71E-04	3.20E-04	2.84E-04	2.64E-04	2.42E-04	1.75E-04	1.58E-04	1.76E-04	1.92E-04	1.95E-04	2.24E-04	2.58E-04	2.23E-04	1.70E-04	1.25E-04	1.12E-04	9.34E-05
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2021	0.1678	0.1687	0.1760	0.1813	0.3481	0.3702	0.3217	0.3455	0.3182	0.3095	0.3063	0.2947	0.2793	0.2936	0.3039	0.3033	0.3202	0.3472	0.3160	0.2912	0.2676	0.2591	0.2442
	NO2	g/vehicle/km	0.0368	0.0352	0.0347	0.0356	0.0362	0.0452	0.0461	0.0496	0.0633	0.0581	0.0564	0.0551	0.0586	0.0552	0.0585	0.0605	0.0600	0.0640	0.0703	0.0643	0.0577	0.0514	0.0493	0.0472
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0062***	***0.0041***	***0.0029***	***0.0022***	***0.0019***	***0.0051***	***0.0116***	***0.0228***	***0.0354***	***0.0316***	***0.0283***	***0.0269***	***0.0177***	***0.0157***	***0.0175***	***0.0190***	***0.0196***	***0.0223***	***0.0256***	***0.0223***	***0.0170***	***0.0129***	***0.0117***	***0.0096***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.12E-03	2.73E-03	1.91E-03	1.49E-03	1.30E-03	3.37E-03	7.72E-03	1.52E-02	2.36E-02	2.10E-02	1.89E-02	1.79E-02	1.18E-02	1.05E-02	1.17E-02	1.27E-02	1.31E-02	1.49E-02	1.70E-02	1.48E-02	1.13E-02	8.62E-03	7.78E-03	6.38E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.06E-03	1.36E-03	9.57E-04	7.47E-04	6.49E-04	1.68E-03	3.86E-03	7.60E-03	1.18E-02	1.05E-02	9.44E-03	8.97E-03	5.90E-03	5.24E-03	5.83E-03	6.33E-03	6.54E-03	7.45E-03	8.52E-03	7.42E-03	5.66E-03	4.31E-03	3.89E-03	3.19E-03
	Emission in each Box of 1st jet	g/s	5.89E-04	3.90E-04	2.73E-04	2.13E-04	1.86E-04	4.81E-04	1.10E-03	2.17E-03	3.37E-03	3.01E-03	2.70E-03	2.56E-03	1.69E-03	1.50E-03	1.67E-03	1.81E-03	1.87E-03	2.13E-03	2.43E-03	2.12E-03	1.62E-03	1.23E-03	1.11E-03	9.12E-04
	Emission in each Box of 2nd jet	g/s	3.43E-04	2.27E-04	1.59E-04	1.24E-04	1.08E-04	2.81E-04	6.43E-04	1.27E-03	1.96E-03	1.75E-03	1.57E-03	1.50E-03	9.83E-04	8.73E-04	9.72E-04	1.06E-03	1.09E-03	1.24E-03	1.42E-03	1.24E-03	9.43E-04	7.18E-04	6.48E-04	5.32E-04
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0007***	***0.0014***	***0.0035***	***0.0065***	***0.0058***	***0.0052***	***0.0048***	***0.0035***	***0.0031***	***0.0035***	***0.0038***	***0.0039***	***0.0045***	***0.0052***	***0.0045***	***0.0034***	***0.0025***	***0.0022***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.50E-04	5.73E-04	3.94E-04	3.02E-04	2.59E-04	4.38E-04	9.62E-04	2.34E-03	4.32E-03	3.84E-03	3.44E-03	3.23E-03	2.35E-03	2.07E-03	2.32E-03	2.52E-03	2.59E-03	2.98E-03	3.45E-03	3.02E-03	2.24E-03	1.65E-03	1.48E-03	1.23E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.75E-04	2.86E-04	1.97E-04	1.51E-04	1.30E-04	2.19E-04	4.81E-04	1.17E-03	2.16E-03	1.92E-03	1.72E-03	1.61E-03	1.17E-03	1.04E-03	1.16E-03	1.26E-03	1.30E-03	1.49E-03	1.72E-03	1.51E-03	1.12E-03	8.27E-04	7.40E-04	6.16E-04
	Emission in each Box of 1st jet	g/s	1.07E-04	8.18E-05	5.62E-05	4.31E-05	3.71E-05	6.26E-05	1.37E-04	3.35E-04	6.17E-04	5.49E-04	4.92E-04	4.61E-04	3.35E-04	2.96E-04	3.32E-04	3.60E-04	3.70E-04	4.25E-04	4.93E-04	4.31E-04	3.20E-04	2.36E-04	2.12E-04	1.76E-04
	Emission in each Box of 2nd jet	g/s	6.25E-05	4.77E-05	3.28E-05	2.51E-05	2.16E-05	3.65E-05	8.02E-05	1.95E-04	3.60E-04	3.20E-04	2.87E-04	2.69E-04	1.96E-04	1.73E-04	1.93E-04	2.10E-04	2.16E-04	2.48E-04	2.87E-04	2.51E-04	1.87E-04	1.38E-04	1.23E-04	1.03E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2216	0.1864	0.1877	0.1979	0.2047	0.3922	0.4163	0.3608	0.3886	0.3592	0.3494	0.3436	0.3260	0.3090	0.3249	0.3365	0.3341	0.3588	0.3814	0.3522	0.3229	0.2968	0.2877	0.2723
	NO2	g/vehicle/km	0.0401	0.0388	0.0383	0.0396	0.0405	0.0507	0.0516	0.0553	0.0709	0.0652	0.0633	0.0615	0.0646	0.0609	0.0644	0.0668	0.0658	0.0713	0.0768	0.0712	0.0636	0.0567	0.0544	0.0523
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0068***	***0.0045***	***0.0032***	***0.0025***	***0.0022***	***0.0057***	***0.0130***	***0.0256***	***0.0398***	***0.0356***	***0.0320***	***0.0302***	***0.0196***	***0.0174***	***0.0193***	***0.0210***	***0.0216***	***0.0250***	***0.0281***	***0.0248***	***0.0188***	***0.0143***	***0.0130***	***0.0107***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.52E-03	3.03E-03	2.13E-03	1.68E-03	1.47E-03	3.80E-03	8.68E-03	1.70E-02	2.65E-02	2.37E-02	2.13E-02	2.01E-02	1.31E-02	1.16E-02	1.29E-02	1.40E-02	1.44E-02	1.67E-02	1.87E-02	1.65E-02	1.25E-02	9.56E-03	8.64E-03	7.12E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.26E-03	1.51E-03	1.06E-03	8.40E-04	7.33E-04	1.90E-03	4.34E-03	8.52E-03	1.33E-02	1.19E-02	1.07E-02	1.01E-02	6.53E-03	5.79E-03	6.45E-03	7.01E-03	7.21E-03	8.35E-03	9.36E-03	8.27E-03	6.27E-03	4.78E-03	4.32E-03	3.56E-03
	Emission in each Box of 1st jet	g/s	6.45E-04	4.33E-04	3.04E-04	2.40E-04	2.09E-04	5.42E-04	1.24E-03	2.44E-03	3.79E-03	3.39E-03	3.05E-03	2.88E-03	1.86E-03	1.65E-03	1.84E-03	2.00E-03	2.06E-03	2.38E-03	2.67E-03	2.36E-03	1.79E-03	1.37E-03	1.23E-03	1.02E-03
	Emission in each Box of 2nd jet	g/s	3.76E-04	2.52E-04	1.77E-04	1.40E-04	1.22E-04	3.16E-04	7.23E-04	1.42E-03	2.21E-03	1.98E-03	1.78E-03	1.68E-03	1.09E-03	9.65E-04	1.07E-03	1.17E-03	1.20E-03	1.39E-03	1.56E-03	1.38E-03	1.05E-03	7.96E-04	7.20E-04	5.93E-04
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0007***	***0.0016***	***0.0039***	***0.0073***	***0.0065***	***0.0058***	***0.0054***	***0.0039***	***0.0034***	***0.0038***	***0.0042***	***0.0043***	***0.0050***	***0.0057***	***0.0050***	***0.0037***	***0.0027***	***0.0025***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.17E-04	6.31E-04	4.34E-04	3.36E-04	2.90E-04	4.90E-04	1.08E-03	2.61E-03	4.84E-03	4.31E-03	3.86E-03	3.60E-03	2.59E-03	2.28E-03	2.56E-03	2.78E-03	2.84E-03	3.32E-03	3.77E-03	3.34E-03	2.47E-03	1.82E-03	1.63E-03	1.37E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.09E-04	3.15E-04	2.17E-04	1.68E-04	1.45E-04	2.45E-04	5.38E-04	1.31E-03	2.42E-03	2.15E-03	1.93E-03	1.80E-03	1.29E-03	1.14E-03	1.28E-03	1.39E-03	1.42E-03	1.66E-03	1.89E-03	1.67E-03	1.24E-03	9.12E-04	8.17E-04	6.83E-04
	Emission in each Box of 1st jet	g/s	1.17E-04	9.01E-05	6.21E-05	4.80E-05	4.14E-05	7.01E-05	1.54E-04	3.73E-04	6.91E-04	6.16E-04	5.52E-04	5.15E-04	3.70E-04	3.26E-04	3.65E-04	3.97E-04	4.06E-04	4.74E-04	5.39E-04	4.78E-04	3.53E-04	2.61E-04	2.34E-04	1.95E-04
	Emission in each Box of 2nd jet	g/s	6.81E-05	5.26E-05	3.62E-05	2.80E-05	2.42E-05	4.09E-05	8.97E-05	2.18E-04	4.03E-04	3.59E-04	3.22E-04	3.00E-04	2.16E-04	1.90E-04	2.13E-04	2.32E-04	2.37E-04	2.76E-04	3.14E-04	2.79E-04	2.06E-04	1.52E-04	1.36E-04	1.14E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	085C01-085C13
Enclosure Involved	085P3
Road Located	088
Vehicle EF Adopted	085

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	478	381	266	199	168	227	489	1108	1600	1550	1431	1374	939	879	931	977	1012	1091	1151	1101	911	755	704	613
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2337	0.1953	0.1968	0.2062	0.2158	0.4105	0.4344	0.3762	0.4049	0.3738	0.3626	0.3573	0.3382	0.3206	0.3381	0.3494	0.3466	0.3713	0.3985	0.3636	0.3345	0.3068	0.3012	0.2851
	NO2	g/vehicle/km	0.0420	0.0403	0.0398	0.0409	0.0423	0.0528	0.0536	0.0574	0.0735	0.0676	0.0656	0.0638	0.0669	0.0630	0.0669	0.0692	0.0681	0.0736	0.0800	0.0733	0.0656	0.0584	0.0567	0.0544
	RSP	g/vehicle/km	0.0136	0.0109	0.0110	0.0116	0.0121	0.0251	0.0267	0.0210	0.0198	0.0187	0.0187	0.0185	0.0172	0.0170	0.0171	0.0176	0.0174	0.0182	0.0189	0.0177	0.0169	0.0166	0.0164	0.0156
	FSP	g/vehicle/km	0.0125	0.0100	0.0101	0.0107	0.0111	0.0231	0.0246	0.0194	0.0183	0.0172	0.0172	0.0170	0.0158	0.0156	0.0157	0.0162	0.0160	0.0167	0.0175	0.0162	0.0156	0.0153	0.0151	0.0143
Parameters of the Enclosure	Width of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28	230.28
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NO Emission Rate		g/s	***0.0071***	***0.0048***	***0.0033***	***0.0026***	***0.0023***	***0.0060***	***0.0136***	***0.0267***	***0.0414***	***0.0371***	***0.0332***	***0.0314***	***0.0203***	***0.0180***	***0.0201***	***0.0218***	***0.0224***	***0.0259***	***0.0293***	***0.0256***	***0.0195***	***0.0148***	***0.0136***	***0.0112***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.76E-03	3.17E-03	2.23E-03	1.75E-03	1.55E-03	3.97E-03	9.06E-03	1.78E-02	2.76E-02	2.47E-02	2.21E-02	2.09E-02	1.35E-02	1.20E-02	1.34E-02	1.46E-02	1.50E-02	1.73E-02	1.96E-02	1.71E-02	1.30E-02	9.88E-03	9.04E-03	7.45E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.38E-03	1.59E-03	1.12E-03	8.75E-04	7.73E-04	1.99E-03	4.53E-03	8.89E-03	1.38E-02	1.24E-02	1.11E-02	1.05E-02	6.77E-03	6.01E-03	6.71E-03	7.28E-03	7.48E-03	8.64E-03	9.78E-03	8.53E-03	6.50E-03	4.94E-03	4.52E-03	3.73E-03
	Emission in each Box of 1st jet	g/s	6.80E-04	4.53E-04	3.19E-04	2.50E-04	2.21E-04	5.68E-04	1.29E-03	2.54E-03	3.95E-03	3.53E-03	3.16E-03	2.99E-03	1.93E-03	1.72E-03	1.92E-03	2.08E-03	2.14E-03	2.47E-03	2.79E-03	2.44E-03	1.86E-03	1.41E-03	1.29E-03	1.06E-03
	Emission in each Box of 2nd jet	g/s	3.97E-04	2.64E-04	1.86E-04	1.46E-04	1.29E-04	3.31E-04	7.55E-04	1.48E-03	2.30E-03	2.06E-03	1.84E-03	1.74E-03	1.13E-03	1.00E-03	1.12E-03	1.21E-03	1.25E-03	1.44E-03	1.63E-03	1.42E-03	1.08E-03	8.23E-04	7.53E-04	6.21E-04
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0017***	***0.0041***	***0.0075***	***0.0067***	***0.0060***	***0.0056***	***0.0040***	***0.0035***	***0.0040***	***0.0043***	***0.0044***	***0.0051***	***0.0059***	***0.0052***	***0.0038***	***0.0028***	***0.0026***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.57E-04	6.55E-04	4.52E-04	3.47E-04	3.03E-04	5.11E-04	1.12E-03	2.71E-03	5.02E-03	4.47E-03	4.00E-03	3.74E-03	2.68E-03	2.36E-03	2.65E-03	2.88E-03	2.94E-03	3.42E-03	3.93E-03	3.44E-03	2.55E-03	1.88E-03	1.70E-03	1.42E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.28E-04	3.28E-04	2.26E-04	1.74E-04	1.51E-04	2.55E-04	5.59E-04	1.36E-03	2.51E-03	2.23E-03	2.00E-03	1.87E-03	1.34E-03	1.18E-03	1.33E-03	1.44E-03	1.47E-03	1.71E-03	1.96E-03	1.72E-03	1.27E-03	9.40E-04	8.52E-04	7.12E-04
	Emission in each Box of 1st jet	g/s	1.22E-04	9.36E-05	6.45E-05	4.96E-05	4.33E-05	7.30E-05	1.60E-04	3.87E-04	7.17E-04	6.38E-04	5.72E-04	5.34E-04	3.82E-04	3.38E-04	3.79E-04	4.12E-04	4.20E-04	4.89E-04	5.61E-04	4.92E-04	3.64E-04	2.69E-04	2.43E-04	2.03E-04
	Emission in each Box of 2nd jet	g/s	7.14E-05	5.46E-05	3.76E-05	2.89E-05	2.52E-05	4.26E-05	9.32E-05	2.26E-04	4.18E-04	3.72E-04	3.33E-04	3.11E-04	2.23E-04	1.97E-04	2.21E-04	2.40E-04	2.45E-04	2.85E-04	3.27E-04	2.87E-04	2.12E-04	1.57E-04	1.42E-04	1.19E-04
RSP Emission Rate		g/s	***4.15E-04***	***2.65E-04***	***1.87E-04***	***1.48E-04***	***1.30E-04***	***3.65E-04***	***8.35E-04***	***1.49E-03***	***2.03E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***1.03E-03***	***9.54E-04***	***1.02E-03***	***1.10E-03***	***1.13E-03***	***1.27E-03***	***1.39E-03***	***1.24E-03***	***9.86E-04***	***8.04E-04***	***7.36E-04***	***6.10E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.76E-04	1.77E-04	1.25E-04	9.87E-05	8.69E-05	2.43E-04	5.57E-04	9.94E-04	1.35E-03	1.24E-03	1.14E-03	1.09E-03	6.88E-04	6.36E-04	6.79E-04	7.34E-04	7.51E-04	8.49E-04	9.30E-04	8.30E-04	6.57E-04	5.36E-04	4.91E-04	4.07E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.38E-04	8.84E-05	6.23E-05	4.93E-05	4.34E-05	1.22E-04	2.78E-04	4.97E-04	6.76E-04	6.19E-04	5.70E-04	5.43E-04	3.44E-04	3.18E-04	3.40E-04	3.67E-04	3.76E-04	4.24E-04	4.65E-04	4.15E-04	3.29E-04	2.68E-04	2.45E-04	2.03E-04
	Emission in each Box of 1st jet	g/s	3.95E-05	2.53E-05	1.78E-05	1.41E-05	1.24E-05	3.47E-05	7.96E-05	1.42E-04	1.93E-04	1.77E-04	1.63E-04	1.55E-04	9.83E-05	9.09E-05	9.71E-05	1.05E-04	1.07E-04	1.21E-04	1.33E-04	1.19E-04	9.39E-05	7.66E-05	7.01E-05	5.81E-05
	Emission in each Box of 2nd jet	g/s	2.30E-05	1.47E-05	1.04E-05	8.22E-06	7.24E-06	2.03E-05	4.64E-05	8.29E-05	1.13E-04	1.03E-04	9.50E-05	9.05E-05	5.73E-05	5.30E-05	5.66E-05	6.11E-05	6.26E-05	7.07E-05	7.75E-05	6.91E-05	5.48E-05	4.47E-05	4.09E-05	3.39E-05
FSP Emission Rate		g/s	***3.81E-04***	***2.44E-04***	***1.72E-04***	***1.36E-04***	***1.20E-04***	***3.35E-04***	***7.68E-04***	***1.37E-03***	***1.87E-03***	***1.70E-03***	***1.57E-03***	***1.50E-03***	***9.49E-04***	***8.77E-04***	***9.37E-04***	***1.01E-03***	***1.04E-03***	***1.17E-03***	***1.28E-03***	***1.14E-03***	***9.07E-04***	***7.41E-04***	***6.78E-04***	***5.62E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.54E-04	1.63E-04	1.15E-04	9.07E-05	7.99E-05	2.24E-04	5.12E-04	9.16E-04	1.25E-03	1.14E-03	1.05E-03	9.99E-04	6.33E-04	5.85E-04	6.25E-04	6.74E-04	6.90E-04	7.78E-04	8.57E-04	7.61E-04	6.05E-04	4.94E-04	4.52E-04	3.74E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.27E-04	8.13E-05	5.73E-05	4.54E-05	3.99E-05	1.12E-04	2.56E-04	4.58E-04	6.23E-04	5.68E-04	5.25E-04	4.99E-04	3.16E-04	2.92E-04	3.12E-04	3.37E-04	3.45E-04	3.89E-04	4.28E-04	3.80E-04	3.02E-04	2.47E-04	2.26E-04	1.87E-04
	Emission in each Box of 1st jet	g/s	3.63E-05	2.32E-05	1.64E-05	1.30E-05	1.14E-05	3.19E-05	7.32E-05	1.31E-04	1.78E-04	1.62E-04	1.50E-04	1.43E-04	9.04E-05	8.36E-05	8.93E-05	9.64E-05	9.86E-05	1.11E-04	1.22E-04	1.09E-04	8.64E-05	7.06E-05	6.46E-05	5.35E-05
	Emission in each Box of 2nd jet	g/s	2.12E-05	1.36E-05	9.55E-06	7.56E-06	6.65E-06	1.86E-05	4.27E-05	7.63E-05	1.04E-04	9.46E-05	8.74E-05	8.32E-05	5.27E-05	4.87E-05	5.21E-05	5.62E-05	5.75E-05	6.49E-05	7.14E-05	6.34E-05	5.04E-05	4.12E-05	3.77E-05	3.12E-05
Initial Lateral Dimension		σy	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2331	0.2050	0.2067	0.2186	0.2224	0.3657	0.3857	0.3501	0.3885	0.3722	0.3515	0.3533	0.3428	0.3375	0.3394	0.3414	0.3567	0.3674	0.3749	0.3649	0.3336	0.3264	0.3204	0.3000
	NO2	g/vehicle/km	0.0448	0.0436	0.0439	0.0443	0.0447	0.0522	0.0538	0.0595	0.0756	0.0726	0.0684	0.0685	0.0594	0.0578	0.0588	0.0590	0.0609	0.0629	0.0650	0.0646	0.0571	0.0530	0.0516	0.0491
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0059***	***0.0042***	***0.0029***	***0.0023***	***0.0019***	***0.0038***	***0.0085***	***0.0195***	***0.0325***	***0.0302***	***0.0262***	***0.0252***	***0.0220***	***0.0203***	***0.0217***	***0.0229***	***0.0248***	***0.0276***	***0.0297***	***0.0277***	***0.0209***	***0.0168***	***0.0154***	***0.0127***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.93E-03	2.81E-03	1.95E-03	1.53E-03	1.29E-03	2.53E-03	5.69E-03	1.30E-02	2.17E-02	2.01E-02	1.75E-02	1.68E-02	1.47E-02	1.36E-02	1.44E-02	1.52E-02	1.66E-02	1.84E-02	1.98E-02	1.85E-02	1.39E-02	1.12E-02	1.03E-02	8.45E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.97E-03	1.40E-03	9.75E-04	7.66E-04	6.46E-04	1.26E-03	2.85E-03	6.50E-03	1.08E-02	1.01E-02	8.74E-03	8.41E-03	7.34E-03	6.78E-03	7.22E-03	7.62E-03	8.28E-03	9.18E-03	9.90E-03	9.25E-03	6.96E-03	5.61E-03	5.14E-03	4.22E-03
	Emission in each Box of 1st jet	g/s	5.62E-04	4.01E-04	2.79E-04	2.19E-04	1.85E-04	3.61E-04	8.13E-04	1.86E-03	3.10E-03	2.88E-03	2.50E-03	2.40E-03	2.10E-03	1.94E-03	2.06E-03	2.18E-03	2.37E-03	2.62E-03	2.83E-03	2.64E-03	1.99E-03	1.60E-03	1.47E-03	1.21E-03
	Emission in each Box of 2nd jet	g/s	9.83E-04	7.02E-04	4.87E-04	3.83E-04	3.23E-04	6.32E-04	1.42E-03	3.25E-03	5.42E-03	5.04E-03	4.37E-03	4.21E-03	3.67E-03	3.39E-03	3.61E-03	3.81E-03	4.14E-03	4.59E-03	4.95E-03	4.62E-03	3.48E-03	2.80E-03	2.57E-03	2.11E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0005***	***0.0012***	***0.0033***	***0.0063***	***0.0059***	***0.0051***	***0.0049***	***0.0038***	***0.0035***	***0.0038***	***0.0040***	***0.0042***	***0.0047***	***0.0052***	***0.0049***	***0.0036***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.56E-04	5.97E-04	4.14E-04	3.11E-04	2.60E-04	3.61E-04	7.94E-04	2.21E-03	4.22E-03	3.93E-03	3.40E-03	3.26E-03	2.55E-03	2.32E-03	2.50E-03	2.63E-03	2.83E-03	3.14E-03	3.44E-03	3.27E-03	2.38E-03	1.82E-03	1.65E-03	1.38E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.78E-04	2.99E-04	2.07E-04	1.55E-04	1.30E-04	1.80E-04	3.97E-04	1.10E-03	2.11E-03	1.96E-03	1.70E-03	1.63E-03	1.27E-03	1.16E-03	1.25E-03	1.32E-03	1.41E-03	1.57E-03	1.72E-03	1.64E-03	1.19E-03	9.11E-04	8.27E-04	6.91E-04
	Emission in each Box of 1st jet	g/s	1.08E-04	8.53E-05	5.92E-05	4.44E-05	3.71E-05	5.15E-05	1.13E-04	3.15E-04	6.03E-04	5.61E-04	4.86E-04	4.66E-04	3.64E-04	3.32E-04	3.57E-04	3.76E-04	4.04E-04	4.49E-04	4.91E-04	4.68E-04	3.40E-04	2.60E-04	2.36E-04	1.98E-04
	Emission in each Box of 2nd jet	g/s	1.89E-04	1.49E-04	1.04E-04	7.77E-05	6.50E-05	9.02E-05	1.98E-04	5.52E-04	1.05E-03	9.82E-04	8.50E-04	8.15E-04	6.36E-04	5.80E-04	6.25E-04	6.58E-04	7.07E-04	7.86E-04	8.59E-04	8.18E-04	5.96E-04	4.55E-04	4.13E-04	3.46E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2181	0.1900	0.1910	0.2044	0.2076	0.3420	0.3574	0.3277	0.3605	0.3411	0.3243	0.3260	0.3160	0.3135	0.3178	0.3169	0.3307	0.3425	0.3490	0.3422	0.3124	0.3064	0.2975	0.2782
	NO2	g/vehicle/km	0.0422	0.0408	0.0410	0.0418	0.0421	0.0491	0.0501	0.0559	0.0706	0.0670	0.0635	0.0635	0.0551	0.0540	0.0553	0.0551	0.0569	0.0590	0.0609	0.0609	0.0539	0.0501	0.0483	0.0459
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0055***	***0.0039***	***0.0027***	***0.0021***	***0.0018***	***0.0035***	***0.0079***	***0.0182***	***0.0302***	***0.0277***	***0.0242***	***0.0233***	***0.0203***	***0.0189***	***0.0203***	***0.0212***	***0.0230***	***0.0257***	***0.0277***	***0.0260***	***0.0196***	***0.0158***	***0.0143***	***0.0118***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.68E-03	2.60E-03	1.80E-03	1.43E-03	1.21E-03	2.36E-03	5.27E-03	1.22E-02	2.01E-02	1.85E-02	1.61E-02	1.55E-02	1.35E-02	1.26E-02	1.35E-02	1.41E-02	1.54E-02	1.71E-02	1.84E-02	1.73E-02	1.30E-02	1.05E-02	9.54E-03	7.84E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.84E-03	1.30E-03	9.01E-04	7.16E-04	6.03E-04	1.18E-03	2.64E-03	6.08E-03	1.01E-02	9.23E-03	8.07E-03	7.76E-03	6.77E-03	6.30E-03	6.76E-03	7.07E-03	7.68E-03	8.56E-03	9.22E-03	8.67E-03	6.52E-03	5.27E-03	4.77E-03	3.92E-03
	Emission in each Box of 1st jet	g/s	5.26E-04	3.72E-04	2.57E-04	2.05E-04	1.72E-04	3.38E-04	7.53E-04	1.74E-03	2.87E-03	2.64E-03	2.30E-03	2.22E-03	1.93E-03	1.80E-03	1.93E-03	2.02E-03	2.19E-03	2.45E-03	2.63E-03	2.48E-03	1.86E-03	1.50E-03	1.36E-03	1.12E-03
	Emission in each Box of 2nd jet	g/s	9.20E-04	6.51E-04	4.50E-04	3.58E-04	3.02E-04	5.91E-04	1.32E-03	3.04E-03	5.03E-03	4.62E-03	4.03E-03	3.88E-03	3.38E-03	3.15E-03	3.38E-03	3.54E-03	3.84E-03	4.28E-03	4.61E-03	4.34E-03	3.26E-03	2.63E-03	2.38E-03	1.96E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0031***	***0.0059***	***0.0054***	***0.0047***	***0.0045***	***0.0035***	***0.0033***	***0.0035***	***0.0037***	***0.0040***	***0.0044***	***0.0048***	***0.0046***	***0.0034***	***0.0026***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.12E-04	5.59E-04	3.87E-04	2.93E-04	2.45E-04	3.39E-04	7.40E-04	2.08E-03	3.94E-03	3.63E-03	3.16E-03	3.02E-03	2.36E-03	2.17E-03	2.35E-03	2.46E-03	2.64E-03	2.95E-03	3.22E-03	3.09E-03	2.25E-03	1.72E-03	1.55E-03	1.29E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.56E-04	2.79E-04	1.93E-04	1.46E-04	1.22E-04	1.70E-04	3.70E-04	1.04E-03	1.97E-03	1.81E-03	1.58E-03	1.51E-03	1.18E-03	1.09E-03	1.18E-03	1.23E-03	1.32E-03	1.47E-03	1.61E-03	1.54E-03	1.12E-03	8.60E-04	7.74E-04	6.46E-04
	Emission in each Box of 1st jet	g/s	1.02E-04	7.98E-05	5.53E-05	4.18E-05	3.49E-05	4.84E-05	1.06E-04	2.97E-04	5.63E-04	5.18E-04	4.51E-04	4.32E-04	3.38E-04	3.10E-04	3.36E-04	3.51E-04	3.77E-04	4.21E-04	4.60E-04	4.41E-04	3.21E-04	2.46E-04	2.21E-04	1.84E-04
	Emission in each Box of 2nd jet	g/s	1.78E-04	1.40E-04	9.67E-05	7.32E-05	6.11E-05	8.48E-05	1.85E-04	5.19E-04	9.85E-04	9.07E-04	7.89E-04	7.56E-04	5.91E-04	5.43E-04	5.88E-04	6.15E-04	6.60E-04	7.37E-04	8.05E-04	7.72E-04	5.62E-04	4.30E-04	3.87E-04	3.23E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2058	0.1795	0.1809	0.1908	0.1938	0.3205	0.3357	0.3084	0.3402	0.3249	0.3054	0.3111	0.3015	0.2945	0.2986	0.3012	0.3112	0.3240	0.3325	0.3231	0.2938	0.2881	0.2796	0.2621
	NO2	g/vehicle/km	0.0401	0.0388	0.0391	0.0394	0.0396	0.0463	0.0474	0.0530	0.0669	0.0640	0.0599	0.0608	0.0527	0.0509	0.0522	0.0525	0.0537	0.0559	0.0583	0.0578	0.0509	0.0473	0.0456	0.0434
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0052***	***0.0037***	***0.0026***	***0.0020***	***0.0017***	***0.0033***	***0.0074***	***0.0172***	***0.0285***	***0.0264***	***0.0228***	***0.0222***	***0.0194***	***0.0178***	***0.0191***	***0.0202***	***0.0217***	***0.0243***	***0.0263***	***0.0246***	***0.0184***	***0.0149***	***0.0134***	***0.0111***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.47E-03	2.46E-03	1.71E-03	1.34E-03	1.13E-03	2.21E-03	4.95E-03	1.14E-02	1.90E-02	1.76E-02	1.52E-02	1.48E-02	1.29E-02	1.18E-02	1.27E-02	1.34E-02	1.44E-02	1.62E-02	1.76E-02	1.64E-02	1.23E-02	9.90E-03	8.96E-03	7.38E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.74E-03	1.23E-03	8.53E-04	6.68E-04	5.63E-04	1.11E-03	2.48E-03	5.72E-03	9.49E-03	8.79E-03	7.60E-03	7.41E-03	6.46E-03	5.92E-03	6.35E-03	6.72E-03	7.22E-03	8.10E-03	8.78E-03	8.19E-03	6.13E-03	4.95E-03	4.48E-03	3.69E-03
	Emission in each Box of 1st jet	g/s	4.96E-04	3.51E-04	2.44E-04	1.91E-04	1.61E-04	3.16E-04	7.08E-04	1.63E-03	2.71E-03	2.51E-03	2.17E-03	2.12E-03	1.85E-03	1.69E-03	1.81E-03	1.92E-03	2.06E-03	2.31E-03	2.51E-03	2.34E-03	1.75E-03	1.41E-03	1.28E-03	1.05E-03
	Emission in each Box of 2nd jet	g/s	8.68E-04	6.15E-04	4.27E-04	3.34E-04	2.82E-04	5.54E-04	1.24E-03	2.86E-03	4.74E-03	4.40E-03	3.80E-03	3.70E-03	3.23E-03	2.96E-03	3.18E-03	3.36E-03	3.61E-03	4.05E-03	4.39E-03	4.09E-03	3.06E-03	2.48E-03	2.24E-03	1.85E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0029***	***0.0056***	***0.0052***	***0.0045***	***0.0043***	***0.0034***	***0.0031***	***0.0033***	***0.0035***	***0.0037***	***0.0042***	***0.0046***	***0.0044***	***0.0032***	***0.0024***	***0.0022***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.76E-04	5.32E-04	3.69E-04	2.76E-04	2.30E-04	3.20E-04	6.99E-04	1.97E-03	3.73E-03	3.46E-03	2.98E-03	2.89E-03	2.26E-03	2.05E-03	2.22E-03	2.34E-03	2.49E-03	2.80E-03	3.08E-03	2.93E-03	2.12E-03	1.63E-03	1.46E-03	1.22E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.38E-04	2.66E-04	1.84E-04	1.38E-04	1.15E-04	1.60E-04	3.49E-04	9.83E-04	1.87E-03	1.73E-03	1.49E-03	1.45E-03	1.13E-03	1.02E-03	1.11E-03	1.17E-03	1.25E-03	1.40E-03	1.54E-03	1.46E-03	1.06E-03	8.13E-04	7.31E-04	6.11E-04
	Emission in each Box of 1st jet	g/s	9.66E-05	7.59E-05	5.27E-05	3.94E-05	3.29E-05	4.57E-05	9.98E-05	2.81E-04	5.33E-04	4.95E-04	4.26E-04	4.14E-04	3.23E-04	2.92E-04	3.17E-04	3.35E-04	3.56E-04	4.00E-04	4.40E-04	4.19E-04	3.03E-04	2.32E-04	2.09E-04	1.75E-04
	Emission in each Box of 2nd jet	g/s	1.69E-04	1.33E-04	9.22E-05	6.89E-05	5.76E-05	7.99E-05	1.75E-04	4.91E-04	9.34E-04	8.66E-04	7.45E-04	7.24E-04	5.65E-04	5.11E-04	5.55E-04	5.86E-04	6.23E-04	6.99E-04	7.70E-04	7.32E-04	5.31E-04	4.07E-04	3.65E-04	3.06E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1934	0.1685	0.1691	0.1826	0.1855	0.3083	0.3231	0.2940	0.3243	0.3099	0.2909	0.2959	0.2865	0.2846	0.2885	0.2860	0.3016	0.3082	0.3165	0.3061	0.2788	0.2779	0.2685	0.2507
	NO2	g/vehicle/km	0.0379	0.0367	0.0368	0.0379	0.0381	0.0446	0.0457	0.0506	0.0640	0.0612	0.0573	0.0579	0.0503	0.0493	0.0505	0.0500	0.0522	0.0534	0.0556	0.0549	0.0485	0.0457	0.0439	0.0417
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0049***	***0.0035***	***0.0024***	***0.0019***	***0.0016***	***0.0032***	***0.0072***	***0.0164***	***0.0271***	***0.0252***	***0.0217***	***0.0211***	***0.0184***	***0.0172***	***0.0184***	***0.0192***	***0.0210***	***0.0231***	***0.0251***	***0.0233***	***0.0174***	***0.0143***	***0.0129***	***0.0106***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.26E-03	2.31E-03	1.60E-03	1.28E-03	1.08E-03	2.13E-03	4.77E-03	1.09E-02	1.81E-02	1.68E-02	1.45E-02	1.41E-02	1.23E-02	1.14E-02	1.23E-02	1.28E-02	1.40E-02	1.54E-02	1.67E-02	1.55E-02	1.16E-02	9.55E-03	8.61E-03	7.06E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.63E-03	1.15E-03	7.98E-04	6.40E-04	5.39E-04	1.07E-03	2.38E-03	5.45E-03	9.04E-03	8.38E-03	7.24E-03	7.04E-03	6.14E-03	5.72E-03	6.14E-03	6.38E-03	7.00E-03	7.71E-03	8.36E-03	7.76E-03	5.82E-03	4.78E-03	4.30E-03	3.53E-03
	Emission in each Box of 1st jet	g/s	4.66E-04	3.30E-04	2.28E-04	1.83E-04	1.54E-04	3.04E-04	6.81E-04	1.56E-03	2.58E-03	2.40E-03	2.07E-03	2.01E-03	1.75E-03	1.63E-03	1.75E-03	1.82E-03	2.00E-03	2.20E-03	2.39E-03	2.22E-03	1.66E-03	1.36E-03	1.23E-03	1.01E-03
	Emission in each Box of 2nd jet	g/s	8.16E-04	5.77E-04	3.99E-04	3.20E-04	2.70E-04	5.33E-04	1.19E-03	2.73E-03	4.52E-03	4.19E-03	3.62E-03	3.52E-03	3.07E-03	2.86E-03	3.07E-03	3.19E-03	3.50E-03	3.85E-03	4.18E-03	3.88E-03	2.91E-03	2.39E-03	2.15E-03	1.77E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0005***	***0.0010***	***0.0028***	***0.0054***	***0.0050***	***0.0043***	***0.0041***	***0.0032***	***0.0030***	***0.0032***	***0.0034***	***0.0036***	***0.0040***	***0.0044***	***0.0042***	***0.0030***	***0.0024***	***0.0021***	***0.0018***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.39E-04	5.02E-04	3.47E-04	2.65E-04	2.22E-04	3.08E-04	6.74E-04	1.88E-03	3.57E-03	3.31E-03	2.85E-03	2.76E-03	2.15E-03	1.98E-03	2.15E-03	2.23E-03	2.42E-03	2.67E-03	2.94E-03	2.78E-03	2.02E-03	1.57E-03	1.41E-03	1.17E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.20E-04	2.51E-04	1.74E-04	1.33E-04	1.11E-04	1.54E-04	3.37E-04	9.39E-04	1.78E-03	1.66E-03	1.42E-03	1.38E-03	1.08E-03	9.90E-04	1.07E-03	1.12E-03	1.21E-03	1.34E-03	1.47E-03	1.39E-03	1.01E-03	7.86E-04	7.03E-04	5.87E-04
	Emission in each Box of 1st jet	g/s	9.13E-05	7.18E-05	4.96E-05	3.79E-05	3.17E-05	4.41E-05	9.64E-05	2.68E-04	5.10E-04	4.73E-04	4.07E-04	3.94E-04	3.08E-04	2.83E-04	3.07E-04	3.19E-04	3.46E-04	3.82E-04	4.20E-04	3.98E-04	2.89E-04	2.24E-04	2.01E-04	1.68E-04
	Emission in each Box of 2nd jet	g/s	1.60E-04	1.26E-04	8.69E-05	6.63E-05	5.54E-05	7.71E-05	1.69E-04	4.69E-04	8.92E-04	8.28E-04	7.12E-04	6.90E-04	5.38E-04	4.95E-04	5.37E-04	5.58E-04	6.05E-04	6.68E-04	7.35E-04	6.96E-04	5.06E-04	3.93E-04	3.52E-04	2.93E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1740	0.1505	0.1516	0.1594	0.1620	0.2692	0.2788	0.2556	0.2859	0.2717	0.2594	0.2633	0.2565	0.2536	0.2589	0.2555	0.2686	0.2785	0.2790	0.2747	0.2497	0.2420	0.2357	0.2197
	NO2	g/vehicle/km	0.0343	0.0330	0.0333	0.0334	0.0336	0.0393	0.0397	0.0443	0.0567	0.0539	0.0513	0.0518	0.0452	0.0442	0.0455	0.0449	0.0467	0.0485	0.0493	0.0496	0.0437	0.0401	0.0388	0.0368
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0044***	***0.0031***	***0.0021***	***0.0017***	***0.0014***	***0.0028***	***0.0062***	***0.0142***	***0.0239***	***0.0221***	***0.0194***	***0.0188***	***0.0165***	***0.0153***	***0.0165***	***0.0171***	***0.0187***	***0.0209***	***0.0221***	***0.0209***	***0.0156***	***0.0125***	***0.0113***	***0.0093***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.93E-03	2.06E-03	1.43E-03	1.12E-03	9.42E-04	1.86E-03	4.11E-03	9.49E-03	1.59E-02	1.47E-02	1.29E-02	1.25E-02	1.10E-02	1.02E-02	1.10E-02	1.14E-02	1.25E-02	1.39E-02	1.47E-02	1.39E-02	1.04E-02	8.32E-03	7.55E-03	6.19E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.47E-03	1.03E-03	7.15E-04	5.59E-04	4.71E-04	9.30E-04	2.06E-03	4.74E-03	7.97E-03	7.35E-03	6.45E-03	6.27E-03	5.49E-03	5.09E-03	5.51E-03	5.70E-03	6.23E-03	6.96E-03	7.37E-03	6.96E-03	5.21E-03	4.16E-03	3.78E-03	3.09E-03
	Emission in each Box of 1st jet	g/s	4.19E-04	2.95E-04	2.04E-04	1.60E-04	1.35E-04	2.66E-04	5.88E-04	1.36E-03	2.28E-03	2.10E-03	1.84E-03	1.79E-03	1.57E-03	1.46E-03	1.57E-03	1.63E-03	1.78E-03	1.99E-03	2.11E-03	1.99E-03	1.49E-03	1.19E-03	1.08E-03	8.84E-04
	Emission in each Box of 2nd jet	g/s	7.34E-04	5.16E-04	3.57E-04	2.79E-04	2.35E-04	4.65E-04	1.03E-03	2.37E-03	3.99E-03	3.68E-03	3.23E-03	3.13E-03	2.75E-03	2.55E-03	2.75E-03	2.85E-03	3.12E-03	3.48E-03	3.68E-03	3.48E-03	2.60E-03	2.08E-03	1.89E-03	1.55E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0009***	***0.0025***	***0.0047***	***0.0044***	***0.0038***	***0.0037***	***0.0029***	***0.0027***	***0.0029***	***0.0030***	***0.0033***	***0.0036***	***0.0039***	***0.0038***	***0.0027***	***0.0021***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.79E-04	4.53E-04	3.14E-04	2.34E-04	1.95E-04	2.71E-04	5.86E-04	1.64E-03	3.16E-03	2.92E-03	2.55E-03	2.46E-03	1.94E-03	1.77E-03	1.94E-03	2.00E-03	2.17E-03	2.42E-03	2.61E-03	2.51E-03	1.82E-03	1.38E-03	1.24E-03	1.04E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.89E-04	2.26E-04	1.57E-04	1.17E-04	9.77E-05	1.36E-04	2.93E-04	8.22E-04	1.58E-03	1.46E-03	1.28E-03	1.23E-03	9.69E-04	8.87E-04	9.68E-04	1.00E-03	1.08E-03	1.21E-03	1.30E-03	1.26E-03	9.11E-04	6.90E-04	6.22E-04	5.18E-04
	Emission in each Box of 1st jet	g/s	8.27E-05	6.47E-05	4.49E-05	3.34E-05	2.79E-05	3.87E-05	8.37E-05	2.35E-04	4.52E-04	4.17E-04	3.64E-04	3.52E-04	2.77E-04	2.53E-04	2.77E-04	2.86E-04	3.10E-04	3.46E-04	3.72E-04	3.59E-04	2.60E-04	1.97E-04	1.78E-04	1.48E-04
	Emission in each Box of 2nd jet	g/s	1.45E-04	1.13E-04	7.85E-05	5.85E-05	4.89E-05	6.78E-05	1.46E-04	4.11E-04	7.90E-04	7.30E-04	6.38E-04	6.16E-04	4.84E-04	4.44E-04	4.84E-04	5.01E-04	5.42E-04	6.06E-04	6.51E-04	6.28E-04	4.55E-04	3.45E-04	3.11E-04	2.59E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1680	0.1461	0.1508	0.1586	0.1602	0.2663	0.2723	0.2525	0.2797	0.2712	0.2513	0.2550	0.2467	0.2455	0.2473	0.2474	0.2643	0.2719	0.2739	0.2716	0.2468	0.2406	0.2329	0.2183
	NO2	g/vehicle/km	0.0331	0.0321	0.0331	0.0332	0.0333	0.0389	0.0389	0.0438	0.0556	0.0539	0.0498	0.0502	0.0436	0.0428	0.0436	0.0436	0.0460	0.0474	0.0485	0.0490	0.0432	0.0399	0.0384	0.0366
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0043***	***0.0030***	***0.0021***	***0.0017***	***0.0014***	***0.0028***	***0.0060***	***0.0141***	***0.0234***	***0.0220***	***0.0188***	***0.0182***	***0.0159***	***0.0148***	***0.0158***	***0.0166***	***0.0184***	***0.0204***	***0.0217***	***0.0207***	***0.0154***	***0.0124***	***0.0112***	***0.0092***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.83E-03	2.00E-03	1.42E-03	1.11E-03	9.31E-04	1.84E-03	4.02E-03	9.37E-03	1.56E-02	1.47E-02	1.25E-02	1.21E-02	1.06E-02	9.87E-03	1.05E-02	1.10E-02	1.23E-02	1.36E-02	1.45E-02	1.38E-02	1.03E-02	8.27E-03	7.47E-03	6.15E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.42E-03	1.00E-03	7.11E-04	5.55E-04	4.66E-04	9.20E-04	2.01E-03	4.68E-03	7.80E-03	7.34E-03	6.25E-03	6.07E-03	5.28E-03	4.93E-03	5.26E-03	5.52E-03	6.13E-03	6.80E-03	7.23E-03	6.88E-03	5.15E-03	4.13E-03	3.73E-03	3.07E-03
	Emission in each Box of 1st jet	g/s	4.05E-04	2.86E-04	2.03E-04	1.59E-04	1.33E-04	2.63E-04	5.74E-04	1.34E-03	2.23E-03	2.10E-03	1.79E-03	1.73E-03	1.51E-03	1.41E-03	1.50E-03	1.58E-03	1.75E-03	1.94E-03	2.07E-03	1.97E-03	1.47E-03	1.18E-03	1.07E-03	8.78E-04
	Emission in each Box of 2nd jet	g/s	7.08E-04	5.00E-04	3.56E-04	2.78E-04	2.33E-04	4.60E-04	1.00E-03	2.34E-03	3.90E-03	3.67E-03	3.13E-03	3.04E-03	2.64E-03	2.47E-03	2.63E-03	2.76E-03	3.07E-03	3.40E-03	3.62E-03	3.44E-03	2.57E-03	2.07E-03	1.87E-03	1.54E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0046***	***0.0044***	***0.0037***	***0.0036***	***0.0028***	***0.0026***	***0.0028***	***0.0029***	***0.0032***	***0.0036***	***0.0038***	***0.0037***	***0.0027***	***0.0021***	***0.0018***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.59E-04	4.39E-04	3.12E-04	2.33E-04	1.93E-04	2.68E-04	5.73E-04	1.63E-03	3.10E-03	2.92E-03	2.48E-03	2.39E-03	1.87E-03	1.72E-03	1.85E-03	1.94E-03	2.14E-03	2.37E-03	2.56E-03	2.49E-03	1.80E-03	1.37E-03	1.23E-03	1.03E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.80E-04	2.20E-04	1.56E-04	1.16E-04	9.67E-05	1.34E-04	2.87E-04	8.13E-04	1.55E-03	1.46E-03	1.24E-03	1.20E-03	9.34E-04	8.60E-04	9.27E-04	9.72E-04	1.07E-03	1.19E-03	1.28E-03	1.24E-03	9.01E-04	6.86E-04	6.15E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	7.99E-05	6.28E-05	4.46E-05	3.32E-05	2.76E-05	3.84E-05	8.19E-05	2.32E-04	4.43E-04	4.17E-04	3.54E-04	3.42E-04	2.67E-04	2.46E-04	2.65E-04	2.78E-04	3.05E-04	3.39E-04	3.66E-04	3.55E-04	2.57E-04	1.96E-04	1.76E-04	1.47E-04
	Emission in each Box of 2nd jet	g/s	1.40E-04	1.10E-04	7.80E-05	5.82E-05	4.84E-05	6.71E-05	1.43E-04	4.07E-04	7.75E-04	7.29E-04	6.19E-04	5.98E-04	4.67E-04	4.30E-04	4.64E-04	4.86E-04	5.34E-04	5.93E-04	6.40E-04	6.21E-04	4.51E-04	3.43E-04	3.08E-04	2.58E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1690	0.1452	0.1462	0.1537	0.1561	0.2581	0.2723	0.2463	0.2730	0.2623	0.2523	0.2579	0.2421	0.2413	0.2502	0.2485	0.2595	0.2709	0.2709	0.2685	0.2424	0.2377	0.2300	0.2129
	NO2	g/vehicle/km	0.0333	0.0319	0.0322	0.0323	0.0325	0.0377	0.0389	0.0428	0.0543	0.0522	0.0500	0.0508	0.0428	0.0421	0.0440	0.0437	0.0451	0.0472	0.0479	0.0485	0.0425	0.0395	0.0379	0.0357
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0043***	***0.0030***	***0.0021***	***0.0016***	***0.0014***	***0.0027***	***0.0060***	***0.0137***	***0.0228***	***0.0213***	***0.0188***	***0.0184***	***0.0156***	***0.0145***	***0.0160***	***0.0166***	***0.0181***	***0.0203***	***0.0215***	***0.0204***	***0.0152***	***0.0123***	***0.0111***	***0.0090***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.85E-03	1.99E-03	1.38E-03	1.08E-03	9.08E-04	1.78E-03	4.02E-03	9.14E-03	1.52E-02	1.42E-02	1.26E-02	1.23E-02	1.04E-02	9.69E-03	1.06E-02	1.11E-02	1.20E-02	1.35E-02	1.43E-02	1.36E-02	1.01E-02	8.17E-03	7.37E-03	6.00E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.43E-03	9.95E-04	6.90E-04	5.38E-04	4.54E-04	8.92E-04	2.01E-03	4.57E-03	7.61E-03	7.10E-03	6.28E-03	6.14E-03	5.19E-03	4.85E-03	5.32E-03	5.55E-03	6.02E-03	6.77E-03	7.16E-03	6.81E-03	5.06E-03	4.08E-03	3.69E-03	3.00E-03
	Emission in each Box of 1st jet	g/s	4.07E-04	2.84E-04	1.97E-04	1.54E-04	1.30E-04	2.55E-04	5.74E-04	1.31E-03	2.18E-03	2.03E-03	1.79E-03	1.75E-03	1.48E-03	1.38E-03	1.52E-03	1.58E-03	1.72E-03	1.94E-03	2.04E-03	1.94E-03	1.45E-03	1.17E-03	1.05E-03	8.57E-04
	Emission in each Box of 2nd jet	g/s	7.13E-04	4.97E-04	3.45E-04	2.69E-04	2.27E-04	4.46E-04	1.00E-03	2.28E-03	3.81E-03	3.55E-03	3.14E-03	3.07E-03	2.59E-03	2.42E-03	2.66E-03	2.77E-03	3.01E-03	3.39E-03	3.58E-03	3.40E-03	2.53E-03	2.04E-03	1.84E-03	1.50E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0045***	***0.0042***	***0.0037***	***0.0036***	***0.0028***	***0.0025***	***0.0028***	***0.0029***	***0.0031***	***0.0035***	***0.0038***	***0.0037***	***0.0027***	***0.0020***	***0.0018***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.62E-04	4.37E-04	3.03E-04	2.26E-04	1.89E-04	2.61E-04	5.73E-04	1.59E-03	3.03E-03	2.82E-03	2.49E-03	2.42E-03	1.83E-03	1.69E-03	1.87E-03	1.95E-03	2.10E-03	2.36E-03	2.53E-03	2.46E-03	1.77E-03	1.36E-03	1.22E-03	1.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.81E-04	2.19E-04	1.52E-04	1.13E-04	9.45E-05	1.30E-04	2.87E-04	7.94E-04	1.51E-03	1.41E-03	1.24E-03	1.21E-03	9.17E-04	8.46E-04	9.37E-04	9.75E-04	1.05E-03	1.18E-03	1.27E-03	1.23E-03	8.86E-04	6.78E-04	6.08E-04	5.03E-04
	Emission in each Box of 1st jet	g/s	8.03E-05	6.24E-05	4.33E-05	3.23E-05	2.70E-05	3.72E-05	8.19E-05	2.27E-04	4.33E-04	4.04E-04	3.55E-04	3.46E-04	2.62E-04	2.42E-04	2.68E-04	2.79E-04	2.99E-04	3.37E-04	3.62E-04	3.51E-04	2.53E-04	1.94E-04	1.74E-04	1.44E-04
	Emission in each Box of 2nd jet	g/s	1.41E-04	1.09E-04	7.59E-05	5.65E-05	4.72E-05	6.52E-05	1.43E-04	3.97E-04	7.57E-04	7.06E-04	6.21E-04	6.05E-04	4.58E-04	4.23E-04	4.68E-04	4.88E-04	5.24E-04	5.91E-04	6.33E-04	6.15E-04	4.43E-04	3.39E-04	3.04E-04	2.52E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1712	0.1481	0.1491	0.1568	0.1593	0.2635	0.2777	0.2525	0.2763	0.2633	0.2563	0.2583	0.2467	0.2455	0.2489	0.2474	0.2659	0.2702	0.2787	0.2685	0.2425	0.2378	0.2302	0.2158
	NO2	g/vehicle/km	0.0337	0.0325	0.0328	0.0329	0.0331	0.0385	0.0396	0.0438	0.0549	0.0523	0.0507	0.0509	0.0436	0.0428	0.0439	0.0436	0.0463	0.0471	0.0493	0.0485	0.0425	0.0395	0.0380	0.0362
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0043***	***0.0030***	***0.0021***	***0.0016***	***0.0014***	***0.0027***	***0.0061***	***0.0141***	***0.0231***	***0.0214***	***0.0191***	***0.0185***	***0.0159***	***0.0148***	***0.0159***	***0.0166***	***0.0185***	***0.0203***	***0.0221***	***0.0204***	***0.0152***	***0.0123***	***0.0111***	***0.0091***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.89E-03	2.03E-03	1.41E-03	1.10E-03	9.26E-04	1.82E-03	4.10E-03	9.37E-03	1.54E-02	1.42E-02	1.27E-02	1.23E-02	1.06E-02	9.87E-03	1.06E-02	1.10E-02	1.23E-02	1.35E-02	1.47E-02	1.36E-02	1.01E-02	8.17E-03	7.38E-03	6.08E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.44E-03	1.01E-03	7.03E-04	5.49E-04	4.63E-04	9.10E-04	2.05E-03	4.68E-03	7.70E-03	7.12E-03	6.37E-03	6.15E-03	5.28E-03	4.93E-03	5.30E-03	5.52E-03	6.17E-03	6.76E-03	7.36E-03	6.80E-03	5.06E-03	4.09E-03	3.69E-03	3.04E-03
	Emission in each Box of 1st jet	g/s	4.13E-04	2.90E-04	2.01E-04	1.57E-04	1.32E-04	2.60E-04	5.85E-04	1.34E-03	2.20E-03	2.04E-03	1.82E-03	1.76E-03	1.51E-03	1.41E-03	1.51E-03	1.58E-03	1.76E-03	1.93E-03	2.10E-03	1.94E-03	1.45E-03	1.17E-03	1.05E-03	8.68E-04
	Emission in each Box of 2nd jet	g/s	7.22E-04	5.07E-04	3.52E-04	2.75E-04	2.31E-04	4.55E-04	1.02E-03	2.34E-03	3.85E-03	3.56E-03	3.19E-03	3.08E-03	2.64E-03	2.47E-03	2.65E-03	2.76E-03	3.09E-03	3.38E-03	3.68E-03	3.40E-03	2.53E-03	2.04E-03	1.84E-03	1.52E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0046***	***0.0042***	***0.0038***	***0.0036***	***0.0028***	***0.0026***	***0.0028***	***0.0029***	***0.0032***	***0.0035***	***0.0039***	***0.0037***	***0.0027***	***0.0020***	***0.0018***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.69E-04	4.45E-04	3.09E-04	2.30E-04	1.93E-04	2.66E-04	5.84E-04	1.63E-03	3.06E-03	2.83E-03	2.52E-03	2.42E-03	1.87E-03	1.72E-03	1.87E-03	1.94E-03	2.15E-03	2.35E-03	2.60E-03	2.46E-03	1.77E-03	1.36E-03	1.22E-03	1.02E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.85E-04	2.23E-04	1.54E-04	1.15E-04	9.63E-05	1.33E-04	2.92E-04	8.13E-04	1.53E-03	1.42E-03	1.26E-03	1.21E-03	9.34E-04	8.60E-04	9.33E-04	9.72E-04	1.07E-03	1.18E-03	1.30E-03	1.23E-03	8.87E-04	6.79E-04	6.09E-04	5.09E-04
	Emission in each Box of 1st jet	g/s	8.13E-05	6.36E-05	4.41E-05	3.29E-05	2.75E-05	3.80E-05	8.35E-05	2.32E-04	4.38E-04	4.05E-04	3.61E-04	3.46E-04	2.67E-04	2.46E-04	2.67E-04	2.78E-04	3.07E-04	3.36E-04	3.72E-04	3.51E-04	2.53E-04	1.94E-04	1.74E-04	1.46E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	1.11E-04	7.72E-05	5.76E-05	4.81E-05	6.64E-05	1.46E-04	4.07E-04	7.66E-04	7.08E-04	6.31E-04	6.06E-04	4.67E-04	4.30E-04	4.67E-04	4.86E-04	5.37E-04	5.89E-04	6.51E-04	6.15E-04	4.43E-04	3.39E-04	3.04E-04	2.55E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1700	0.1470	0.1480	0.1546	0.1620	0.2678	0.2808	0.2494	0.2786	0.2661	0.2594	0.2580	0.2495	0.2519	0.2536	0.2537	0.2631	0.2691	0.2773	0.2653	0.2497	0.2434	0.2357	0.2210
	NO2	g/vehicle/km	0.0335	0.0323	0.0325	0.0325	0.0336	0.0391	0.0400	0.0433	0.0553	0.0529	0.0513	0.0508	0.0441	0.0439	0.0447	0.0446	0.0458	0.0469	0.0490	0.0479	0.0437	0.0404	0.0388	0.0370
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0043***	***0.0030***	***0.0021***	***0.0016***	***0.0014***	***0.0028***	***0.0062***	***0.0139***	***0.0233***	***0.0216***	***0.0194***	***0.0184***	***0.0160***	***0.0152***	***0.0162***	***0.0170***	***0.0183***	***0.0202***	***0.0220***	***0.0202***	***0.0156***	***0.0125***	***0.0113***	***0.0093***
	2/3 of NO emission rate in 1st 50m Box	g/s	2.87E-03	2.01E-03	1.40E-03	1.08E-03	9.42E-04	1.85E-03	4.14E-03	9.25E-03	1.55E-02	1.44E-02	1.29E-02	1.23E-02	1.07E-02	1.01E-02	1.08E-02	1.13E-02	1.22E-02	1.35E-02	1.46E-02	1.34E-02	1.04E-02	8.37E-03	7.55E-03	6.22E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.43E-03	1.01E-03	6.98E-04	5.42E-04	4.71E-04	9.25E-04	2.07E-03	4.63E-03	7.77E-03	7.20E-03	6.45E-03	6.14E-03	5.35E-03	5.06E-03	5.40E-03	5.66E-03	6.11E-03	6.73E-03	7.32E-03	6.72E-03	5.21E-03	4.18E-03	3.78E-03	3.11E-03
	Emission in each Box of 1st jet	g/s	4.10E-04	2.88E-04	1.99E-04	1.55E-04	1.35E-04	2.64E-04	5.92E-04	1.32E-03	2.22E-03	2.06E-03	1.84E-03	1.75E-03	1.53E-03	1.45E-03	1.54E-03	1.62E-03	1.75E-03	1.92E-03	2.09E-03	1.92E-03	1.49E-03	1.20E-03	1.08E-03	8.89E-04
	Emission in each Box of 2nd jet	g/s	7.17E-04	5.03E-04	3.49E-04	2.71E-04	2.35E-04	4.62E-04	1.04E-03	2.31E-03	3.88E-03	3.60E-03	3.23E-03	3.07E-03	2.67E-03	2.53E-03	2.70E-03	2.83E-03	3.05E-03	3.36E-03	3.66E-03	3.36E-03	2.60E-03	2.09E-03	1.89E-03	1.56E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0004***	***0.0009***	***0.0024***	***0.0046***	***0.0043***	***0.0038***	***0.0036***	***0.0028***	***0.0026***	***0.0029***	***0.0030***	***0.0032***	***0.0035***	***0.0039***	***0.0036***	***0.0027***	***0.0021***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.65E-04	4.42E-04	3.07E-04	2.27E-04	1.95E-04	2.70E-04	5.90E-04	1.61E-03	3.08E-03	2.86E-03	2.55E-03	2.42E-03	1.89E-03	1.76E-03	1.90E-03	1.99E-03	2.13E-03	2.35E-03	2.59E-03	2.43E-03	1.82E-03	1.39E-03	1.24E-03	1.04E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.83E-04	2.21E-04	1.53E-04	1.14E-04	9.77E-05	1.35E-04	2.95E-04	8.03E-04	1.54E-03	1.43E-03	1.28E-03	1.21E-03	9.44E-04	8.82E-04	9.50E-04	9.96E-04	1.06E-03	1.17E-03	1.30E-03	1.21E-03	9.11E-04	6.94E-04	6.22E-04	5.21E-04
	Emission in each Box of 1st jet	g/s	8.07E-05	6.31E-05	4.38E-05	3.25E-05	2.79E-05	3.86E-05	8.43E-05	2.30E-04	4.41E-04	4.09E-04	3.64E-04	3.45E-04	2.70E-04	2.52E-04	2.71E-04	2.85E-04	3.04E-04	3.35E-04	3.70E-04	3.47E-04	2.60E-04	1.98E-04	1.78E-04	1.49E-04
	Emission in each Box of 2nd jet	g/s	1.41E-04	1.10E-04	7.67E-05	5.68E-05	4.89E-05	6.75E-05	1.48E-04	4.02E-04	7.71E-04	7.16E-04	6.38E-04	6.04E-04	4.72E-04	4.41E-04	4.75E-04	4.98E-04	5.31E-04	5.87E-04	6.48E-04	6.07E-04	4.55E-04	3.47E-04	3.11E-04	2.60E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1917	0.1670	0.1675	0.1765	0.1785	0.2959	0.3114	0.2859	0.3154	0.3012	0.2824	0.2874	0.2798	0.2766	0.2805	0.2791	0.2932	0.2993	0.3103	0.3012	0.2755	0.2701	0.2618	0.2444
	NO2	g/vehicle/km	0.0375	0.0363	0.0365	0.0367	0.0368	0.0429	0.0441	0.0493	0.0623	0.0596	0.0557	0.0564	0.0491	0.0479	0.0491	0.0488	0.0508	0.0520	0.0546	0.0541	0.0479	0.0445	0.0429	0.0407
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0048***	***0.0034***	***0.0024***	***0.0019***	***0.0016***	***0.0031***	***0.0069***	***0.0159***	***0.0264***	***0.0244***	***0.0211***	***0.0205***	***0.0180***	***0.0167***	***0.0179***	***0.0187***	***0.0204***	***0.0224***	***0.0246***	***0.0229***	***0.0172***	***0.0139***	***0.0126***	***0.0103***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.23E-03	2.29E-03	1.58E-03	1.24E-03	1.04E-03	2.04E-03	4.60E-03	1.06E-02	1.76E-02	1.63E-02	1.40E-02	1.37E-02	1.20E-02	1.11E-02	1.19E-02	1.25E-02	1.36E-02	1.50E-02	1.64E-02	1.53E-02	1.15E-02	9.28E-03	8.39E-03	6.88E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.62E-03	1.14E-03	7.90E-04	6.18E-04	5.19E-04	1.02E-03	2.30E-03	5.31E-03	8.80E-03	8.15E-03	7.02E-03	6.84E-03	5.99E-03	5.56E-03	5.97E-03	6.23E-03	6.81E-03	7.48E-03	8.20E-03	7.63E-03	5.75E-03	4.64E-03	4.20E-03	3.44E-03
	Emission in each Box of 1st jet	g/s	4.62E-04	3.27E-04	2.26E-04	1.77E-04	1.48E-04	2.92E-04	6.56E-04	1.52E-03	2.51E-03	2.33E-03	2.01E-03	1.96E-03	1.71E-03	1.59E-03	1.70E-03	1.78E-03	1.94E-03	2.14E-03	2.34E-03	2.18E-03	1.64E-03	1.33E-03	1.20E-03	9.83E-04
	Emission in each Box of 2nd jet	g/s	8.08E-04	5.72E-04	3.95E-04	3.09E-04	2.59E-04	5.11E-04	1.15E-03	2.65E-03	4.40E-03	4.07E-03	3.51E-03	3.42E-03	3.00E-03	2.78E-03	2.98E-03	3.12E-03	3.40E-03	3.74E-03	4.10E-03	3.82E-03	2.87E-03	2.32E-03	2.10E-03	1.72E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0004***	***0.0010***	***0.0027***	***0.0052***	***0.0048***	***0.0042***	***0.0040***	***0.0032***	***0.0029***	***0.0031***	***0.0033***	***0.0035***	***0.0039***	***0.0043***	***0.0041***	***0.0030***	***0.0023***	***0.0021***	***0.0017***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.33E-04	4.98E-04	3.44E-04	2.57E-04	2.14E-04	2.97E-04	6.51E-04	1.83E-03	3.48E-03	3.22E-03	2.77E-03	2.68E-03	2.10E-03	1.93E-03	2.09E-03	2.18E-03	2.36E-03	2.60E-03	2.88E-03	2.74E-03	2.00E-03	1.53E-03	1.37E-03	1.15E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.17E-04	2.49E-04	1.72E-04	1.28E-04	1.07E-04	1.48E-04	3.26E-04	9.15E-04	1.74E-03	1.61E-03	1.38E-03	1.34E-03	1.05E-03	9.63E-04	1.04E-03	1.09E-03	1.18E-03	1.30E-03	1.44E-03	1.37E-03	9.99E-04	7.65E-04	6.87E-04	5.73E-04
	Emission in each Box of 1st jet	g/s	9.04E-05	7.11E-05	4.91E-05	3.67E-05	3.05E-05	4.24E-05	9.30E-05	2.61E-04	4.96E-04	4.60E-04	3.96E-04	3.83E-04	3.00E-04	2.75E-04	2.98E-04	3.11E-04	3.37E-04	3.71E-04	4.12E-04	3.92E-04	2.86E-04	2.19E-04	1.96E-04	1.64E-04
	Emission in each Box of 2nd jet	g/s	1.58E-04	1.24E-04	8.60E-05	6.42E-05	5.34E-05	7.41E-05	1.63E-04	4.58E-04	8.69E-04	8.06E-04	6.92E-04	6.71E-04	5.26E-04	4.81E-04	5.22E-04	5.45E-04	5.90E-04	6.50E-04	7.21E-04	6.85E-04	5.00E-04	3.83E-04	3.43E-04	2.86E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involvec	086P1
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2101	0.1853	0.1862	0.1982	0.2013	0.3334	0.3503	0.3208	0.3548	0.3398	0.3187	0.3224	0.3098	0.3064	0.3106	0.3094	0.3233	0.3358	0.3413	0.3362	0.3057	0.2999	0.2910	0.2728
	NO2	g/vehicle/km	0.0409	0.0400	0.0402	0.0408	0.0411	0.0481	0.0493	0.0550	0.0697	0.0668	0.0625	0.0629	0.0542	0.0529	0.0542	0.0539	0.0557	0.0579	0.0597	0.0600	0.0529	0.0491	0.0473	0.0451
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0053***	***0.0038***	***0.0026***	***0.0021***	***0.0018***	***0.0035***	***0.0078***	***0.0179***	***0.0297***	***0.0276***	***0.0238***	***0.0230***	***0.0199***	***0.0185***	***0.0198***	***0.0207***	***0.0225***	***0.0252***	***0.0270***	***0.0256***	***0.0191***	***0.0155***	***0.0140***	***0.0115***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.54E-03	2.54E-03	1.76E-03	1.39E-03	1.17E-03	2.30E-03	5.17E-03	1.19E-02	1.98E-02	1.84E-02	1.59E-02	1.54E-02	1.33E-02	1.23E-02	1.32E-02	1.38E-02	1.50E-02	1.68E-02	1.80E-02	1.70E-02	1.28E-02	1.03E-02	9.33E-03	7.68E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.77E-03	1.27E-03	8.78E-04	6.94E-04	5.85E-04	1.15E-03	2.58E-03	5.95E-03	9.89E-03	9.20E-03	7.93E-03	7.68E-03	6.64E-03	6.16E-03	6.61E-03	6.91E-03	7.50E-03	8.39E-03	9.01E-03	8.52E-03	6.38E-03	5.15E-03	4.66E-03	3.84E-03
	Emission in each Box of 1st jet	g/s	5.06E-04	3.63E-04	2.51E-04	1.98E-04	1.67E-04	3.29E-04	7.38E-04	1.70E-03	2.83E-03	2.63E-03	2.27E-03	2.19E-03	1.90E-03	1.76E-03	1.89E-03	1.97E-03	2.14E-03	2.40E-03	2.58E-03	2.43E-03	1.82E-03	1.47E-03	1.33E-03	1.10E-03
	Emission in each Box of 2nd jet	g/s	8.86E-04	6.35E-04	4.39E-04	3.47E-04	2.92E-04	5.76E-04	1.29E-03	2.98E-03	4.95E-03	4.60E-03	3.96E-03	3.84E-03	3.32E-03	3.08E-03	3.30E-03	3.45E-03	3.75E-03	4.20E-03	4.51E-03	4.26E-03	3.19E-03	2.58E-03	2.33E-03	1.92E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0031***	***0.0058***	***0.0054***	***0.0047***	***0.0045***	***0.0035***	***0.0032***	***0.0035***	***0.0036***	***0.0039***	***0.0043***	***0.0047***	***0.0046***	***0.0033***	***0.0025***	***0.0023***	***0.0019***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.90E-04	5.48E-04	3.80E-04	2.86E-04	2.39E-04	3.32E-04	7.28E-04	2.04E-03	3.89E-03	3.61E-03	3.11E-03	2.99E-03	2.32E-03	2.12E-03	2.30E-03	2.41E-03	2.59E-03	2.90E-03	3.16E-03	3.04E-03	2.21E-03	1.69E-03	1.52E-03	1.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.45E-04	2.74E-04	1.90E-04	1.43E-04	1.19E-04	1.66E-04	3.64E-04	1.02E-03	1.94E-03	1.81E-03	1.55E-03	1.50E-03	1.16E-03	1.06E-03	1.15E-03	1.20E-03	1.29E-03	1.45E-03	1.58E-03	1.52E-03	1.10E-03	8.44E-04	7.59E-04	6.35E-04
	Emission in each Box of 1st jet	g/s	9.85E-05	7.83E-05	5.42E-05	4.08E-05	3.41E-05	4.75E-05	1.04E-04	2.92E-04	5.56E-04	5.16E-04	4.44E-04	4.28E-04	3.31E-04	3.04E-04	3.29E-04	3.44E-04	3.70E-04	4.14E-04	4.51E-04	4.34E-04	3.15E-04	2.41E-04	2.17E-04	1.82E-04
	Emission in each Box of 2nd jet	g/s	1.72E-04	1.37E-04	9.49E-05	7.15E-05	5.97E-05	8.30E-05	1.82E-04	5.10E-04	9.72E-04	9.04E-04	7.77E-04	7.49E-04	5.80E-04	5.31E-04	5.76E-04	6.02E-04	6.47E-04	7.24E-04	7.89E-04	7.60E-04	5.52E-04	4.22E-04	3.79E-04	3.18E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086A01-086A09
Enclosure Involved	086P1
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2216	0.1940	0.1951	0.2064	0.2121	0.3492	0.3657	0.3346	0.3696	0.3537	0.3308	0.3353	0.3216	0.3181	0.3234	0.3216	0.3357	0.3477	0.3569	0.3472	0.3171	0.3102	0.3049	0.2858
	NO2	g/vehicle/km	0.0429	0.0415	0.0418	0.0422	0.0429	0.0501	0.0513	0.0571	0.0723	0.0693	0.0646	0.0652	0.0560	0.0547	0.0562	0.0559	0.0577	0.0598	0.0622	0.0618	0.0546	0.0506	0.0493	0.0470
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69	105.69
	Number of 1st 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Number of 2nd 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NO Emission Rate		g/s	***0.0056***	***0.0040***	***0.0028***	***0.0022***	***0.0018***	***0.0036***	***0.0081***	***0.0186***	***0.0309***	***0.0287***	***0.0247***	***0.0239***	***0.0207***	***0.0192***	***0.0206***	***0.0215***	***0.0234***	***0.0261***	***0.0283***	***0.0264***	***0.0198***	***0.0160***	***0.0147***	***0.0121***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.74E-03	2.66E-03	1.84E-03	1.45E-03	1.23E-03	2.41E-03	5.40E-03	1.24E-02	2.06E-02	1.91E-02	1.65E-02	1.60E-02	1.38E-02	1.28E-02	1.38E-02	1.44E-02	1.56E-02	1.74E-02	1.89E-02	1.76E-02	1.32E-02	1.07E-02	9.77E-03	8.05E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.87E-03	1.33E-03	9.20E-04	7.23E-04	6.16E-04	1.21E-03	2.70E-03	6.21E-03	1.03E-02	9.57E-03	8.23E-03	7.98E-03	6.89E-03	6.39E-03	6.88E-03	7.18E-03	7.79E-03	8.69E-03	9.43E-03	8.80E-03	6.61E-03	5.33E-03	4.89E-03	4.02E-03
	Emission in each Box of 1st jet	g/s	5.34E-04	3.80E-04	2.63E-04	2.07E-04	1.76E-04	3.45E-04	7.71E-04	1.77E-03	2.95E-03	2.73E-03	2.35E-03	2.28E-03	1.97E-03	1.83E-03	1.97E-03	2.05E-03	2.23E-03	2.48E-03	2.69E-03	2.51E-03	1.89E-03	1.52E-03	1.40E-03	1.15E-03
	Emission in each Box of 2nd jet	g/s	9.34E-04	6.64E-04	4.60E-04	3.61E-04	3.08E-04	6.03E-04	1.35E-03	3.10E-03	5.15E-03	4.78E-03	4.11E-03	3.99E-03	3.44E-03	3.20E-03	3.44E-03	3.59E-03	3.90E-03	4.35E-03	4.71E-03	4.40E-03	3.31E-03	2.66E-03	2.44E-03	2.01E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0032***	***0.0061***	***0.0056***	***0.0048***	***0.0047***	***0.0036***	***0.0033***	***0.0036***	***0.0037***	***0.0040***	***0.0045***	***0.0049***	***0.0047***	***0.0034***	***0.0026***	***0.0024***	***0.0020***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.23E-04	5.69E-04	3.94E-04	2.96E-04	2.50E-04	3.46E-04	7.57E-04	2.12E-03	4.03E-03	3.75E-03	3.22E-03	3.11E-03	2.40E-03	2.20E-03	2.39E-03	2.49E-03	2.68E-03	2.99E-03	3.29E-03	3.13E-03	2.28E-03	1.74E-03	1.58E-03	1.32E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.61E-04	2.85E-04	1.97E-04	1.48E-04	1.25E-04	1.73E-04	3.78E-04	1.06E-03	2.02E-03	1.87E-03	1.61E-03	1.55E-03	1.20E-03	1.10E-03	1.20E-03	1.25E-03	1.34E-03	1.49E-03	1.64E-03	1.57E-03	1.14E-03	8.70E-04	7.91E-04	6.62E-04
	Emission in each Box of 1st jet	g/s	1.03E-04	8.13E-05	5.63E-05	4.22E-05	3.57E-05	4.95E-05	1.08E-04	3.03E-04	5.76E-04	5.35E-04	4.59E-04	4.44E-04	3.43E-04	3.14E-04	3.42E-04	3.56E-04	3.82E-04	4.27E-04	4.70E-04	4.47E-04	3.25E-04	2.49E-04	2.26E-04	1.89E-04
	Emission in each Box of 2nd jet	g/s	1.81E-04	1.42E-04	9.86E-05	7.39E-05	6.24E-05	8.65E-05	1.89E-04	5.30E-04	1.01E-03	9.37E-04	8.04E-04	7.76E-04	6.00E-04	5.50E-04	5.98E-04	6.23E-04	6.69E-04	7.47E-04	8.22E-04	7.83E-04	5.70E-04	4.35E-04	3.95E-04	3.31E-04
RSP Emission Rate		g/s	***3.19E-04***	***2.20E-04***	***1.52E-04***	***1.20E-04***	***1.03E-04***	***2.17E-04***	***4.87E-04***	***1.01E-03***	***1.49E-03***	***1.40E-03***	***1.25E-03***	***1.21E-03***	***1.14E-03***	***1.08E-03***	***1.14E-03***	***1.20E-03***	***1.25E-03***	***1.38E-03***	***1.47E-03***	***1.37E-03***	***1.09E-03***	***9.16E-04***	***8.39E-04***	***6.93E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.13E-04	1.46E-04	1.02E-04	8.02E-05	6.84E-05	1.44E-04	3.25E-04	6.76E-04	9.92E-04	9.32E-04	8.33E-04	8.05E-04	7.62E-04	7.17E-04	7.59E-04	7.97E-04	8.35E-04	9.20E-04	9.80E-04	9.13E-04	7.28E-04	6.10E-04	5.59E-04	4.62E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.06E-04	7.32E-05	5.08E-05	4.01E-05	3.42E-05	7.22E-05	1.62E-04	3.38E-04	4.96E-04	4.66E-04	4.16E-04	4.03E-04	3.81E-04	3.58E-04	3.80E-04	3.98E-04	4.18E-04	4.60E-04	4.90E-04	4.57E-04	3.64E-04	3.05E-04	2.80E-04	2.31E-04
	Emission in each Box of 1st jet	g/s	3.04E-05	2.09E-05	1.45E-05	1.15E-05	9.77E-06	2.06E-05	4.64E-05	9.66E-05	1.42E-04	1.33E-04	1.19E-04	1.15E-04	1.09E-04	1.02E-04	1.08E-04	1.14E-04	1.19E-04	1.31E-04	1.40E-04	1.30E-04	1.04E-04	8.72E-05	7.99E-05	6.60E-05
	Emission in each Box of 2nd jet	g/s	5.32E-05	3.66E-05	2.54E-05	2.00E-05	1.71E-05	3.61E-05	8.12E-05	1.69E-04	2.48E-04	2.33E-04	2.08E-04	2.01E-04	1.91E-04	1.79E-04	1.90E-04	1.99E-04	2.09E-04	2.30E-04	2.45E-04	2.28E-04	1.82E-04	1.53E-04	1.40E-04	1.16E-04
FSP Emission Rate		g/s	***2.93E-04***	***2.02E-04***	***1.40E-04***	***1.11E-04***	***9.43E-05***	***1.99E-04***	***4.48E-04***	***9.35E-04***	***1.37E-03***	***1.28E-03***	***1.15E-03***	***1.11E-03***	***1.05E-03***	***9.88E-04***	***1.05E-03***	***1.10E-03***	***1.15E-03***	***1.27E-03***	***1.35E-03***	***1.26E-03***	***1.00E-03***	***8.43E-04***	***7.73E-04***	***6.39E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	1.96E-04	1.35E-04	9.35E-05	7.37E-05	6.29E-05	1.33E-04	2.99E-04	6.23E-04	9.13E-04	8.55E-04	7.65E-04	7.40E-04	7.01E-04	6.59E-04	6.98E-04	7.33E-04	7.68E-04	8.46E-04	9.02E-04	8.41E-04	6.70E-04	5.62E-04	5.15E-04	4.26E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	9.78E-05	6.73E-05	4.67E-05	3.69E-05	3.14E-05	6.64E-05	1.49E-04	3.12E-04	4.57E-04	4.27E-04	3.83E-04	3.70E-04	3.51E-04	3.29E-04	3.49E-04	3.66E-04	3.84E-04	4.23E-04	4.51E-04	4.20E-04	3.35E-04	2.81E-04	2.58E-04	2.13E-04
	Emission in each Box of 1st jet	g/s	2.79E-05	1.92E-05	1.34E-05	1.05E-05	8.98E-06	1.90E-05	4.27E-05	8.90E-05	1.30E-04	1.22E-04	1.09E-04	1.06E-04	1.00E-04	9.41E-05	9.97E-05	1.05E-04	1.10E-04	1.21E-04	1.29E-04	1.20E-04	9.57E-05	8.03E-05	7.36E-05	6.09E-05
	Emission in each Box of 2nd jet	g/s	4.89E-05	3.37E-05	2.34E-05	1.84E-05	1.57E-05	3.32E-05	7.47E-05	1.56E-04	2.28E-04	2.14E-04	1.91E-04	1.85E-04	1.75E-04	1.65E-04	1.75E-04	1.83E-04	1.92E-04	2.12E-04	2.25E-04	2.10E-04	1.67E-04	1.41E-04	1.29E-04	1.07E-04
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 65m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 15m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2331	0.2050	0.2067	0.2186	0.2224	0.3657	0.3857	0.3501	0.3885	0.3722	0.3515	0.3533	0.3428	0.3375	0.3394	0.3414	0.3567	0.3674	0.3749	0.3649	0.3336	0.3264	0.3204	0.3000
	NO2	g/vehicle/km	0.0448	0.0436	0.0439	0.0443	0.0447	0.0522	0.0538	0.0595	0.0756	0.0726	0.0684	0.0685	0.0594	0.0578	0.0588	0.0590	0.0609	0.0629	0.0650	0.0646	0.0571	0.0530	0.0516	0.0491
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0128***	***0.0091***	***0.0063***	***0.0050***	***0.0042***	***0.0082***	***0.0185***	***0.0422***	***0.0704***	***0.0654***	***0.0568***	***0.0546***	***0.0477***	***0.0440***	***0.0469***	***0.0495***	***0.0538***	***0.0597***	***0.0643***	***0.0601***	***0.0452***	***0.0364***	***0.0334***	***0.0274***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.52E-03	6.08E-03	4.22E-03	3.32E-03	2.80E-03	5.47E-03	1.23E-02	2.81E-02	4.69E-02	4.36E-02	3.79E-02	3.64E-02	3.18E-02	2.94E-02	3.13E-02	3.30E-02	3.59E-02	3.98E-02	4.29E-02	4.00E-02	3.01E-02	2.43E-02	2.22E-02	1.83E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.26E-03	3.04E-03	2.11E-03	1.66E-03	1.40E-03	2.73E-03	6.16E-03	1.41E-02	2.35E-02	2.18E-02	1.89E-02	1.82E-02	1.59E-02	1.47E-02	1.56E-02	1.65E-02	1.79E-02	1.99E-02	2.14E-02	2.00E-02	1.51E-02	1.21E-02	1.11E-02	9.14E-03
	Emission in each Box of 1st jet	g/s	1.06E-03	7.60E-04	5.28E-04	4.15E-04	3.50E-04	6.84E-04	1.54E-03	3.52E-03	5.86E-03	5.45E-03	4.73E-03	4.55E-03	3.97E-03	3.67E-03	3.91E-03	4.12E-03	4.48E-03	4.97E-03	5.36E-03	5.01E-03	3.77E-03	3.04E-03	2.78E-03	2.29E-03
	Emission in each Box of 2nd jet	g/s	6.08E-04	4.34E-04	3.02E-04	2.37E-04	2.00E-04	3.91E-04	8.80E-04	2.01E-03	3.35E-03	3.11E-03	2.70E-03	2.60E-03	2.27E-03	2.10E-03	2.23E-03	2.36E-03	2.56E-03	2.84E-03	3.06E-03	2.86E-03	2.15E-03	1.73E-03	1.59E-03	1.31E-03
NO_2 Emission Rate		g/s	***0.0025***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0012***	***0.0026***	***0.0072***	***0.0137***	***0.0128***	***0.0110***	***0.0106***	***0.0083***	***0.0075***	***0.0081***	***0.0086***	***0.0092***	***0.0102***	***0.0112***	***0.0106***	***0.0077***	***0.0059***	***0.0054***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.64E-03	1.29E-03	8.97E-04	6.72E-04	5.63E-04	7.81E-04	1.72E-03	4.78E-03	9.13E-03	8.50E-03	7.36E-03	7.06E-03	5.51E-03	5.03E-03	5.42E-03	5.70E-03	6.12E-03	6.81E-03	7.44E-03	7.08E-03	5.16E-03	3.94E-03	3.58E-03	2.99E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.18E-04	6.46E-04	4.49E-04	3.36E-04	2.81E-04	3.91E-04	8.59E-04	2.39E-03	4.57E-03	4.25E-03	3.68E-03	3.53E-03	2.76E-03	2.51E-03	2.71E-03	2.85E-03	3.06E-03	3.40E-03	3.72E-03	3.54E-03	2.58E-03	1.97E-03	1.79E-03	1.50E-03
	Emission in each Box of 1st jet	g/s	2.05E-04	1.62E-04	1.12E-04	8.41E-05	7.03E-05	9.77E-05	2.15E-04	5.97E-04	1.14E-03	1.06E-03	9.21E-04	8.82E-04	6.89E-04	6.28E-04	6.77E-04	7.13E-04	7.66E-04	8.51E-04	9.30E-04	8.86E-04	6.45E-04	4.93E-04	4.48E-04	3.74E-04
	Emission in each Box of 2nd jet	g/s	1.17E-04	9.23E-05	6.41E-05	4.80E-05	4.02E-05	5.58E-05	1.23E-04	3.41E-04	6.52E-04	6.07E-04	5.26E-04	5.04E-04	3.94E-04	3.59E-04	3.87E-04	4.07E-04	4.37E-04	4.86E-04	5.31E-04	5.06E-04	3.68E-04	2.82E-04	2.56E-04	2.14E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2181	0.1900	0.1910	0.2044	0.2076	0.3420	0.3574	0.3277	0.3605	0.3411	0.3243	0.3260	0.3160	0.3135	0.3178	0.3169	0.3307	0.3425	0.3490	0.3422	0.3124	0.3064	0.2975	0.2782
	NO2	g/vehicle/km	0.0422	0.0408	0.0410	0.0418	0.0421	0.0491	0.0501	0.0559	0.0706	0.0670	0.0635	0.0635	0.0551	0.0540	0.0553	0.0551	0.0569	0.0590	0.0609	0.0609	0.0539	0.0501	0.0483	0.0459
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0119***	***0.0085***	***0.0059***	***0.0047***	***0.0039***	***0.0077***	***0.0171***	***0.0395***	***0.0653***	***0.0599***	***0.0524***	***0.0504***	***0.0440***	***0.0409***	***0.0439***	***0.0459***	***0.0499***	***0.0556***	***0.0599***	***0.0563***	***0.0423***	***0.0342***	***0.0310***	***0.0254***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.96E-03	5.64E-03	3.90E-03	3.10E-03	2.61E-03	5.12E-03	1.14E-02	2.63E-02	4.35E-02	4.00E-02	3.49E-02	3.36E-02	2.93E-02	2.73E-02	2.93E-02	3.06E-02	3.32E-02	3.71E-02	3.99E-02	3.76E-02	2.82E-02	2.28E-02	2.06E-02	1.70E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.98E-03	2.82E-03	1.95E-03	1.55E-03	1.31E-03	2.56E-03	5.71E-03	1.32E-02	2.18E-02	2.00E-02	1.75E-02	1.68E-02	1.47E-02	1.36E-02	1.46E-02	1.53E-02	1.66E-02	1.85E-02	2.00E-02	1.88E-02	1.41E-02	1.14E-02	1.03E-02	8.48E-03
	Emission in each Box of 1st jet	g/s	9.96E-04	7.04E-04	4.88E-04	3.88E-04	3.27E-04	6.39E-04	1.43E-03	3.29E-03	5.44E-03	5.00E-03	4.37E-03	4.20E-03	3.66E-03	3.41E-03	3.66E-03	3.83E-03	4.15E-03	4.63E-03	4.99E-03	4.69E-03	3.53E-03	2.85E-03	2.58E-03	2.12E-03
	Emission in each Box of 2nd jet	g/s	5.69E-04	4.03E-04	2.79E-04	2.21E-04	1.87E-04	3.65E-04	8.16E-04	1.88E-03	3.11E-03	2.85E-03	2.49E-03	2.40E-03	2.09E-03	1.95E-03	2.09E-03	2.19E-03	2.37E-03	2.65E-03	2.85E-03	2.68E-03	2.02E-03	1.63E-03	1.47E-03	1.21E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0013***	***0.0010***	***0.0008***	***0.0011***	***0.0024***	***0.0067***	***0.0128***	***0.0118***	***0.0103***	***0.0098***	***0.0077***	***0.0070***	***0.0076***	***0.0080***	***0.0086***	***0.0096***	***0.0105***	***0.0100***	***0.0073***	***0.0056***	***0.0050***	***0.0042***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-03	1.21E-03	8.38E-04	6.34E-04	5.29E-04	7.34E-04	1.60E-03	4.49E-03	8.53E-03	7.85E-03	6.84E-03	6.55E-03	5.11E-03	4.70E-03	5.10E-03	5.33E-03	5.72E-03	6.38E-03	6.97E-03	6.69E-03	4.87E-03	3.73E-03	3.35E-03	2.80E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.71E-04	6.05E-04	4.19E-04	3.17E-04	2.65E-04	3.67E-04	8.01E-04	2.25E-03	4.26E-03	3.93E-03	3.42E-03	3.27E-03	2.56E-03	2.35E-03	2.55E-03	2.66E-03	2.86E-03	3.19E-03	3.48E-03	3.34E-03	2.43E-03	1.86E-03	1.68E-03	1.40E-03
	Emission in each Box of 1st jet	g/s	1.93E-04	1.51E-04	1.05E-04	7.92E-05	6.62E-05	9.18E-05	2.00E-04	5.62E-04	1.07E-03	9.81E-04	8.55E-04	8.18E-04	6.39E-04	5.87E-04	6.37E-04	6.66E-04	7.15E-04	7.98E-04	8.71E-04	8.36E-04	6.08E-04	4.66E-04	4.19E-04	3.50E-04
	Emission in each Box of 2nd jet	g/s	1.10E-04	8.64E-05	5.98E-05	4.53E-05	3.78E-05	5.24E-05	1.14E-04	3.21E-04	6.09E-04	5.61E-04	4.88E-04	4.68E-04	3.65E-04	3.36E-04	3.64E-04	3.80E-04	4.08E-04	4.56E-04	4.98E-04	4.78E-04	3.48E-04	2.66E-04	2.39E-04	2.00E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section 086B01-086B15

Enclosure Involved 086P2

Road Located 086

Vehicle EF Adopte 086

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2058	0.1795	0.1809	0.1908	0.1938	0.3205	0.3357	0.3084	0.3402	0.3249	0.3054	0.3111	0.3015	0.2945	0.2986	0.3012	0.3112	0.3240	0.3325	0.3231	0.2938	0.2881	0.2796	0.2621
	NO2	g/vehicle/km	0.0401	0.0388	0.0391	0.0394	0.0396	0.0463	0.0474	0.0530	0.0669	0.0640	0.0599	0.0608	0.0527	0.0509	0.0522	0.0525	0.0537	0.0559	0.0583	0.0578	0.0509	0.0473	0.0456	0.0434
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0113***	***0.0080***	***0.0055***	***0.0043***	***0.0037***	***0.0072***	***0.0161***	***0.0372***	***0.0616***	***0.0571***	***0.0493***	***0.0481***	***0.0419***	***0.0384***	***0.0413***	***0.0437***	***0.0469***	***0.0526***	***0.0570***	***0.0532***	***0.0398***	***0.0322***	***0.0291***	***0.0240***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.52E-03	5.33E-03	3.69E-03	2.89E-03	2.44E-03	4.79E-03	1.07E-02	2.48E-02	4.11E-02	3.81E-02	3.29E-02	3.21E-02	2.80E-02	2.56E-02	2.75E-02	2.91E-02	3.13E-02	3.51E-02	3.80E-02	3.55E-02	2.65E-02	2.14E-02	1.94E-02	1.60E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.76E-03	2.66E-03	1.85E-03	1.45E-03	1.22E-03	2.40E-03	5.36E-03	1.24E-02	2.05E-02	1.90E-02	1.64E-02	1.60E-02	1.40E-02	1.28E-02	1.38E-02	1.46E-02	1.56E-02	1.75E-02	1.90E-02	1.77E-02	1.33E-02	1.07E-02	9.70E-03	7.99E-03
	Emission in each Box of 1st jet	g/s	9.40E-04	6.66E-04	4.62E-04	3.62E-04	3.05E-04	5.99E-04	1.34E-03	3.10E-03	5.14E-03	4.76E-03	4.11E-03	4.01E-03	3.50E-03	3.20E-03	3.44E-03	3.64E-03	3.91E-03	4.38E-03	4.75E-03	4.43E-03	3.32E-03	2.68E-03	2.43E-03	2.00E-03
	Emission in each Box of 2nd jet	g/s	5.37E-04	3.80E-04	2.64E-04	2.07E-04	1.74E-04	3.42E-04	7.66E-04	1.77E-03	2.93E-03	2.72E-03	2.35E-03	2.29E-03	2.00E-03	1.83E-03	1.96E-03	2.08E-03	2.23E-03	2.51E-03	2.72E-03	2.53E-03	1.90E-03	1.53E-03	1.39E-03	1.14E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0017***	***0.0012***	***0.0009***	***0.0007***	***0.0010***	***0.0023***	***0.0064***	***0.0121***	***0.0113***	***0.0097***	***0.0094***	***0.0073***	***0.0066***	***0.0072***	***0.0076***	***0.0081***	***0.0091***	***0.0100***	***0.0095***	***0.0069***	***0.0053***	***0.0047***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.46E-03	1.15E-03	7.99E-04	5.97E-04	4.99E-04	6.92E-04	1.51E-03	4.25E-03	8.08E-03	7.50E-03	6.46E-03	6.27E-03	4.89E-03	4.43E-03	4.80E-03	5.08E-03	5.40E-03	6.06E-03	6.66E-03	6.34E-03	4.60E-03	3.52E-03	3.16E-03	2.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.32E-04	5.75E-04	3.99E-04	2.99E-04	2.49E-04	3.46E-04	7.57E-04	2.13E-03	4.04E-03	3.75E-03	3.23E-03	3.13E-03	2.45E-03	2.21E-03	2.40E-03	2.54E-03	2.70E-03	3.03E-03	3.33E-03	3.17E-03	2.30E-03	1.76E-03	1.58E-03	1.32E-03
	Emission in each Box of 1st jet	g/s	1.83E-04	1.44E-04	9.99E-05	7.46E-05	6.24E-05	8.65E-05	1.89E-04	5.32E-04	1.01E-03	9.38E-04	8.07E-04	7.83E-04	6.11E-04	5.54E-04	6.01E-04	6.34E-04	6.75E-04	7.57E-04	8.33E-04	7.93E-04	5.75E-04	4.40E-04	3.95E-04	3.31E-04
	Emission in each Box of 2nd jet	g/s	1.05E-04	8.22E-05	5.71E-05	4.26E-05	3.56E-05	4.94E-05	1.08E-04	3.04E-04	5.77E-04	5.36E-04	4.61E-04	4.48E-04	3.49E-04	3.16E-04	3.43E-04	3.63E-04	3.85E-04	4.33E-04	4.76E-04	4.53E-04	3.28E-04	2.52E-04	2.26E-04	1.89E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1934	0.1685	0.1691	0.1826	0.1855	0.3083	0.3231	0.2940	0.3243	0.3099	0.2909	0.2959	0.2865	0.2846	0.2885	0.2860	0.3016	0.3082	0.3165	0.3061	0.2788	0.2779	0.2685	0.2507
	NO2	g/vehicle/km	0.0379	0.0367	0.0368	0.0379	0.0381	0.0446	0.0457	0.0506	0.0640	0.0612	0.0573	0.0579	0.0503	0.0493	0.0505	0.0500	0.0522	0.0534	0.0556	0.0549	0.0485	0.0457	0.0439	0.0417
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0106***	***0.0075***	***0.0052***	***0.0042***	***0.0035***	***0.0069***	***0.0155***	***0.0354***	***0.0587***	***0.0545***	***0.0470***	***0.0457***	***0.0399***	***0.0371***	***0.0399***	***0.0415***	***0.0455***	***0.0500***	***0.0543***	***0.0504***	***0.0378***	***0.0310***	***0.0280***	***0.0229***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.06E-03	5.00E-03	3.45E-03	2.77E-03	2.33E-03	4.61E-03	1.03E-02	2.36E-02	3.92E-02	3.63E-02	3.13E-02	3.05E-02	2.66E-02	2.48E-02	2.66E-02	2.76E-02	3.03E-02	3.34E-02	3.62E-02	3.36E-02	2.52E-02	2.07E-02	1.86E-02	1.53E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.53E-03	2.50E-03	1.73E-03	1.39E-03	1.17E-03	2.31E-03	5.16E-03	1.18E-02	1.96E-02	1.82E-02	1.57E-02	1.52E-02	1.33E-02	1.24E-02	1.33E-02	1.38E-02	1.52E-02	1.67E-02	1.81E-02	1.68E-02	1.26E-02	1.03E-02	9.32E-03	7.64E-03
	Emission in each Box of 1st jet	g/s	8.83E-04	6.25E-04	4.32E-04	3.46E-04	2.92E-04	5.76E-04	1.29E-03	2.95E-03	4.90E-03	4.54E-03	3.92E-03	3.81E-03	3.32E-03	3.10E-03	3.32E-03	3.46E-03	3.79E-03	4.17E-03	4.52E-03	4.20E-03	3.15E-03	2.58E-03	2.33E-03	1.91E-03
	Emission in each Box of 2nd jet	g/s	5.05E-04	3.57E-04	2.47E-04	1.98E-04	1.67E-04	3.29E-04	7.37E-04	1.69E-03	2.80E-03	2.59E-03	2.24E-03	2.18E-03	1.90E-03	1.77E-03	1.90E-03	1.97E-03	2.17E-03	2.38E-03	2.59E-03	2.40E-03	1.80E-03	1.48E-03	1.33E-03	1.09E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0009***	***0.0007***	***0.0010***	***0.0022***	***0.0061***	***0.0116***	***0.0108***	***0.0093***	***0.0090***	***0.0070***	***0.0064***	***0.0070***	***0.0073***	***0.0079***	***0.0087***	***0.0095***	***0.0090***	***0.0066***	***0.0051***	***0.0046***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.38E-03	1.09E-03	7.52E-04	5.74E-04	4.80E-04	6.68E-04	1.46E-03	4.06E-03	7.72E-03	7.17E-03	6.17E-03	5.97E-03	4.66E-03	4.29E-03	4.65E-03	4.84E-03	5.24E-03	5.78E-03	6.36E-03	6.03E-03	4.38E-03	3.40E-03	3.04E-03	2.54E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.92E-04	5.44E-04	3.76E-04	2.87E-04	2.40E-04	3.34E-04	7.30E-04	2.03E-03	3.86E-03	3.58E-03	3.08E-03	2.99E-03	2.33E-03	2.14E-03	2.33E-03	2.42E-03	2.62E-03	2.89E-03	3.18E-03	3.01E-03	2.19E-03	1.70E-03	1.52E-03	1.27E-03
	Emission in each Box of 1st jet	g/s	1.73E-04	1.36E-04	9.40E-05	7.18E-05	6.00E-05	8.35E-05	1.83E-04	5.08E-04	9.66E-04	8.96E-04	7.71E-04	7.46E-04	5.83E-04	5.36E-04	5.82E-04	6.05E-04	6.55E-04	7.23E-04	7.95E-04	7.53E-04	5.48E-04	4.25E-04	3.81E-04	3.18E-04
	Emission in each Box of 2nd jet	g/s	9.89E-05	7.77E-05	5.37E-05	4.10E-05	3.43E-05	4.77E-05	1.04E-04	2.90E-04	5.52E-04	5.12E-04	4.41E-04	4.27E-04	3.33E-04	3.06E-04	3.32E-04	3.45E-04	3.74E-04	4.13E-04	4.54E-04	4.31E-04	3.13E-04	2.43E-04	2.17E-04	1.81E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1740	0.1505	0.1516	0.1594	0.1620	0.2692	0.2788	0.2556	0.2859	0.2717	0.2594	0.2633	0.2565	0.2536	0.2589	0.2555	0.2686	0.2785	0.2790	0.2747	0.2497	0.2420	0.2357	0.2197
	NO2	g/vehicle/km	0.0343	0.0330	0.0333	0.0334	0.0336	0.0393	0.0397	0.0443	0.0567	0.0539	0.0513	0.0518	0.0452	0.0442	0.0455	0.0449	0.0467	0.0485	0.0493	0.0496	0.0437	0.0401	0.0388	0.0368
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0095***	***0.0067***	***0.0046***	***0.0036***	***0.0031***	***0.0060***	***0.0134***	***0.0308***	***0.0518***	***0.0477***	***0.0419***	***0.0407***	***0.0357***	***0.0331***	***0.0358***	***0.0370***	***0.0405***	***0.0452***	***0.0479***	***0.0452***	***0.0338***	***0.0270***	***0.0245***	***0.0201***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.35E-03	4.46E-03	3.10E-03	2.42E-03	2.04E-03	4.03E-03	8.91E-03	2.05E-02	3.45E-02	3.18E-02	2.79E-02	2.71E-02	2.38E-02	2.21E-02	2.38E-02	2.47E-02	2.70E-02	3.02E-02	3.19E-02	3.01E-02	2.26E-02	1.80E-02	1.64E-02	1.34E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.18E-03	2.23E-03	1.55E-03	1.21E-03	1.02E-03	2.01E-03	4.45E-03	1.03E-02	1.73E-02	1.59E-02	1.40E-02	1.36E-02	1.19E-02	1.10E-02	1.19E-02	1.23E-02	1.35E-02	1.51E-02	1.60E-02	1.51E-02	1.13E-02	9.00E-03	8.18E-03	6.70E-03
	Emission in each Box of 1st jet	g/s	7.94E-04	5.58E-04	3.87E-04	3.02E-04	2.55E-04	5.03E-04	1.11E-03	2.57E-03	4.32E-03	3.98E-03	3.49E-03	3.39E-03	2.97E-03	2.76E-03	2.98E-03	3.09E-03	3.37E-03	3.77E-03	3.99E-03	3.77E-03	2.82E-03	2.25E-03	2.04E-03	1.67E-03
	Emission in each Box of 2nd jet	g/s	4.54E-04	3.19E-04	2.21E-04	1.73E-04	1.46E-04	2.88E-04	6.36E-04	1.47E-03	2.47E-03	2.27E-03	2.00E-03	1.94E-03	1.70E-03	1.58E-03	1.70E-03	1.76E-03	1.93E-03	2.15E-03	2.28E-03	2.15E-03	1.61E-03	1.29E-03	1.17E-03	9.57E-04
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0006***	***0.0009***	***0.0019***	***0.0053***	***0.0103***	***0.0095***	***0.0083***	***0.0080***	***0.0063***	***0.0058***	***0.0063***	***0.0065***	***0.0070***	***0.0079***	***0.0085***	***0.0082***	***0.0059***	***0.0045***	***0.0040***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.25E-03	9.80E-04	6.80E-04	5.07E-04	4.23E-04	5.87E-04	1.27E-03	3.56E-03	6.84E-03	6.32E-03	5.52E-03	5.34E-03	4.19E-03	3.84E-03	4.19E-03	4.34E-03	4.69E-03	5.25E-03	5.64E-03	5.44E-03	3.94E-03	2.99E-03	2.69E-03	2.24E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.26E-04	4.90E-04	3.40E-04	2.53E-04	2.12E-04	2.94E-04	6.34E-04	1.78E-03	3.42E-03	3.16E-03	2.76E-03	2.67E-03	2.10E-03	1.92E-03	2.10E-03	2.17E-03	2.35E-03	2.62E-03	2.82E-03	2.72E-03	1.97E-03	1.49E-03	1.35E-03	1.12E-03
	Emission in each Box of 1st jet	g/s	1.57E-04	1.23E-04	8.50E-05	6.33E-05	5.29E-05	7.34E-05	1.59E-04	4.45E-04	8.55E-04	7.90E-04	6.90E-04	6.67E-04	5.24E-04	4.80E-04	5.24E-04	5.42E-04	5.87E-04	6.56E-04	7.05E-04	6.80E-04	4.93E-04	3.73E-04	3.37E-04	2.80E-04
	Emission in each Box of 2nd jet	g/s	8.95E-05	7.00E-05	4.86E-05	3.62E-05	3.02E-05	4.19E-05	9.06E-05	2.54E-04	4.89E-04	4.51E-04	3.94E-04	3.81E-04	3.00E-04	2.74E-04	2.99E-04	3.10E-04	3.35E-04	3.75E-04	4.03E-04	3.88E-04	2.82E-04	2.13E-04	1.92E-04	1.60E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1680	0.1461	0.1508	0.1586	0.1602	0.2663	0.2723	0.2525	0.2797	0.2712	0.2513	0.2550	0.2467	0.2455	0.2473	0.2474	0.2643	0.2719	0.2739	0.2716	0.2468	0.2406	0.2329	0.2183
	NO2	g/vehicle/km	0.0331	0.0321	0.0331	0.0332	0.0333	0.0389	0.0389	0.0438	0.0556	0.0539	0.0498	0.0502	0.0436	0.0428	0.0436	0.0436	0.0460	0.0474	0.0485	0.0490	0.0432	0.0399	0.0384	0.0366
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0092***	***0.0065***	***0.0046***	***0.0036***	***0.0030***	***0.0060***	***0.0130***	***0.0304***	***0.0507***	***0.0477***	***0.0406***	***0.0394***	***0.0343***	***0.0320***	***0.0342***	***0.0359***	***0.0398***	***0.0441***	***0.0470***	***0.0447***	***0.0334***	***0.0269***	***0.0242***	***0.0200***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.14E-03	4.33E-03	3.08E-03	2.41E-03	2.02E-03	3.98E-03	8.70E-03	2.03E-02	3.38E-02	3.18E-02	2.71E-02	2.63E-02	2.29E-02	2.14E-02	2.28E-02	2.39E-02	2.66E-02	2.94E-02	3.13E-02	2.98E-02	2.23E-02	1.79E-02	1.62E-02	1.33E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.07E-03	2.17E-03	1.54E-03	1.20E-03	1.01E-03	1.99E-03	4.35E-03	1.01E-02	1.69E-02	1.59E-02	1.35E-02	1.31E-02	1.14E-02	1.07E-02	1.14E-02	1.20E-02	1.33E-02	1.47E-02	1.57E-02	1.49E-02	1.11E-02	8.95E-03	8.08E-03	6.66E-03
	Emission in each Box of 1st jet	g/s	7.67E-04	5.42E-04	3.85E-04	3.01E-04	2.52E-04	4.98E-04	1.09E-03	2.54E-03	4.22E-03	3.97E-03	3.38E-03	3.29E-03	2.86E-03	2.67E-03	2.85E-03	2.99E-03	3.32E-03	3.68E-03	3.92E-03	3.73E-03	2.79E-03	2.24E-03	2.02E-03	1.66E-03
	Emission in each Box of 2nd jet	g/s	4.38E-04	3.10E-04	2.20E-04	1.72E-04	1.44E-04	2.85E-04	6.21E-04	1.45E-03	2.41E-03	2.27E-03	1.93E-03	1.88E-03	1.63E-03	1.53E-03	1.63E-03	1.71E-03	1.90E-03	2.10E-03	2.24E-03	2.13E-03	1.59E-03	1.28E-03	1.15E-03	9.51E-04
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0008***	***0.0006***	***0.0009***	***0.0019***	***0.0053***	***0.0101***	***0.0095***	***0.0080***	***0.0078***	***0.0061***	***0.0056***	***0.0060***	***0.0063***	***0.0069***	***0.0077***	***0.0083***	***0.0081***	***0.0059***	***0.0045***	***0.0040***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.21E-03	9.51E-04	6.76E-04	5.04E-04	4.19E-04	5.81E-04	1.24E-03	3.52E-03	6.71E-03	6.31E-03	5.36E-03	5.18E-03	4.04E-03	3.72E-03	4.02E-03	4.21E-03	4.62E-03	5.13E-03	5.54E-03	5.38E-03	3.90E-03	2.97E-03	2.66E-03	2.23E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.05E-04	4.76E-04	3.38E-04	2.52E-04	2.09E-04	2.91E-04	6.21E-04	1.76E-03	3.35E-03	3.16E-03	2.68E-03	2.59E-03	2.02E-03	1.86E-03	2.01E-03	2.10E-03	2.31E-03	2.57E-03	2.77E-03	2.69E-03	1.95E-03	1.49E-03	1.33E-03	1.12E-03
	Emission in each Box of 1st jet	g/s	1.51E-04	1.19E-04	8.45E-05	6.30E-05	5.24E-05	7.27E-05	1.55E-04	4.40E-04	8.39E-04	7.89E-04	6.70E-04	6.47E-04	5.05E-04	4.66E-04	5.02E-04	5.26E-04	5.78E-04	6.42E-04	6.93E-04	6.73E-04	4.88E-04	3.71E-04	3.33E-04	2.79E-04
	Emission in each Box of 2nd jet	g/s	8.65E-05	6.80E-05	4.83E-05	3.60E-05	2.99E-05	4.15E-05	8.87E-05	2.51E-04	4.79E-04	4.51E-04	3.83E-04	3.70E-04	2.89E-04	2.66E-04	2.87E-04	3.01E-04	3.30E-04	3.67E-04	3.96E-04	3.84E-04	2.79E-04	2.12E-04	1.90E-04	1.59E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1690	0.1452	0.1462	0.1537	0.1561	0.2581	0.2723	0.2463	0.2730	0.2623	0.2523	0.2579	0.2421	0.2413	0.2502	0.2485	0.2595	0.2709	0.2709	0.2685	0.2424	0.2377	0.2300	0.2129
	NO2	g/vehicle/km	0.0333	0.0319	0.0322	0.0323	0.0325	0.0377	0.0389	0.0428	0.0543	0.0522	0.0500	0.0508	0.0428	0.0421	0.0440	0.0437	0.0451	0.0472	0.0479	0.0485	0.0425	0.0395	0.0379	0.0357
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0093***	***0.0065***	***0.0045***	***0.0035***	***0.0029***	***0.0058***	***0.0130***	***0.0297***	***0.0495***	***0.0461***	***0.0408***	***0.0399***	***0.0337***	***0.0315***	***0.0346***	***0.0360***	***0.0391***	***0.0440***	***0.0465***	***0.0442***	***0.0328***	***0.0265***	***0.0239***	***0.0195***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.17E-03	4.31E-03	2.99E-03	2.33E-03	1.96E-03	3.86E-03	8.70E-03	1.98E-02	3.30E-02	3.07E-02	2.72E-02	2.66E-02	2.25E-02	2.10E-02	2.30E-02	2.40E-02	2.61E-02	2.93E-02	3.10E-02	2.95E-02	2.19E-02	1.77E-02	1.60E-02	1.30E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.09E-03	2.15E-03	1.49E-03	1.17E-03	9.82E-04	1.93E-03	4.35E-03	9.89E-03	1.65E-02	1.54E-02	1.36E-02	1.33E-02	1.12E-02	1.05E-02	1.15E-02	1.20E-02	1.30E-02	1.47E-02	1.55E-02	1.47E-02	1.09E-02	8.84E-03	7.98E-03	6.49E-03
	Emission in each Box of 1st jet	g/s	7.71E-04	5.38E-04	3.73E-04	2.91E-04	2.46E-04	4.83E-04	1.09E-03	2.47E-03	4.12E-03	3.84E-03	3.40E-03	3.32E-03	2.81E-03	2.62E-03	2.88E-03	3.00E-03	3.26E-03	3.67E-03	3.87E-03	3.68E-03	2.74E-03	2.21E-03	2.00E-03	1.62E-03
	Emission in each Box of 2nd jet	g/s	4.41E-04	3.08E-04	2.13E-04	1.66E-04	1.40E-04	2.76E-04	6.21E-04	1.41E-03	2.36E-03	2.20E-03	1.94E-03	1.90E-03	1.60E-03	1.50E-03	1.65E-03	1.72E-03	1.86E-03	2.10E-03	2.21E-03	2.10E-03	1.56E-03	1.26E-03	1.14E-03	9.27E-04
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0008***	***0.0019***	***0.0052***	***0.0098***	***0.0092***	***0.0081***	***0.0079***	***0.0060***	***0.0055***	***0.0061***	***0.0063***	***0.0068***	***0.0077***	***0.0082***	***0.0080***	***0.0058***	***0.0044***	***0.0039***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.22E-03	9.46E-04	6.57E-04	4.90E-04	4.09E-04	5.64E-04	1.24E-03	3.44E-03	6.56E-03	6.12E-03	5.38E-03	5.24E-03	3.97E-03	3.66E-03	4.06E-03	4.22E-03	4.54E-03	5.11E-03	5.48E-03	5.32E-03	3.84E-03	2.94E-03	2.63E-03	2.18E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.09E-04	4.73E-04	3.28E-04	2.45E-04	2.05E-04	2.82E-04	6.21E-04	1.72E-03	3.28E-03	3.06E-03	2.69E-03	2.62E-03	1.98E-03	1.83E-03	2.03E-03	2.11E-03	2.27E-03	2.56E-03	2.74E-03	2.66E-03	1.92E-03	1.47E-03	1.32E-03	1.09E-03
	Emission in each Box of 1st jet	g/s	1.52E-04	1.18E-04	8.21E-05	6.12E-05	5.11E-05	7.05E-05	1.55E-04	4.30E-04	8.20E-04	7.64E-04	6.73E-04	6.55E-04	4.96E-04	4.58E-04	5.07E-04	5.28E-04	5.67E-04	6.39E-04	6.85E-04	6.65E-04	4.79E-04	3.67E-04	3.29E-04	2.72E-04
	Emission in each Box of 2nd jet	g/s	8.70E-05	6.76E-05	4.69E-05	3.50E-05	2.92E-05	4.03E-05	8.87E-05	2.46E-04	4.68E-04	4.37E-04	3.84E-04	3.74E-04	2.84E-04	2.62E-04	2.90E-04	3.02E-04	3.24E-04	3.65E-04	3.91E-04	3.80E-04	2.74E-04	2.10E-04	1.88E-04	1.56E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1712	0.1481	0.1491	0.1568	0.1593	0.2635	0.2777	0.2525	0.2763	0.2633	0.2563	0.2583	0.2467	0.2455	0.2489	0.2474	0.2659	0.2702	0.2787	0.2685	0.2425	0.2378	0.2302	0.2158
	NO2	g/vehicle/km	0.0337	0.0325	0.0328	0.0329	0.0331	0.0385	0.0396	0.0438	0.0549	0.0523	0.0507	0.0509	0.0436	0.0428	0.0439	0.0436	0.0463	0.0471	0.0493	0.0485	0.0425	0.0395	0.0380	0.0362
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0094***	***0.0066***	***0.0046***	***0.0036***	***0.0030***	***0.0059***	***0.0133***	***0.0304***	***0.0500***	***0.0463***	***0.0414***	***0.0399***	***0.0343***	***0.0320***	***0.0344***	***0.0359***	***0.0401***	***0.0439***	***0.0478***	***0.0442***	***0.0329***	***0.0265***	***0.0240***	***0.0197***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.25E-03	4.39E-03	3.04E-03	2.38E-03	2.00E-03	3.94E-03	8.87E-03	2.03E-02	3.34E-02	3.08E-02	2.76E-02	2.66E-02	2.29E-02	2.14E-02	2.29E-02	2.39E-02	2.67E-02	2.93E-02	3.19E-02	2.95E-02	2.19E-02	1.77E-02	1.60E-02	1.32E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.13E-03	2.20E-03	1.52E-03	1.19E-03	1.00E-03	1.97E-03	4.44E-03	1.01E-02	1.67E-02	1.54E-02	1.38E-02	1.33E-02	1.14E-02	1.07E-02	1.15E-02	1.20E-02	1.34E-02	1.46E-02	1.59E-02	1.47E-02	1.10E-02	8.85E-03	7.99E-03	6.58E-03
	Emission in each Box of 1st jet	g/s	7.81E-04	5.49E-04	3.81E-04	2.97E-04	2.51E-04	4.93E-04	1.11E-03	2.54E-03	4.17E-03	3.86E-03	3.45E-03	3.33E-03	2.86E-03	2.67E-03	2.87E-03	2.99E-03	3.34E-03	3.66E-03	3.98E-03	3.68E-03	2.74E-03	2.21E-03	2.00E-03	1.64E-03
	Emission in each Box of 2nd jet	g/s	4.47E-04	3.14E-04	2.17E-04	1.70E-04	1.43E-04	2.81E-04	6.34E-04	1.45E-03	2.38E-03	2.20E-03	1.97E-03	1.90E-03	1.63E-03	1.53E-03	1.64E-03	1.71E-03	1.91E-03	2.09E-03	2.28E-03	2.10E-03	1.56E-03	1.26E-03	1.14E-03	9.40E-04
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0009***	***0.0019***	***0.0053***	***0.0099***	***0.0092***	***0.0082***	***0.0079***	***0.0061***	***0.0056***	***0.0061***	***0.0063***	***0.0070***	***0.0076***	***0.0085***	***0.0080***	***0.0058***	***0.0044***	***0.0040***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.23E-03	9.64E-04	6.69E-04	4.99E-04	4.17E-04	5.75E-04	1.26E-03	3.52E-03	6.63E-03	6.13E-03	5.46E-03	5.25E-03	4.04E-03	3.72E-03	4.04E-03	4.21E-03	4.65E-03	5.10E-03	5.64E-03	5.32E-03	3.84E-03	2.94E-03	2.63E-03	2.21E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.16E-04	4.82E-04	3.34E-04	2.49E-04	2.08E-04	2.88E-04	6.32E-04	1.76E-03	3.32E-03	3.07E-03	2.73E-03	2.62E-03	2.02E-03	1.86E-03	2.02E-03	2.10E-03	2.33E-03	2.55E-03	2.82E-03	2.66E-03	1.92E-03	1.47E-03	1.32E-03	1.10E-03
	Emission in each Box of 1st jet	g/s	1.54E-04	1.20E-04	8.36E-05	6.24E-05	5.21E-05	7.19E-05	1.58E-04	4.40E-04	8.29E-04	7.66E-04	6.83E-04	6.56E-04	5.05E-04	4.66E-04	5.05E-04	5.26E-04	5.81E-04	6.37E-04	7.05E-04	6.65E-04	4.80E-04	3.67E-04	3.29E-04	2.76E-04
	Emission in each Box of 2nd jet	g/s	8.80E-05	6.88E-05	4.78E-05	3.56E-05	2.98E-05	4.11E-05	9.03E-05	2.51E-04	4.74E-04	4.38E-04	3.90E-04	3.75E-04	2.89E-04	2.66E-04	2.89E-04	3.01E-04	3.32E-04	3.64E-04	4.03E-04	3.80E-04	2.74E-04	2.10E-04	1.88E-04	1.58E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1700	0.1470	0.1480	0.1546	0.1620	0.2678	0.2808	0.2494	0.2786	0.2661	0.2594	0.2580	0.2495	0.2519	0.2536	0.2537	0.2631	0.2691	0.2773	0.2653	0.2497	0.2434	0.2357	0.2210
	NO2	g/vehicle/km	0.0335	0.0323	0.0325	0.0325	0.0336	0.0391	0.0400	0.0433	0.0553	0.0529	0.0513	0.0508	0.0441	0.0439	0.0447	0.0446	0.0458	0.0469	0.0490	0.0479	0.0437	0.0404	0.0388	0.0370
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0093***	***0.0065***	***0.0045***	***0.0035***	***0.0031***	***0.0060***	***0.0135***	***0.0301***	***0.0505***	***0.0468***	***0.0419***	***0.0399***	***0.0347***	***0.0329***	***0.0350***	***0.0368***	***0.0397***	***0.0437***	***0.0476***	***0.0437***	***0.0338***	***0.0272***	***0.0245***	***0.0202***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.21E-03	4.36E-03	3.02E-03	2.35E-03	2.04E-03	4.01E-03	8.97E-03	2.00E-02	3.36E-02	3.12E-02	2.79E-02	2.66E-02	2.31E-02	2.19E-02	2.34E-02	2.45E-02	2.64E-02	2.91E-02	3.17E-02	2.91E-02	2.26E-02	1.81E-02	1.64E-02	1.35E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.10E-03	2.18E-03	1.51E-03	1.17E-03	1.02E-03	2.00E-03	4.48E-03	1.00E-02	1.68E-02	1.56E-02	1.40E-02	1.33E-02	1.16E-02	1.10E-02	1.17E-02	1.23E-02	1.32E-02	1.46E-02	1.59E-02	1.46E-02	1.13E-02	9.06E-03	8.18E-03	6.74E-03
	Emission in each Box of 1st jet	g/s	7.76E-04	5.45E-04	3.78E-04	2.93E-04	2.55E-04	5.01E-04	1.12E-03	2.50E-03	4.20E-03	3.90E-03	3.49E-03	3.32E-03	2.89E-03	2.74E-03	2.92E-03	3.06E-03	3.31E-03	3.64E-03	3.96E-03	3.64E-03	2.82E-03	2.26E-03	2.04E-03	1.68E-03
	Emission in each Box of 2nd jet	g/s	4.43E-04	3.11E-04	2.16E-04	1.68E-04	1.46E-04	2.86E-04	6.41E-04	1.43E-03	2.40E-03	2.23E-03	2.00E-03	1.90E-03	1.65E-03	1.57E-03	1.67E-03	1.75E-03	1.89E-03	2.08E-03	2.27E-03	2.08E-03	1.61E-03	1.29E-03	1.17E-03	9.62E-04
NO_2 Emission Rate		g/s	***0.0018***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0009***	***0.0019***	***0.0052***	***0.0100***	***0.0093***	***0.0083***	***0.0078***	***0.0061***	***0.0057***	***0.0062***	***0.0065***	***0.0069***	***0.0076***	***0.0084***	***0.0079***	***0.0059***	***0.0045***	***0.0040***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.22E-03	9.57E-04	6.64E-04	4.92E-04	4.23E-04	5.84E-04	1.28E-03	3.48E-03	6.68E-03	6.20E-03	5.52E-03	5.23E-03	4.09E-03	3.82E-03	4.11E-03	4.31E-03	4.60E-03	5.08E-03	5.61E-03	5.26E-03	3.94E-03	3.00E-03	2.69E-03	2.25E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.12E-04	4.78E-04	3.32E-04	2.46E-04	2.12E-04	2.92E-04	6.39E-04	1.74E-03	3.34E-03	3.10E-03	2.76E-03	2.62E-03	2.04E-03	1.91E-03	2.06E-03	2.16E-03	2.30E-03	2.54E-03	2.80E-03	2.63E-03	1.97E-03	1.50E-03	1.35E-03	1.13E-03
	Emission in each Box of 1st jet	g/s	1.53E-04	1.20E-04	8.30E-05	6.15E-05	5.29E-05	7.30E-05	1.60E-04	4.35E-04	8.35E-04	7.75E-04	6.90E-04	6.54E-04	5.11E-04	4.77E-04	5.14E-04	5.39E-04	5.75E-04	6.35E-04	7.01E-04	6.57E-04	4.93E-04	3.75E-04	3.37E-04	2.82E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	6.83E-05	4.74E-05	3.52E-05	3.02E-05	4.17E-05	9.13E-05	2.48E-04	4.77E-04	4.43E-04	3.94E-04	3.74E-04	2.92E-04	2.73E-04	2.94E-04	3.08E-04	3.29E-04	3.63E-04	4.01E-04	3.75E-04	2.82E-04	2.15E-04	1.92E-04	1.61E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involved	086P2
Road Located	086
Vehicle EF Adopted	086

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1917	0.1670	0.1675	0.1765	0.1785	0.2959	0.3114	0.2859	0.3154	0.3012	0.2824	0.2874	0.2798	0.2766	0.2805	0.2791	0.2932	0.2993	0.3103	0.3012	0.2755	0.2701	0.2618	0.2444
	NO2	g/vehicle/km	0.0375	0.0363	0.0365	0.0367	0.0368	0.0429	0.0441	0.0493	0.0623	0.0596	0.0557	0.0564	0.0491	0.0479	0.0491	0.0488	0.0508	0.0520	0.0546	0.0541	0.0479	0.0445	0.0429	0.0407
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0105***	***0.0074***	***0.0051***	***0.0040***	***0.0034***	***0.0066***	***0.0149***	***0.0345***	***0.0571***	***0.0529***	***0.0456***	***0.0444***	***0.0389***	***0.0361***	***0.0388***	***0.0405***	***0.0442***	***0.0486***	***0.0532***	***0.0496***	***0.0373***	***0.0301***	***0.0273***	***0.0223***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.00E-03	4.95E-03	3.42E-03	2.68E-03	2.25E-03	4.43E-03	9.95E-03	2.30E-02	3.81E-02	3.53E-02	3.04E-02	2.96E-02	2.60E-02	2.41E-02	2.58E-02	2.70E-02	2.95E-02	3.24E-02	3.55E-02	3.31E-02	2.49E-02	2.01E-02	1.82E-02	1.49E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.50E-03	2.48E-03	1.71E-03	1.34E-03	1.12E-03	2.21E-03	4.97E-03	1.15E-02	1.90E-02	1.76E-02	1.52E-02	1.48E-02	1.30E-02	1.20E-02	1.29E-02	1.35E-02	1.47E-02	1.62E-02	1.77E-02	1.65E-02	1.24E-02	1.00E-02	9.09E-03	7.45E-03
	Emission in each Box of 1st jet	g/s	8.75E-04	6.19E-04	4.28E-04	3.35E-04	2.81E-04	5.53E-04	1.24E-03	2.87E-03	4.76E-03	4.41E-03	3.80E-03	3.70E-03	3.24E-03	3.01E-03	3.23E-03	3.37E-03	3.68E-03	4.05E-03	4.44E-03	4.13E-03	3.11E-03	2.51E-03	2.27E-03	1.86E-03
	Emission in each Box of 2nd jet	g/s	5.00E-04	3.54E-04	2.44E-04	1.91E-04	1.60E-04	3.16E-04	7.11E-04	1.64E-03	2.72E-03	2.52E-03	2.17E-03	2.12E-03	1.85E-03	1.72E-03	1.85E-03	1.93E-03	2.11E-03	2.31E-03	2.54E-03	2.36E-03	1.78E-03	1.44E-03	1.30E-03	1.06E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0016***	***0.0011***	***0.0008***	***0.0007***	***0.0010***	***0.0021***	***0.0059***	***0.0113***	***0.0105***	***0.0090***	***0.0087***	***0.0068***	***0.0063***	***0.0068***	***0.0071***	***0.0077***	***0.0084***	***0.0094***	***0.0089***	***0.0065***	***0.0050***	***0.0045***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.37E-03	1.08E-03	7.45E-04	5.56E-04	4.63E-04	6.42E-04	1.41E-03	3.96E-03	7.52E-03	6.98E-03	6.00E-03	5.81E-03	4.55E-03	4.17E-03	4.52E-03	4.72E-03	5.11E-03	5.63E-03	6.24E-03	5.94E-03	4.33E-03	3.31E-03	2.97E-03	2.48E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.85E-04	5.39E-04	3.72E-04	2.78E-04	2.31E-04	3.21E-04	7.05E-04	1.98E-03	3.76E-03	3.49E-03	3.00E-03	2.90E-03	2.28E-03	2.08E-03	2.26E-03	2.36E-03	2.55E-03	2.81E-03	3.12E-03	2.97E-03	2.16E-03	1.66E-03	1.49E-03	1.24E-03
	Emission in each Box of 1st jet	g/s	1.71E-04	1.35E-04	9.31E-05	6.95E-05	5.78E-05	8.03E-05	1.76E-04	4.95E-04	9.41E-04	8.72E-04	7.50E-04	7.26E-04	5.69E-04	5.21E-04	5.65E-04	5.90E-04	6.38E-04	7.03E-04	7.80E-04	7.42E-04	5.41E-04	4.14E-04	3.72E-04	3.10E-04
	Emission in each Box of 2nd jet	g/s	9.79E-05	7.69E-05	5.32E-05	3.97E-05	3.31E-05	4.59E-05	1.01E-04	2.83E-04	5.37E-04	4.98E-04	4.28E-04	4.15E-04	3.25E-04	2.98E-04	3.23E-04	3.37E-04	3.65E-04	4.02E-04	4.46E-04	4.24E-04	3.09E-04	2.37E-04	2.12E-04	1.77E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2101	0.1853	0.1862	0.1982	0.2013	0.3334	0.3503	0.3208	0.3548	0.3398	0.3187	0.3224	0.3098	0.3064	0.3106	0.3094	0.3233	0.3358	0.3413	0.3362	0.3057	0.2999	0.2910	0.2728
	NO2	g/vehicle/km	0.0409	0.0400	0.0402	0.0408	0.0411	0.0481	0.0493	0.0550	0.0697	0.0668	0.0625	0.0629	0.0542	0.0529	0.0542	0.0539	0.0557	0.0579	0.0597	0.0600	0.0529	0.0491	0.0473	0.0451
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0115***	***0.0082***	***0.0057***	***0.0045***	***0.0038***	***0.0075***	***0.0168***	***0.0387***	***0.0643***	***0.0597***	***0.0515***	***0.0499***	***0.0431***	***0.0400***	***0.0429***	***0.0449***	***0.0487***	***0.0545***	***0.0585***	***0.0553***	***0.0414***	***0.0335***	***0.0303***	***0.0250***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.67E-03	5.50E-03	3.80E-03	3.01E-03	2.53E-03	4.99E-03	1.12E-02	2.58E-02	4.28E-02	3.98E-02	3.43E-02	3.32E-02	2.87E-02	2.67E-02	2.86E-02	2.99E-02	3.25E-02	3.63E-02	3.90E-02	3.69E-02	2.76E-02	2.23E-02	2.02E-02	1.66E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.84E-03	2.75E-03	1.90E-03	1.50E-03	1.27E-03	2.49E-03	5.60E-03	1.29E-02	2.14E-02	1.99E-02	1.72E-02	1.66E-02	1.44E-02	1.33E-02	1.43E-02	1.50E-02	1.62E-02	1.82E-02	1.95E-02	1.84E-02	1.38E-02	1.12E-02	1.01E-02	8.32E-03
	Emission in each Box of 1st jet	g/s	9.59E-04	6.87E-04	4.75E-04	3.76E-04	3.17E-04	6.23E-04	1.40E-03	3.22E-03	5.36E-03	4.98E-03	4.29E-03	4.16E-03	3.59E-03	3.33E-03	3.58E-03	3.74E-03	4.06E-03	4.54E-03	4.88E-03	4.61E-03	3.45E-03	2.79E-03	2.52E-03	2.08E-03
	Emission in each Box of 2nd jet	g/s	5.48E-04	3.93E-04	2.72E-04	2.15E-04	1.81E-04	3.56E-04	7.99E-04	1.84E-03	3.06E-03	2.84E-03	2.45E-03	2.37E-03	2.05E-03	1.90E-03	2.04E-03	2.14E-03	2.32E-03	2.60E-03	2.79E-03	2.64E-03	1.97E-03	1.59E-03	1.44E-03	1.19E-03
NO_2 Emission Rate		g/s	***0.0022***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0024***	***0.0066***	***0.0126***	***0.0117***	***0.0101***	***0.0097***	***0.0075***	***0.0069***	***0.0075***	***0.0078***	***0.0084***	***0.0094***	***0.0102***	***0.0099***	***0.0072***	***0.0055***	***0.0049***	***0.0041***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.49E-03	1.19E-03	8.22E-04	6.19E-04	5.17E-04	7.19E-04	1.58E-03	4.42E-03	8.42E-03	7.83E-03	6.73E-03	6.48E-03	5.02E-03	4.60E-03	4.99E-03	5.21E-03	5.60E-03	6.27E-03	6.83E-03	6.58E-03	4.78E-03	3.65E-03	3.28E-03	2.75E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.47E-04	5.93E-04	4.11E-04	3.09E-04	2.59E-04	3.60E-04	7.88E-04	2.21E-03	4.21E-03	3.91E-03	3.36E-03	3.24E-03	2.51E-03	2.30E-03	2.49E-03	2.61E-03	2.80E-03	3.14E-03	3.42E-03	3.29E-03	2.39E-03	1.83E-03	1.64E-03	1.38E-03
	Emission in each Box of 1st jet	g/s	1.87E-04	1.48E-04	1.03E-04	7.74E-05	6.46E-05	8.99E-05	1.97E-04	5.52E-04	1.05E-03	9.78E-04	8.41E-04	8.10E-04	6.28E-04	5.75E-04	6.24E-04	6.51E-04	7.00E-04	7.84E-04	8.54E-04	8.23E-04	5.97E-04	4.57E-04	4.11E-04	3.44E-04
	Emission in each Box of 2nd jet	g/s	1.07E-04	8.48E-05	5.87E-05	4.42E-05	3.69E-05	5.14E-05	1.13E-04	3.16E-04	6.01E-04	5.59E-04	4.81E-04	4.63E-04	3.59E-04	3.29E-04	3.56E-04	3.72E-04	4.00E-04	4.48E-04	4.88E-04	4.70E-04	3.41E-04	2.61E-04	2.35E-04	1.96E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	086B01-086B15
Enclosure Involvec	086P2
Road Located	086
Vehicle EF Adopte	086

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	862	700	482	358	297	353	754	1896	2850	2765	2542	2433	2189	2053	2174	2281	2372	2555	2699	2590	2132	1756	1638	1439
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.2216	0.1940	0.1951	0.2064	0.2121	0.3492	0.3657	0.3346	0.3696	0.3537	0.3308	0.3353	0.3216	0.3181	0.3234	0.3216	0.3357	0.3477	0.3569	0.3472	0.3171	0.3102	0.3049	0.2858
	NO2	g/vehicle/km	0.0429	0.0415	0.0418	0.0422	0.0429	0.0501	0.0513	0.0571	0.0723	0.0693	0.0646	0.0652	0.0560	0.0547	0.0562	0.0559	0.0577	0.0598	0.0622	0.0618	0.0546	0.0506	0.0493	0.0470
	RSP	g/vehicle/km	0.0126	0.0107	0.0108	0.0114	0.0118	0.0209	0.0220	0.0182	0.0178	0.0172	0.0167	0.0169	0.0178	0.0178	0.0178	0.0178	0.0180	0.0184	0.0186	0.0180	0.0175	0.0178	0.0175	0.0164
	FSP	g/vehicle/km	0.0116	0.0098	0.0099	0.0105	0.0108	0.0192	0.0202	0.0168	0.0164	0.0158	0.0154	0.0155	0.0164	0.0164	0.0164	0.0164	0.0165	0.0169	0.0171	0.0166	0.0161	0.0164	0.0161	0.0151
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	Length of Tunnel	m	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81	228.81
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0121***	***0.0086***	***0.0060***	***0.0047***	***0.0040***	***0.0078***	***0.0175***	***0.0403***	***0.0670***	***0.0622***	***0.0534***	***0.0518***	***0.0447***	***0.0415***	***0.0447***	***0.0466***	***0.0506***	***0.0565***	***0.0612***	***0.0572***	***0.0430***	***0.0346***	***0.0317***	***0.0261***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.09E-03	5.75E-03	3.98E-03	3.13E-03	2.67E-03	5.22E-03	1.17E-02	2.69E-02	4.46E-02	4.14E-02	3.56E-02	3.46E-02	2.98E-02	2.77E-02	2.98E-02	3.11E-02	3.37E-02	3.76E-02	4.08E-02	3.81E-02	2.86E-02	2.31E-02	2.12E-02	1.74E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.05E-03	2.88E-03	1.99E-03	1.57E-03	1.33E-03	2.61E-03	5.84E-03	1.34E-02	2.23E-02	2.07E-02	1.78E-02	1.73E-02	1.49E-02	1.38E-02	1.49E-02	1.55E-02	1.69E-02	1.88E-02	2.04E-02	1.91E-02	1.43E-02	1.15E-02	1.06E-02	8.71E-03
	Emission in each Box of 1st jet	g/s	1.01E-03	7.19E-04	4.98E-04	3.91E-04	3.34E-04	6.53E-04	1.46E-03	3.36E-03	5.58E-03	5.18E-03	4.45E-03	4.32E-03	3.73E-03	3.46E-03	3.72E-03	3.88E-03	4.22E-03	4.70E-03	5.10E-03	4.76E-03	3.58E-03	2.88E-03	2.64E-03	2.18E-03
	Emission in each Box of 2nd jet	g/s	5.78E-04	4.11E-04	2.85E-04	2.24E-04	1.91E-04	3.73E-04	8.34E-04	1.92E-03	3.19E-03	2.96E-03	2.55E-03	2.47E-03	2.13E-03	1.98E-03	2.13E-03	2.22E-03	2.41E-03	2.69E-03	2.92E-03	2.72E-03	2.05E-03	1.65E-03	1.51E-03	1.24E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0013***	***0.0010***	***0.0008***	***0.0011***	***0.0025***	***0.0069***	***0.0131***	***0.0122***	***0.0104***	***0.0101***	***0.0078***	***0.0071***	***0.0078***	***0.0081***	***0.0087***	***0.0097***	***0.0107***	***0.0102***	***0.0074***	***0.0057***	***0.0051***	***0.0043***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.57E-03	1.23E-03	8.54E-04	6.40E-04	5.40E-04	7.49E-04	1.64E-03	4.59E-03	8.73E-03	8.11E-03	6.96E-03	6.72E-03	5.20E-03	4.76E-03	5.18E-03	5.40E-03	5.80E-03	6.47E-03	7.12E-03	6.78E-03	4.93E-03	3.77E-03	3.42E-03	2.87E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.83E-04	6.16E-04	4.27E-04	3.20E-04	2.70E-04	3.75E-04	8.19E-04	2.29E-03	4.37E-03	4.06E-03	3.48E-03	3.36E-03	2.60E-03	2.38E-03	2.59E-03	2.70E-03	2.90E-03	3.24E-03	3.56E-03	3.39E-03	2.47E-03	1.88E-03	1.71E-03	1.43E-03
	Emission in each Box of 1st jet	g/s	1.96E-04	1.54E-04	1.07E-04	8.00E-05	6.76E-05	9.37E-05	2.05E-04	5.73E-04	1.09E-03	1.01E-03	8.70E-04	8.41E-04	6.50E-04	5.95E-04	6.47E-04	6.75E-04	7.24E-04	8.09E-04	8.90E-04	8.47E-04	6.17E-04	4.71E-04	4.28E-04	3.58E-04
	Emission in each Box of 2nd jet	g/s	1.12E-04	8.80E-05	6.10E-05	4.57E-05	3.86E-05	5.35E-05	1.17E-04	3.28E-04	6.24E-04	5.80E-04	4.97E-04	4.80E-04	3.71E-04	3.40E-04	3.70E-04	3.86E-04	4.14E-04	4.62E-04	5.08E-04	4.84E-04	3.52E-04	2.69E-04	2.45E-04	2.05E-04
RSP Emission Rate		g/s	***6.91E-04***	***4.75E-04***	***3.30E-04***	***2.60E-04***	***2.22E-04***	***4.69E-04***	***1.05E-03***	***2.20E-03***	***3.22E-03***	***3.03E-03***	***2.70E-03***	***2.62E-03***	***2.48E-03***	***2.33E-03***	***2.47E-03***	***2.59E-03***	***2.71E-03***	***2.99E-03***	***3.18E-03***	***2.97E-03***	***2.37E-03***	***1.98E-03***	***1.82E-03***	***1.50E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	4.60E-04	3.17E-04	2.20E-04	1.74E-04	1.48E-04	3.13E-04	7.03E-04	1.46E-03	2.15E-03	2.02E-03	1.80E-03	1.74E-03	1.65E-03	1.55E-03	1.64E-03	1.72E-03	1.81E-03	1.99E-03	2.12E-03	1.98E-03	1.58E-03	1.32E-03	1.21E-03	1.00E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.30E-04	1.58E-04	1.10E-04	8.68E-05	7.40E-05	1.56E-04	3.52E-04	7.32E-04	1.07E-03	1.01E-03	9.01E-04	8.72E-04	8.25E-04	7.76E-04	8.22E-04	8.62E-04	9.04E-04	9.96E-04	1.06E-03	9.89E-04	7.89E-04	6.61E-04	6.06E-04	5.00E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.96E-05	2.75E-05	2.17E-05	1.85E-05	3.91E-05	8.79E-05	1.83E-04	2.68E-04	2.52E-04	2.25E-04	2.18E-04	2.06E-04	1.94E-04	2.05E-04	2.16E-04	2.26E-04	2.49E-04	2.65E-04	2.47E-04	1.97E-04	1.65E-04	1.51E-04	1.25E-04
	Emission in each Box of 2nd jet	g/s	3.29E-05	2.26E-05	1.57E-05	1.24E-05	1.06E-05	2.23E-05	5.02E-05	1.05E-04	1.53E-04	1.44E-04	1.29E-04	1.25E-04	1.18E-04	1.11E-04	1.17E-04	1.23E-04	1.29E-04	1.42E-04	1.52E-04	1.41E-04	1.13E-04	9.44E-05	8.65E-05	7.15E-05
FSP Emission Rate		g/s	***6.35E-04***	***4.37E-04***	***3.04E-04***	***2.39E-04***	***2.04E-04***	***4.31E-04***	***9.70E-04***	***2.02E-03***	***2.97E-03***	***2.78E-03***	***2.49E-03***	***2.40E-03***	***2.28E-03***	***2.14E-03***	***2.27E-03***	***2.38E-03***	***2.49E-03***	***2.75E-03***	***2.93E-03***	***2.73E-03***	***2.18E-03***	***1.83E-03***	***1.67E-03***	***1.38E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.23E-04	2.91E-04	2.02E-04	1.60E-04	1.36E-04	2.88E-04	6.47E-04	1.35E-03	1.98E-03	1.85E-03	1.66E-03	1.60E-03	1.52E-03	1.43E-03	1.51E-03	1.59E-03	1.66E-03	1.83E-03	1.95E-03	1.82E-03	1.45E-03	1.22E-03	1.12E-03	9.23E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.12E-04	1.46E-04	1.01E-04	7.98E-05	6.81E-05	1.44E-04	3.23E-04	6.74E-04	9.89E-04	9.25E-04	8.29E-04	8.02E-04	7.59E-04	7.13E-04	7.56E-04	7.93E-04	8.32E-04	9.16E-04	9.76E-04	9.10E-04	7.25E-04	6.09E-04	5.58E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	5.29E-05	3.64E-05	2.53E-05	2.00E-05	1.70E-05	3.59E-05	8.08E-05	1.69E-04	2.47E-04	2.31E-04	2.07E-04	2.00E-04	1.90E-04	1.78E-04	1.89E-04	1.98E-04	2.08E-04	2.29E-04	2.44E-04	2.28E-04	1.81E-04	1.52E-04	1.39E-04	1.15E-04
	Emission in each Box of 2nd jet	g/s	3.02E-05	2.08E-05	1.45E-05	1.14E-05	9.72E-06	2.05E-05	4.62E-05	9.63E-05	1.41E-04	1.32E-04	1.18E-04	1.15E-04	1.08E-04	1.02E-04	1.08E-04	1.13E-04	1.19E-04	1.31E-04	1.39E-04	1.30E-04	1.04E-04	8.69E-05	7.97E-05	6.59E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535	3.535

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1303	0.1126	0.1143	0.1216	0.1233	0.2145	0.2272	0.1690	0.1689	0.1646	0.1572	0.1538	0.1982	0.1936	0.1962	0.2030	0.2081	0.2199	0.2314	0.2167	0.1916	0.1888	0.1877	0.1793
	NO2	g/vehicle/km	0.0226	0.0218	0.0223	0.0227	0.0228	0.0277	0.0284	0.0252	0.0303	0.0296	0.0279	0.0269	0.0335	0.0317	0.0331	0.0346	0.0355	0.0377	0.0404	0.0382	0.0319	0.0289	0.0283	0.0274
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0079***	***0.0056***	***0.0039***	***0.0031***	***0.0026***	***0.0052***	***0.0118***	***0.0224***	***0.0340***	***0.0321***	***0.0282***	***0.0264***	***0.0375***	***0.0343***	***0.0369***	***0.0401***	***0.0428***	***0.0488***	***0.0542***	***0.0487***	***0.0354***	***0.0286***	***0.0266***	***0.0224***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.29E-03	3.73E-03	2.61E-03	2.05E-03	1.72E-03	3.48E-03	7.87E-03	1.50E-02	2.26E-02	2.14E-02	1.88E-02	1.76E-02	2.50E-02	2.29E-02	2.46E-02	2.67E-02	2.85E-02	3.25E-02	3.61E-02	3.25E-02	2.36E-02	1.91E-02	1.77E-02	1.49E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.65E-03	1.86E-03	1.30E-03	1.02E-03	8.62E-04	1.74E-03	3.93E-03	7.48E-03	1.13E-02	1.07E-02	9.41E-03	8.80E-03	1.25E-02	1.14E-02	1.23E-02	1.34E-02	1.43E-02	1.63E-02	1.81E-02	1.62E-02	1.18E-02	9.54E-03	8.86E-03	7.45E-03
	Emission in each Box of 1st jet	g/s	1.06E-03	7.46E-04	5.21E-04	4.10E-04	3.45E-04	6.96E-04	1.57E-03	2.99E-03	4.53E-03	4.28E-03	3.76E-03	3.52E-03	5.00E-03	4.58E-03	4.92E-03	5.34E-03	5.71E-03	6.50E-03	7.23E-03	6.49E-03	4.72E-03	3.82E-03	3.54E-03	2.98E-03
	Emission in each Box of 2nd jet	g/s	8.82E-04	6.22E-04	4.34E-04	3.41E-04	2.87E-04	5.80E-04	1.31E-03	2.49E-03	3.77E-03	3.57E-03	3.14E-03	2.93E-03	4.17E-03	3.82E-03	4.10E-03	4.45E-03	4.76E-03	5.42E-03	6.02E-03	5.41E-03	3.93E-03	3.18E-03	2.95E-03	2.48E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0007***	***0.0015***	***0.0033***	***0.0061***	***0.0058***	***0.0050***	***0.0046***	***0.0063***	***0.0056***	***0.0062***	***0.0068***	***0.0073***	***0.0084***	***0.0095***	***0.0086***	***0.0059***	***0.0044***	***0.0040***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.16E-04	7.23E-04	5.08E-04	3.82E-04	3.19E-04	4.49E-04	9.83E-04	2.23E-03	4.06E-03	3.85E-03	3.34E-03	3.07E-03	4.22E-03	3.75E-03	4.16E-03	4.56E-03	4.87E-03	5.58E-03	6.31E-03	5.73E-03	3.92E-03	2.92E-03	2.67E-03	2.28E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.58E-04	3.61E-04	2.54E-04	1.91E-04	1.59E-04	2.24E-04	4.92E-04	1.12E-03	2.03E-03	1.92E-03	1.67E-03	1.54E-03	2.11E-03	1.87E-03	2.08E-03	2.28E-03	2.43E-03	2.79E-03	3.15E-03	2.86E-03	1.96E-03	1.46E-03	1.33E-03	1.14E-03
	Emission in each Box of 1st jet	g/s	1.83E-04	1.45E-04	1.02E-04	7.64E-05	6.37E-05	8.98E-05	1.97E-04	4.46E-04	8.12E-04	7.70E-04	6.67E-04	6.15E-04	8.45E-04	7.49E-04	8.31E-04	9.11E-04	9.74E-04	1.12E-03	1.26E-03	1.15E-03	7.85E-04	5.85E-04	5.34E-04	4.56E-04
	Emission in each Box of 2nd jet	g/s	1.53E-04	1.20E-04	8.47E-05	6.36E-05	5.31E-05	7.48E-05	1.64E-04	3.72E-04	6.77E-04	6.41E-04	5.56E-04	5.12E-04	7.04E-04	6.24E-04	6.93E-04	7.59E-04	8.12E-04	9.30E-04	1.05E-03	9.54E-04	6.54E-04	4.87E-04	4.45E-04	3.80E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1213	0.1036	0.1049	0.1132	0.1146	0.2001	0.2099	0.1576	0.1557	0.1498	0.1442	0.1412	0.1824	0.1794	0.1834	0.1881	0.1925	0.2045	0.2150	0.2029	0.1792	0.1770	0.1739	0.1660
	NO2	g/vehicle/km	0.0212	0.0204	0.0208	0.0214	0.0214	0.0260	0.0265	0.0237	0.0283	0.0273	0.0259	0.0249	0.0310	0.0296	0.0312	0.0323	0.0331	0.0354	0.0379	0.0360	0.0300	0.0273	0.0264	0.0256
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0074***	***0.0051***	***0.0036***	***0.0029***	***0.0024***	***0.0049***	***0.0109***	***0.0209***	***0.0313***	***0.0292***	***0.0259***	***0.0242***	***0.0345***	***0.0318***	***0.0345***	***0.0371***	***0.0396***	***0.0453***	***0.0504***	***0.0456***	***0.0331***	***0.0268***	***0.0246***	***0.0207***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.93E-03	3.43E-03	2.39E-03	1.91E-03	1.60E-03	3.25E-03	7.27E-03	1.39E-02	2.09E-02	1.95E-02	1.73E-02	1.62E-02	2.30E-02	2.12E-02	2.30E-02	2.48E-02	2.64E-02	3.02E-02	3.36E-02	3.04E-02	2.21E-02	1.79E-02	1.64E-02	1.38E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.46E-03	1.72E-03	1.20E-03	9.53E-04	8.02E-04	1.62E-03	3.63E-03	6.97E-03	1.04E-02	9.75E-03	8.63E-03	8.08E-03	1.15E-02	1.06E-02	1.15E-02	1.24E-02	1.32E-02	1.51E-02	1.68E-02	1.52E-02	1.10E-02	8.94E-03	8.20E-03	6.90E-03
	Emission in each Box of 1st jet	g/s	9.85E-04	6.87E-04	4.79E-04	3.81E-04	3.21E-04	6.49E-04	1.45E-03	2.79E-03	4.18E-03	3.90E-03	3.45E-03	3.23E-03	4.60E-03	4.25E-03	4.60E-03	4.95E-03	5.28E-03	6.05E-03	6.71E-03	6.08E-03	4.41E-03	3.58E-03	3.28E-03	2.76E-03
	Emission in each Box of 2nd jet	g/s	8.21E-04	5.72E-04	3.99E-04	3.18E-04	2.67E-04	5.41E-04	1.21E-03	2.32E-03	3.48E-03	3.25E-03	2.88E-03	2.69E-03	3.84E-03	3.54E-03	3.84E-03	4.13E-03	4.40E-03	5.04E-03	5.59E-03	5.07E-03	3.68E-03	2.98E-03	2.73E-03	2.30E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0014***	***0.0031***	***0.0057***	***0.0053***	***0.0046***	***0.0043***	***0.0059***	***0.0053***	***0.0059***	***0.0064***	***0.0068***	***0.0079***	***0.0089***	***0.0081***	***0.0055***	***0.0041***	***0.0037***	***0.0032***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.62E-04	6.76E-04	4.74E-04	3.60E-04	3.00E-04	4.22E-04	9.16E-04	2.10E-03	3.79E-03	3.55E-03	3.09E-03	2.85E-03	3.91E-03	3.50E-03	3.91E-03	4.25E-03	4.54E-03	5.23E-03	5.92E-03	5.39E-03	3.70E-03	2.76E-03	2.49E-03	2.13E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.31E-04	3.38E-04	2.37E-04	1.80E-04	1.50E-04	2.11E-04	4.58E-04	1.05E-03	1.89E-03	1.78E-03	1.55E-03	1.42E-03	1.96E-03	1.75E-03	1.96E-03	2.13E-03	2.27E-03	2.62E-03	2.96E-03	2.70E-03	1.85E-03	1.38E-03	1.25E-03	1.06E-03
	Emission in each Box of 1st jet	g/s	1.72E-04	1.35E-04	9.49E-05	7.19E-05	5.99E-05	8.43E-05	1.83E-04	4.20E-04	7.58E-04	7.10E-04	6.19E-04	5.70E-04	7.83E-04	7.00E-04	7.83E-04	8.51E-04	9.08E-04	1.05E-03	1.18E-03	1.08E-03	7.40E-04	5.52E-04	4.99E-04	4.25E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	1.13E-04	7.90E-05	6.00E-05	4.99E-05	7.03E-05	1.53E-04	3.50E-04	6.32E-04	5.92E-04	5.16E-04	4.75E-04	6.52E-04	5.83E-04	6.52E-04	7.09E-04	7.57E-04	8.72E-04	9.86E-04	8.99E-04	6.16E-04	4.60E-04	4.16E-04	3.54E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1142	0.0976	0.0990	0.1052	0.1065	0.1870	0.1967	0.1478	0.1464	0.1423	0.1354	0.1344	0.1738	0.1683	0.1721	0.1787	0.1809	0.1932	0.2046	0.1912	0.1683	0.1661	0.1632	0.1562
	NO2	g/vehicle/km	0.0201	0.0194	0.0198	0.0201	0.0201	0.0245	0.0250	0.0224	0.0267	0.0260	0.0244	0.0238	0.0297	0.0279	0.0294	0.0308	0.0312	0.0336	0.0362	0.0342	0.0284	0.0258	0.0249	0.0242
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0070***	***0.0048***	***0.0034***	***0.0027***	***0.0022***	***0.0046***	***0.0102***	***0.0196***	***0.0294***	***0.0278***	***0.0243***	***0.0231***	***0.0329***	***0.0299***	***0.0324***	***0.0353***	***0.0372***	***0.0428***	***0.0479***	***0.0430***	***0.0311***	***0.0252***	***0.0231***	***0.0195***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.63E-03	3.23E-03	2.26E-03	1.77E-03	1.49E-03	3.03E-03	6.81E-03	1.31E-02	1.96E-02	1.85E-02	1.62E-02	1.54E-02	2.19E-02	1.99E-02	2.16E-02	2.35E-02	2.48E-02	2.86E-02	3.19E-02	2.86E-02	2.07E-02	1.68E-02	1.54E-02	1.30E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.32E-03	1.62E-03	1.13E-03	8.85E-04	7.45E-04	1.52E-03	3.41E-03	6.54E-03	9.81E-03	9.26E-03	8.10E-03	7.69E-03	1.10E-02	9.96E-03	1.08E-02	1.18E-02	1.24E-02	1.43E-02	1.60E-02	1.43E-02	1.04E-02	8.40E-03	7.70E-03	6.49E-03
	Emission in each Box of 1st jet	g/s	9.27E-04	6.46E-04	4.52E-04	3.54E-04	2.98E-04	6.07E-04	1.36E-03	2.62E-03	3.93E-03	3.70E-03	3.24E-03	3.08E-03	4.39E-03	3.98E-03	4.32E-03	4.70E-03	4.96E-03	5.71E-03	6.39E-03	5.73E-03	4.14E-03	3.36E-03	3.08E-03	2.60E-03
	Emission in each Box of 2nd jet	g/s	7.72E-04	5.39E-04	3.76E-04	2.95E-04	2.48E-04	5.06E-04	1.14E-03	2.18E-03	3.27E-03	3.09E-03	2.70E-03	2.56E-03	3.66E-03	3.32E-03	3.60E-03	3.92E-03	4.14E-03	4.76E-03	5.32E-03	4.77E-03	3.45E-03	2.80E-03	2.57E-03	2.16E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0030***	***0.0054***	***0.0051***	***0.0044***	***0.0041***	***0.0056***	***0.0050***	***0.0055***	***0.0061***	***0.0064***	***0.0075***	***0.0085***	***0.0077***	***0.0052***	***0.0039***	***0.0035***	***0.0030***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.17E-04	6.41E-04	4.51E-04	3.38E-04	2.82E-04	3.97E-04	8.64E-04	1.98E-03	3.59E-03	3.39E-03	2.93E-03	2.73E-03	3.75E-03	3.30E-03	3.69E-03	4.05E-03	4.28E-03	4.97E-03	5.65E-03	5.12E-03	3.49E-03	2.60E-03	2.35E-03	2.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.08E-04	3.21E-04	2.26E-04	1.69E-04	1.41E-04	1.98E-04	4.32E-04	9.91E-04	1.79E-03	1.69E-03	1.46E-03	1.36E-03	1.87E-03	1.65E-03	1.84E-03	2.03E-03	2.14E-03	2.49E-03	2.82E-03	2.56E-03	1.75E-03	1.30E-03	1.18E-03	1.01E-03
	Emission in each Box of 1st jet	g/s	1.63E-04	1.28E-04	9.03E-05	6.77E-05	5.63E-05	7.94E-05	1.73E-04	3.96E-04	7.17E-04	6.77E-04	5.85E-04	5.45E-04	7.49E-04	6.61E-04	7.38E-04	8.10E-04	8.57E-04	9.94E-04	1.13E-03	1.02E-03	6.98E-04	5.21E-04	4.70E-04	4.02E-04
	Emission in each Box of 2nd jet	g/s	1.36E-04	1.07E-04	7.52E-05	5.64E-05	4.69E-05	6.61E-05	1.44E-04	3.30E-04	5.98E-04	5.64E-04	4.88E-04	4.54E-04	6.24E-04	5.51E-04	6.15E-04	6.75E-04	7.14E-04	8.28E-04	9.41E-04	8.53E-04	5.82E-04	4.34E-04	3.92E-04	3.35E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1069	0.0912	0.0921	0.1005	0.1017	0.1798	0.1891	0.1405	0.1391	0.1354	0.1287	0.1276	0.1651	0.1626	0.1663	0.1695	0.1753	0.1837	0.1946	0.1810	0.1595	0.1601	0.1566	0.1493
	NO2	g/vehicle/km	0.0190	0.0183	0.0186	0.0193	0.0194	0.0236	0.0241	0.0214	0.0256	0.0249	0.0233	0.0227	0.0283	0.0270	0.0285	0.0293	0.0303	0.0321	0.0345	0.0325	0.0270	0.0249	0.0240	0.0232
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0065***	***0.0045***	***0.0032***	***0.0025***	***0.0021***	***0.0044***	***0.0098***	***0.0187***	***0.0280***	***0.0264***	***0.0231***	***0.0219***	***0.0313***	***0.0289***	***0.0313***	***0.0335***	***0.0361***	***0.0407***	***0.0456***	***0.0407***	***0.0294***	***0.0243***	***0.0222***	***0.0186***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.34E-03	3.02E-03	2.10E-03	1.69E-03	1.42E-03	2.92E-03	6.55E-03	1.24E-02	1.87E-02	1.76E-02	1.54E-02	1.46E-02	2.08E-02	1.92E-02	2.09E-02	2.23E-02	2.40E-02	2.72E-02	3.04E-02	2.71E-02	1.96E-02	1.62E-02	1.48E-02	1.24E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.17E-03	1.51E-03	1.05E-03	8.46E-04	7.11E-04	1.46E-03	3.27E-03	6.22E-03	9.33E-03	8.81E-03	7.70E-03	7.30E-03	1.04E-02	9.62E-03	1.04E-02	1.12E-02	1.20E-02	1.36E-02	1.52E-02	1.36E-02	9.82E-03	8.09E-03	7.39E-03	6.21E-03
	Emission in each Box of 1st jet	g/s	8.68E-04	6.05E-04	4.20E-04	3.38E-04	2.85E-04	5.83E-04	1.31E-03	2.49E-03	3.73E-03	3.52E-03	3.08E-03	2.92E-03	4.17E-03	3.85E-03	4.17E-03	4.46E-03	4.81E-03	5.43E-03	6.08E-03	5.42E-03	3.93E-03	3.24E-03	2.95E-03	2.48E-03
	Emission in each Box of 2nd jet	g/s	7.24E-04	5.04E-04	3.50E-04	2.82E-04	2.37E-04	4.86E-04	1.09E-03	2.07E-03	3.11E-03	2.94E-03	2.57E-03	2.43E-03	3.47E-03	3.21E-03	3.48E-03	3.72E-03	4.01E-03	4.53E-03	5.07E-03	4.52E-03	3.27E-03	2.70E-03	2.46E-03	2.07E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0028***	***0.0051***	***0.0049***	***0.0042***	***0.0039***	***0.0054***	***0.0048***	***0.0054***	***0.0058***	***0.0062***	***0.0071***	***0.0081***	***0.0073***	***0.0050***	***0.0038***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.72E-04	6.06E-04	4.25E-04	3.25E-04	2.71E-04	3.83E-04	8.34E-04	1.89E-03	3.43E-03	3.24E-03	2.79E-03	2.59E-03	3.57E-03	3.20E-03	3.57E-03	3.86E-03	4.16E-03	4.74E-03	5.39E-03	4.86E-03	3.32E-03	2.52E-03	2.27E-03	1.93E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.86E-04	3.03E-04	2.13E-04	1.63E-04	1.35E-04	1.91E-04	4.17E-04	9.47E-04	1.71E-03	1.62E-03	1.39E-03	1.30E-03	1.79E-03	1.60E-03	1.79E-03	1.93E-03	2.08E-03	2.37E-03	2.69E-03	2.43E-03	1.66E-03	1.26E-03	1.13E-03	9.65E-04
	Emission in each Box of 1st jet	g/s	1.54E-04	1.21E-04	8.50E-05	6.51E-05	5.42E-05	7.66E-05	1.67E-04	3.79E-04	6.86E-04	6.48E-04	5.57E-04	5.19E-04	7.14E-04	6.40E-04	7.14E-04	7.72E-04	8.32E-04	9.48E-04	1.08E-03	9.72E-04	6.64E-04	5.04E-04	4.53E-04	3.86E-04
	Emission in each Box of 2nd jet	g/s	1.29E-04	1.01E-04	7.08E-05	5.42E-05	4.52E-05	6.38E-05	1.39E-04	3.16E-04	5.72E-04	5.40E-04	4.64E-04	4.32E-04	5.95E-04	5.33E-04	5.95E-04	6.43E-04	6.94E-04	7.90E-04	8.98E-04	8.10E-04	5.53E-04	4.20E-04	3.78E-04	3.22E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0958	0.0811	0.0823	0.0872	0.0884	0.1565	0.1626	0.1217	0.1221	0.1182	0.1144	0.1131	0.1475	0.1447	0.1490	0.1513	0.1558	0.1658	0.1713	0.1622	0.1425	0.1391	0.1372	0.1305
	NO2	g/vehicle/km	0.0172	0.0165	0.0168	0.0170	0.0171	0.0207	0.0209	0.0187	0.0226	0.0219	0.0209	0.0203	0.0254	0.0242	0.0256	0.0263	0.0271	0.0291	0.0306	0.0293	0.0243	0.0219	0.0212	0.0205
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0058***	***0.0040***	***0.0028***	***0.0022***	***0.0019***	***0.0038***	***0.0084***	***0.0161***	***0.0246***	***0.0231***	***0.0205***	***0.0194***	***0.0279***	***0.0257***	***0.0280***	***0.0299***	***0.0321***	***0.0368***	***0.0401***	***0.0364***	***0.0263***	***0.0211***	***0.0194***	***0.0163***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.89E-03	2.69E-03	1.88E-03	1.47E-03	1.24E-03	2.54E-03	5.63E-03	1.08E-02	1.64E-02	1.54E-02	1.37E-02	1.29E-02	1.86E-02	1.71E-02	1.87E-02	1.99E-02	2.14E-02	2.45E-02	2.67E-02	2.43E-02	1.75E-02	1.41E-02	1.29E-02	1.09E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.95E-03	1.34E-03	9.38E-04	7.34E-04	6.18E-04	1.27E-03	2.82E-03	5.38E-03	8.19E-03	7.69E-03	6.84E-03	6.47E-03	9.31E-03	8.56E-03	9.35E-03	9.96E-03	1.07E-02	1.23E-02	1.34E-02	1.21E-02	8.77E-03	7.03E-03	6.47E-03	5.43E-03
	Emission in each Box of 1st jet	g/s	7.78E-04	5.38E-04	3.75E-04	2.94E-04	2.47E-04	5.08E-04	1.13E-03	2.15E-03	3.28E-03	3.08E-03	2.74E-03	2.59E-03	3.73E-03	3.42E-03	3.74E-03	3.98E-03	4.28E-03	4.90E-03	5.35E-03	4.86E-03	3.51E-03	2.81E-03	2.59E-03	2.17E-03
	Emission in each Box of 2nd jet	g/s	6.48E-04	4.48E-04	3.13E-04	2.45E-04	2.06E-04	4.23E-04	9.38E-04	1.79E-03	2.73E-03	2.56E-03	2.28E-03	2.16E-03	3.10E-03	2.85E-03	3.12E-03	3.32E-03	3.56E-03	4.08E-03	4.46E-03	4.05E-03	2.92E-03	2.34E-03	2.16E-03	1.81E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0025***	***0.0046***	***0.0043***	***0.0037***	***0.0035***	***0.0048***	***0.0043***	***0.0048***	***0.0052***	***0.0056***	***0.0064***	***0.0072***	***0.0066***	***0.0045***	***0.0033***	***0.0030***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.97E-04	5.45E-04	3.84E-04	2.87E-04	2.39E-04	3.37E-04	7.24E-04	1.66E-03	3.03E-03	2.85E-03	2.50E-03	2.32E-03	3.21E-03	2.86E-03	3.22E-03	3.46E-03	3.72E-03	4.30E-03	4.77E-03	4.38E-03	3.00E-03	2.21E-03	2.00E-03	1.70E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.49E-04	2.73E-04	1.92E-04	1.43E-04	1.19E-04	1.68E-04	3.62E-04	8.28E-04	1.52E-03	1.43E-03	1.25E-03	1.16E-03	1.60E-03	1.43E-03	1.61E-03	1.73E-03	1.86E-03	2.15E-03	2.39E-03	2.19E-03	1.50E-03	1.10E-03	1.00E-03	8.51E-04
	Emission in each Box of 1st jet	g/s	1.39E-04	1.09E-04	7.67E-05	5.74E-05	4.78E-05	6.73E-05	1.45E-04	3.31E-04	6.07E-04	5.70E-04	5.00E-04	4.64E-04	6.42E-04	5.72E-04	6.43E-04	6.92E-04	7.45E-04	8.60E-04	9.55E-04	8.77E-04	5.99E-04	4.42E-04	4.00E-04	3.40E-04
	Emission in each Box of 2nd jet	g/s	1.16E-04	9.08E-05	6.39E-05	4.78E-05	3.98E-05	5.61E-05	1.21E-04	2.76E-04	5.06E-04	4.75E-04	4.16E-04	3.87E-04	5.35E-04	4.77E-04	5.36E-04	5.77E-04	6.20E-04	7.16E-04	7.96E-04	7.31E-04	4.99E-04	3.68E-04	3.34E-04	2.84E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0923	0.0786	0.0818	0.0867	0.0873	0.1548	0.1588	0.1201	0.1193	0.1179	0.1106	0.1094	0.1418	0.1400	0.1422	0.1463	0.1532	0.1618	0.1681	0.1603	0.1409	0.1383	0.1356	0.1297
	NO2	g/vehicle/km	0.0166	0.0160	0.0167	0.0170	0.0169	0.0205	0.0205	0.0185	0.0222	0.0219	0.0202	0.0196	0.0245	0.0234	0.0246	0.0255	0.0268	0.0284	0.0301	0.0290	0.0241	0.0217	0.0210	0.0204
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0056***	***0.0039***	***0.0028***	***0.0022***	***0.0018***	***0.0038***	***0.0082***	***0.0159***	***0.0240***	***0.0230***	***0.0198***	***0.0188***	***0.0268***	***0.0248***	***0.0268***	***0.0289***	***0.0315***	***0.0359***	***0.0394***	***0.0360***	***0.0260***	***0.0210***	***0.0192***	***0.0162***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.75E-03	2.60E-03	1.87E-03	1.46E-03	1.22E-03	2.51E-03	5.50E-03	1.06E-02	1.60E-02	1.53E-02	1.32E-02	1.25E-02	1.79E-02	1.66E-02	1.78E-02	1.93E-02	2.10E-02	2.39E-02	2.62E-02	2.40E-02	1.73E-02	1.40E-02	1.28E-02	1.08E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.87E-03	1.30E-03	9.33E-04	7.30E-04	6.11E-04	1.26E-03	2.75E-03	5.31E-03	8.00E-03	7.67E-03	6.62E-03	6.26E-03	8.95E-03	8.28E-03	8.92E-03	9.63E-03	1.05E-02	1.20E-02	1.31E-02	1.20E-02	8.67E-03	6.99E-03	6.40E-03	5.39E-03
	Emission in each Box of 1st jet	g/s	7.50E-04	5.21E-04	3.73E-04	2.92E-04	2.44E-04	5.02E-04	1.10E-03	2.13E-03	3.20E-03	3.07E-03	2.65E-03	2.50E-03	3.58E-03	3.31E-03	3.57E-03	3.85E-03	4.20E-03	4.78E-03	5.25E-03	4.80E-03	3.47E-03	2.80E-03	2.56E-03	2.16E-03
	Emission in each Box of 2nd jet	g/s	6.25E-04	4.34E-04	3.11E-04	2.43E-04	2.04E-04	4.18E-04	9.16E-04	1.77E-03	2.67E-03	2.56E-03	2.21E-03	2.09E-03	2.98E-03	2.76E-03	2.97E-03	3.21E-03	3.50E-03	3.98E-03	4.37E-03	4.00E-03	2.89E-03	2.33E-03	2.13E-03	1.80E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0025***	***0.0045***	***0.0043***	***0.0036***	***0.0034***	***0.0046***	***0.0042***	***0.0046***	***0.0050***	***0.0055***	***0.0063***	***0.0070***	***0.0065***	***0.0044***	***0.0033***	***0.0030***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.75E-04	5.30E-04	3.82E-04	2.85E-04	2.36E-04	3.33E-04	7.09E-04	1.64E-03	2.98E-03	2.85E-03	2.42E-03	2.25E-03	3.10E-03	2.77E-03	3.08E-03	3.36E-03	3.67E-03	4.20E-03	4.70E-03	4.34E-03	2.97E-03	2.20E-03	1.98E-03	1.69E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.37E-04	2.65E-04	1.91E-04	1.43E-04	1.18E-04	1.67E-04	3.54E-04	8.20E-04	1.49E-03	1.42E-03	1.21E-03	1.12E-03	1.55E-03	1.39E-03	1.54E-03	1.68E-03	1.83E-03	2.10E-03	2.35E-03	2.17E-03	1.48E-03	1.10E-03	9.91E-04	8.47E-04
	Emission in each Box of 1st jet	g/s	1.35E-04	1.06E-04	7.63E-05	5.71E-05	4.73E-05	6.66E-05	1.42E-04	3.28E-04	5.95E-04	5.70E-04	4.84E-04	4.50E-04	6.19E-04	5.54E-04	6.17E-04	6.72E-04	7.34E-04	8.41E-04	9.39E-04	8.68E-04	5.93E-04	4.40E-04	3.96E-04	3.39E-04
	Emission in each Box of 2nd jet	g/s	1.12E-04	8.84E-05	6.36E-05	4.76E-05	3.94E-05	5.55E-05	1.18E-04	2.73E-04	4.96E-04	4.75E-04	4.03E-04	3.75E-04	5.16E-04	4.62E-04	5.14E-04	5.60E-04	6.12E-04	7.00E-04	7.83E-04	7.23E-04	4.94E-04	3.66E-04	3.30E-04	2.82E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0929	0.0781	0.0792	0.0839	0.0850	0.1499	0.1588	0.1170	0.1163	0.1139	0.1111	0.1106	0.1391	0.1375	0.1439	0.1470	0.1505	0.1612	0.1662	0.1585	0.1383	0.1366	0.1338	0.1264
	NO2	g/vehicle/km	0.0167	0.0159	0.0163	0.0165	0.0165	0.0199	0.0205	0.0181	0.0217	0.0212	0.0204	0.0199	0.0241	0.0230	0.0248	0.0256	0.0263	0.0283	0.0298	0.0287	0.0236	0.0215	0.0207	0.0199
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0057***	***0.0039***	***0.0027***	***0.0021***	***0.0018***	***0.0036***	***0.0082***	***0.0155***	***0.0234***	***0.0222***	***0.0199***	***0.0190***	***0.0263***	***0.0244***	***0.0271***	***0.0290***	***0.0310***	***0.0357***	***0.0389***	***0.0356***	***0.0255***	***0.0207***	***0.0189***	***0.0158***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.77E-03	2.59E-03	1.81E-03	1.41E-03	1.19E-03	2.43E-03	5.50E-03	1.04E-02	1.56E-02	1.48E-02	1.33E-02	1.27E-02	1.76E-02	1.63E-02	1.80E-02	1.93E-02	2.06E-02	2.38E-02	2.59E-02	2.37E-02	1.70E-02	1.38E-02	1.26E-02	1.05E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.89E-03	1.29E-03	9.03E-04	7.06E-04	5.94E-04	1.22E-03	2.75E-03	5.18E-03	7.80E-03	7.41E-03	6.65E-03	6.33E-03	8.78E-03	8.13E-03	9.02E-03	9.67E-03	1.03E-02	1.19E-02	1.30E-02	1.19E-02	8.51E-03	6.90E-03	6.31E-03	5.25E-03
	Emission in each Box of 1st jet	g/s	7.55E-04	5.17E-04	3.61E-04	2.82E-04	2.38E-04	4.86E-04	1.10E-03	2.07E-03	3.12E-03	2.97E-03	2.66E-03	2.53E-03	3.51E-03	3.25E-03	3.61E-03	3.87E-03	4.13E-03	4.77E-03	5.19E-03	4.75E-03	3.41E-03	2.76E-03	2.53E-03	2.10E-03
	Emission in each Box of 2nd jet	g/s	6.29E-04	4.31E-04	3.01E-04	2.35E-04	1.98E-04	4.05E-04	9.16E-04	1.73E-03	2.60E-03	2.47E-03	2.22E-03	2.11E-03	2.93E-03	2.71E-03	3.01E-03	3.22E-03	3.44E-03	3.97E-03	4.32E-03	3.96E-03	2.84E-03	2.30E-03	2.10E-03	1.75E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0005***	***0.0011***	***0.0024***	***0.0044***	***0.0041***	***0.0037***	***0.0034***	***0.0046***	***0.0041***	***0.0047***	***0.0051***	***0.0054***	***0.0063***	***0.0070***	***0.0064***	***0.0044***	***0.0033***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.79E-04	5.27E-04	3.71E-04	2.77E-04	2.31E-04	3.24E-04	7.09E-04	1.60E-03	2.91E-03	2.76E-03	2.44E-03	2.28E-03	3.04E-03	2.73E-03	3.12E-03	3.37E-03	3.61E-03	4.19E-03	4.65E-03	4.29E-03	2.91E-03	2.17E-03	1.96E-03	1.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.39E-04	2.64E-04	1.85E-04	1.39E-04	1.15E-04	1.62E-04	3.54E-04	8.01E-04	1.45E-03	1.38E-03	1.22E-03	1.14E-03	1.52E-03	1.36E-03	1.56E-03	1.69E-03	1.80E-03	2.09E-03	2.32E-03	2.15E-03	1.45E-03	1.09E-03	9.79E-04	8.27E-04
	Emission in each Box of 1st jet	g/s	1.36E-04	1.05E-04	7.42E-05	5.55E-05	4.62E-05	6.47E-05	1.42E-04	3.20E-04	5.81E-04	5.52E-04	4.87E-04	4.56E-04	6.09E-04	5.45E-04	6.23E-04	6.75E-04	7.21E-04	8.37E-04	9.29E-04	8.58E-04	5.82E-04	4.35E-04	3.91E-04	3.31E-04
	Emission in each Box of 2nd jet	g/s	1.13E-04	8.78E-05	6.18E-05	4.62E-05	3.85E-05	5.39E-05	1.18E-04	2.67E-04	4.85E-04	4.60E-04	4.06E-04	3.80E-04	5.07E-04	4.54E-04	5.19E-04	5.62E-04	6.01E-04	6.98E-04	7.74E-04	7.15E-04	4.85E-04	3.62E-04	3.26E-04	2.76E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involved	103P1
Road Located	103
Vehicle EF Adopted	103

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0942	0.0797	0.0808	0.0857	0.0868	0.1530	0.1620	0.1201	0.1177	0.1142	0.1129	0.1109	0.1418	0.1400	0.1431	0.1463	0.1542	0.1608	0.1711	0.1584	0.1384	0.1367	0.1339	0.1282
	NO2	g/vehicle/km	0.0169	0.0162	0.0166	0.0168	0.0168	0.0203	0.0208	0.0185	0.0219	0.0213	0.0206	0.0199	0.0245	0.0234	0.0247	0.0255	0.0269	0.0283	0.0306	0.0287	0.0236	0.0215	0.0208	0.0201
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0057***	***0.0040***	***0.0028***	***0.0022***	***0.0018***	***0.0037***	***0.0084***	***0.0159***	***0.0237***	***0.0223***	***0.0203***	***0.0190***	***0.0268***	***0.0248***	***0.0269***	***0.0289***	***0.0317***	***0.0356***	***0.0401***	***0.0356***	***0.0256***	***0.0207***	***0.0190***	***0.0160***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.82E-03	2.64E-03	1.84E-03	1.44E-03	1.21E-03	2.48E-03	5.61E-03	1.06E-02	1.58E-02	1.49E-02	1.35E-02	1.27E-02	1.79E-02	1.66E-02	1.80E-02	1.93E-02	2.12E-02	2.38E-02	2.67E-02	2.37E-02	1.70E-02	1.38E-02	1.26E-02	1.07E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.91E-03	1.32E-03	9.22E-04	7.21E-04	6.07E-04	1.24E-03	2.81E-03	5.31E-03	7.89E-03	7.43E-03	6.75E-03	6.34E-03	8.95E-03	8.28E-03	8.98E-03	9.63E-03	1.06E-02	1.19E-02	1.34E-02	1.19E-02	8.52E-03	6.91E-03	6.32E-03	5.33E-03
	Emission in each Box of 1st jet	g/s	7.65E-04	5.28E-04	3.69E-04	2.88E-04	2.43E-04	4.96E-04	1.12E-03	2.13E-03	3.16E-03	2.97E-03	2.70E-03	2.54E-03	3.58E-03	3.31E-03	3.59E-03	3.85E-03	4.23E-03	4.75E-03	5.34E-03	4.75E-03	3.41E-03	2.76E-03	2.53E-03	2.13E-03
	Emission in each Box of 2nd jet	g/s	6.37E-04	4.40E-04	3.07E-04	2.40E-04	2.02E-04	4.14E-04	9.35E-04	1.77E-03	2.63E-03	2.48E-03	2.25E-03	2.11E-03	2.98E-03	2.76E-03	2.99E-03	3.21E-03	3.53E-03	3.96E-03	4.45E-03	3.95E-03	2.84E-03	2.30E-03	2.11E-03	1.78E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0025***	***0.0044***	***0.0042***	***0.0037***	***0.0034***	***0.0046***	***0.0042***	***0.0047***	***0.0050***	***0.0055***	***0.0063***	***0.0072***	***0.0064***	***0.0044***	***0.0033***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.87E-04	5.37E-04	3.78E-04	2.83E-04	2.35E-04	3.30E-04	7.22E-04	1.64E-03	2.94E-03	2.77E-03	2.47E-03	2.28E-03	3.10E-03	2.77E-03	3.10E-03	3.36E-03	3.69E-03	4.18E-03	4.77E-03	4.29E-03	2.91E-03	2.17E-03	1.96E-03	1.67E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.43E-04	2.68E-04	1.89E-04	1.41E-04	1.18E-04	1.65E-04	3.61E-04	8.20E-04	1.47E-03	1.39E-03	1.24E-03	1.14E-03	1.55E-03	1.39E-03	1.55E-03	1.68E-03	1.85E-03	2.09E-03	2.39E-03	2.15E-03	1.46E-03	1.09E-03	9.79E-04	8.37E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	1.07E-04	7.55E-05	5.65E-05	4.71E-05	6.60E-05	1.44E-04	3.28E-04	5.88E-04	5.54E-04	4.94E-04	4.55E-04	6.19E-04	5.54E-04	6.21E-04	6.72E-04	7.38E-04	8.36E-04	9.55E-04	8.59E-04	5.82E-04	4.35E-04	3.92E-04	3.35E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	8.94E-05	6.30E-05	4.71E-05	3.92E-05	5.50E-05	1.20E-04	2.73E-04	4.90E-04	4.62E-04	4.12E-04	3.79E-04	5.16E-04	4.62E-04	5.17E-04	5.60E-04	6.15E-04	6.96E-04	7.95E-04	7.16E-04	4.85E-04	3.62E-04	3.26E-04	2.79E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0935	0.0791	0.0802	0.0844	0.0884	0.1556	0.1638	0.1186	0.1188	0.1156	0.1144	0.1108	0.1435	0.1437	0.1459	0.1501	0.1526	0.1602	0.1702	0.1565	0.1425	0.1399	0.1372	0.1313
	NO2	g/vehicle/km	0.0168	0.0161	0.0164	0.0166	0.0171	0.0206	0.0211	0.0183	0.0221	0.0215	0.0209	0.0199	0.0248	0.0240	0.0252	0.0261	0.0266	0.0282	0.0304	0.0283	0.0243	0.0220	0.0212	0.0206
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0057***	***0.0039***	***0.0027***	***0.0021***	***0.0019***	***0.0038***	***0.0085***	***0.0157***	***0.0239***	***0.0226***	***0.0205***	***0.0190***	***0.0272***	***0.0255***	***0.0275***	***0.0296***	***0.0314***	***0.0355***	***0.0399***	***0.0352***	***0.0263***	***0.0212***	***0.0194***	***0.0164***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.80E-03	2.62E-03	1.83E-03	1.42E-03	1.24E-03	2.52E-03	5.67E-03	1.05E-02	1.59E-02	1.50E-02	1.37E-02	1.27E-02	1.81E-02	1.70E-02	1.83E-02	1.98E-02	2.09E-02	2.37E-02	2.66E-02	2.34E-02	1.75E-02	1.41E-02	1.29E-02	1.09E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.90E-03	1.31E-03	9.14E-04	7.11E-04	6.18E-04	1.26E-03	2.84E-03	5.25E-03	7.96E-03	7.52E-03	6.84E-03	6.33E-03	9.06E-03	8.50E-03	9.15E-03	9.88E-03	1.05E-02	1.18E-02	1.33E-02	1.17E-02	8.77E-03	7.07E-03	6.47E-03	5.46E-03
	Emission in each Box of 1st jet	g/s	7.59E-04	5.24E-04	3.66E-04	2.84E-04	2.47E-04	5.05E-04	1.13E-03	2.10E-03	3.19E-03	3.01E-03	2.74E-03	2.53E-03	3.62E-03	3.40E-03	3.66E-03	3.95E-03	4.19E-03	4.73E-03	5.31E-03	4.69E-03	3.51E-03	2.83E-03	2.59E-03	2.18E-03
	Emission in each Box of 2nd jet	g/s	6.33E-04	4.37E-04	3.05E-04	2.37E-04	2.06E-04	4.21E-04	9.45E-04	1.75E-03	2.65E-03	2.51E-03	2.28E-03	2.11E-03	3.02E-03	2.83E-03	3.05E-03	3.29E-03	3.49E-03	3.95E-03	4.43E-03	3.91E-03	2.92E-03	2.36E-03	2.16E-03	1.82E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0005***	***0.0011***	***0.0024***	***0.0044***	***0.0042***	***0.0037***	***0.0034***	***0.0047***	***0.0043***	***0.0047***	***0.0052***	***0.0055***	***0.0062***	***0.0071***	***0.0064***	***0.0045***	***0.0033***	***0.0030***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.83E-04	5.33E-04	3.75E-04	2.79E-04	2.39E-04	3.35E-04	7.29E-04	1.62E-03	2.96E-03	2.80E-03	2.50E-03	2.27E-03	3.13E-03	2.84E-03	3.16E-03	3.44E-03	3.65E-03	4.16E-03	4.75E-03	4.24E-03	3.00E-03	2.22E-03	2.00E-03	1.71E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.41E-04	2.66E-04	1.87E-04	1.39E-04	1.19E-04	1.67E-04	3.65E-04	8.10E-04	1.48E-03	1.40E-03	1.25E-03	1.14E-03	1.56E-03	1.42E-03	1.58E-03	1.72E-03	1.83E-03	2.08E-03	2.37E-03	2.12E-03	1.50E-03	1.11E-03	1.00E-03	8.56E-04
	Emission in each Box of 1st jet	g/s	1.37E-04	1.07E-04	7.50E-05	5.58E-05	4.78E-05	6.70E-05	1.46E-04	3.24E-04	5.92E-04	5.60E-04	5.00E-04	4.55E-04	6.26E-04	5.69E-04	6.31E-04	6.88E-04	7.30E-04	8.32E-04	9.50E-04	8.49E-04	5.99E-04	4.44E-04	4.00E-04	3.42E-04
	Emission in each Box of 2nd jet	g/s	1.14E-04	8.88E-05	6.25E-05	4.65E-05	3.98E-05	5.58E-05	1.22E-04	2.70E-04	4.94E-04	4.66E-04	4.16E-04	3.79E-04	5.21E-04	4.74E-04	5.26E-04	5.73E-04	6.09E-04	6.94E-04	7.91E-04	7.07E-04	4.99E-04	3.70E-04	3.34E-04	2.85E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1059	0.0903	0.0912	0.0969	0.0977	0.1723	0.1821	0.1365	0.1351	0.1314	0.1248	0.1238	0.1611	0.1580	0.1616	0.1654	0.1703	0.1783	0.1908	0.1780	0.1575	0.1555	0.1526	0.1454
	NO2	g/vehicle/km	0.0189	0.0181	0.0185	0.0187	0.0186	0.0227	0.0233	0.0209	0.0249	0.0242	0.0226	0.0221	0.0276	0.0263	0.0277	0.0286	0.0296	0.0312	0.0339	0.0320	0.0267	0.0243	0.0235	0.0227
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0064***	***0.0045***	***0.0031***	***0.0024***	***0.0020***	***0.0042***	***0.0095***	***0.0181***	***0.0272***	***0.0256***	***0.0224***	***0.0213***	***0.0305***	***0.0280***	***0.0304***	***0.0327***	***0.0350***	***0.0395***	***0.0447***	***0.0400***	***0.0291***	***0.0236***	***0.0216***	***0.0181***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.30E-03	2.99E-03	2.08E-03	1.63E-03	1.37E-03	2.80E-03	6.30E-03	1.21E-02	1.81E-02	1.71E-02	1.49E-02	1.42E-02	2.03E-02	1.87E-02	2.03E-02	2.18E-02	2.34E-02	2.64E-02	2.98E-02	2.67E-02	1.94E-02	1.57E-02	1.44E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.15E-03	1.50E-03	1.04E-03	8.16E-04	6.83E-04	1.40E-03	3.15E-03	6.04E-03	9.06E-03	8.55E-03	7.47E-03	7.08E-03	1.02E-02	9.35E-03	1.01E-02	1.09E-02	1.17E-02	1.32E-02	1.49E-02	1.33E-02	9.69E-03	7.86E-03	7.20E-03	6.04E-03
	Emission in each Box of 1st jet	g/s	8.60E-04	5.99E-04	4.16E-04	3.26E-04	2.73E-04	5.59E-04	1.26E-03	2.42E-03	3.62E-03	3.42E-03	2.99E-03	2.83E-03	4.07E-03	3.74E-03	4.05E-03	4.35E-03	4.67E-03	5.27E-03	5.96E-03	5.33E-03	3.88E-03	3.14E-03	2.88E-03	2.42E-03
	Emission in each Box of 2nd jet	g/s	7.17E-04	4.99E-04	3.47E-04	2.72E-04	2.28E-04	4.66E-04	1.05E-03	2.01E-03	3.02E-03	2.85E-03	2.49E-03	2.36E-03	3.39E-03	3.12E-03	3.38E-03	3.63E-03	3.89E-03	4.39E-03	4.97E-03	4.44E-03	3.23E-03	2.62E-03	2.40E-03	2.01E-03
NO_2 Emission Rate		g/s	***0.0011***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0006***	***0.0012***	***0.0028***	***0.0050***	***0.0047***	***0.0041***	***0.0038***	***0.0052***	***0.0047***	***0.0052***	***0.0057***	***0.0061***	***0.0069***	***0.0079***	***0.0072***	***0.0049***	***0.0037***	***0.0033***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	7.66E-04	6.01E-04	4.21E-04	3.15E-04	2.61E-04	3.68E-04	8.06E-04	1.85E-03	3.34E-03	3.15E-03	2.71E-03	2.52E-03	3.48E-03	3.11E-03	3.47E-03	3.77E-03	4.05E-03	4.61E-03	5.29E-03	4.79E-03	3.28E-03	2.45E-03	2.21E-03	1.88E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.83E-04	3.01E-04	2.11E-04	1.57E-04	1.30E-04	1.84E-04	4.03E-04	9.24E-04	1.67E-03	1.58E-03	1.35E-03	1.26E-03	1.74E-03	1.55E-03	1.73E-03	1.89E-03	2.03E-03	2.30E-03	2.64E-03	2.39E-03	1.64E-03	1.23E-03	1.11E-03	9.42E-04
	Emission in each Box of 1st jet	g/s	1.53E-04	1.20E-04	8.43E-05	6.29E-05	5.22E-05	7.35E-05	1.61E-04	3.70E-04	6.68E-04	6.31E-04	5.42E-04	5.05E-04	6.97E-04	6.21E-04	6.94E-04	7.54E-04	8.11E-04	9.22E-04	1.06E-03	9.58E-04	6.57E-04	4.91E-04	4.43E-04	3.77E-04
	Emission in each Box of 2nd jet	g/s	1.28E-04	1.00E-04	7.02E-05	5.24E-05	4.35E-05	6.13E-05	1.34E-04	3.08E-04	5.57E-04	5.26E-04	4.51E-04	4.21E-04	5.81E-04	5.18E-04	5.78E-04	6.28E-04	6.76E-04	7.68E-04	8.81E-04	7.98E-04	5.47E-04	4.09E-04	3.69E-04	3.14E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1165	0.1009	0.1021	0.1094	0.1108	0.1948	0.2054	0.1539	0.1528	0.1491	0.1415	0.1395	0.1787	0.1753	0.1792	0.1837	0.1881	0.2004	0.2101	0.1991	0.1752	0.1730	0.1699	0.1626
	NO2	g/vehicle/km	0.0205	0.0199	0.0203	0.0208	0.0209	0.0254	0.0260	0.0233	0.0279	0.0272	0.0254	0.0247	0.0304	0.0290	0.0305	0.0316	0.0324	0.0348	0.0371	0.0355	0.0294	0.0268	0.0259	0.0252
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0071***	***0.0050***	***0.0035***	***0.0028***	***0.0023***	***0.0047***	***0.0107***	***0.0204***	***0.0307***	***0.0291***	***0.0254***	***0.0239***	***0.0338***	***0.0311***	***0.0337***	***0.0363***	***0.0387***	***0.0444***	***0.0492***	***0.0447***	***0.0323***	***0.0262***	***0.0240***	***0.0203***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.73E-03	3.34E-03	2.33E-03	1.84E-03	1.55E-03	3.16E-03	7.11E-03	1.36E-02	2.05E-02	1.94E-02	1.69E-02	1.60E-02	2.26E-02	2.07E-02	2.25E-02	2.42E-02	2.58E-02	2.96E-02	3.28E-02	2.98E-02	2.16E-02	1.75E-02	1.60E-02	1.35E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.37E-03	1.67E-03	1.16E-03	9.21E-04	7.75E-04	1.58E-03	3.56E-03	6.81E-03	1.02E-02	9.70E-03	8.47E-03	7.98E-03	1.13E-02	1.04E-02	1.12E-02	1.21E-02	1.29E-02	1.48E-02	1.64E-02	1.49E-02	1.08E-02	8.74E-03	8.02E-03	6.76E-03
	Emission in each Box of 1st jet	g/s	9.46E-04	6.68E-04	4.66E-04	3.68E-04	3.10E-04	6.32E-04	1.42E-03	2.72E-03	4.10E-03	3.88E-03	3.39E-03	3.19E-03	4.51E-03	4.15E-03	4.50E-03	4.84E-03	5.16E-03	5.92E-03	6.56E-03	5.97E-03	4.31E-03	3.50E-03	3.21E-03	2.70E-03
	Emission in each Box of 2nd jet	g/s	7.88E-04	5.57E-04	3.88E-04	3.07E-04	2.58E-04	5.27E-04	1.19E-03	2.27E-03	3.42E-03	3.23E-03	2.82E-03	2.66E-03	3.76E-03	3.46E-03	3.75E-03	4.03E-03	4.30E-03	4.94E-03	5.47E-03	4.97E-03	3.59E-03	2.91E-03	2.67E-03	2.25E-03
NO_2 Emission Rate		g/s	***0.0012***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0006***	***0.0013***	***0.0031***	***0.0056***	***0.0053***	***0.0046***	***0.0042***	***0.0058***	***0.0051***	***0.0057***	***0.0062***	***0.0067***	***0.0077***	***0.0087***	***0.0080***	***0.0054***	***0.0041***	***0.0037***	***0.0031***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.32E-04	6.60E-04	4.64E-04	3.50E-04	2.92E-04	4.12E-04	9.00E-04	2.06E-03	3.74E-03	3.54E-03	3.04E-03	2.82E-03	3.84E-03	3.43E-03	3.82E-03	4.15E-03	4.45E-03	5.14E-03	5.79E-03	5.31E-03	3.62E-03	2.71E-03	2.45E-03	2.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.16E-04	3.30E-04	2.32E-04	1.75E-04	1.46E-04	2.06E-04	4.50E-04	1.03E-03	1.87E-03	1.77E-03	1.52E-03	1.41E-03	1.92E-03	1.71E-03	1.91E-03	2.08E-03	2.22E-03	2.57E-03	2.89E-03	2.66E-03	1.81E-03	1.35E-03	1.22E-03	1.05E-03
	Emission in each Box of 1st jet	g/s	1.66E-04	1.32E-04	9.27E-05	7.01E-05	5.83E-05	8.24E-05	1.80E-04	4.12E-04	7.48E-04	7.08E-04	6.09E-04	5.64E-04	7.68E-04	6.85E-04	7.65E-04	8.31E-04	8.90E-04	1.03E-03	1.16E-03	1.06E-03	7.25E-04	5.42E-04	4.89E-04	4.18E-04
	Emission in each Box of 2nd jet	g/s	1.39E-04	1.10E-04	7.73E-05	5.84E-05	4.86E-05	6.86E-05	1.50E-04	3.44E-04	6.23E-04	5.90E-04	5.07E-04	4.70E-04	6.40E-04	5.71E-04	6.37E-04	6.92E-04	7.42E-04	8.57E-04	9.65E-04	8.85E-04	6.04E-04	4.51E-04	4.08E-04	3.49E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	103A01-103A08
Enclosure Involvec	103P1
Road Located	103
Vehicle EF Adopte	103

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1196	976	672	496	412	478	1020	2607	3951	3834	3525	3370	3719	3485	3696	3878	4041	4354	4600	4413	3626	2978	2780	2449
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1234	0.1059	0.1072	0.1143	0.1172	0.2044	0.2149	0.1611	0.1599	0.1557	0.1472	0.1454	0.1856	0.1821	0.1867	0.1909	0.1954	0.2077	0.2200	0.2058	0.1819	0.1792	0.1783	0.1706
	NO2	g/vehicle/km	0.0215	0.0208	0.0212	0.0216	0.0218	0.0265	0.0270	0.0242	0.0289	0.0282	0.0264	0.0256	0.0316	0.0300	0.0317	0.0328	0.0336	0.0359	0.0386	0.0365	0.0305	0.0276	0.0270	0.0262
	RSP	g/vehicle/km	0.0084	0.0071	0.0073	0.0078	0.0079	0.0141	0.0148	0.0108	0.0097	0.0095	0.0095	0.0095	0.0120	0.0121	0.0120	0.0122	0.0123	0.0128	0.0131	0.0124	0.0118	0.0122	0.0122	0.0117
	FSP	g/vehicle/km	0.0077	0.0066	0.0067	0.0071	0.0072	0.0129	0.0136	0.0100	0.0089	0.0088	0.0087	0.0088	0.0111	0.0111	0.0111	0.0113	0.0113	0.0117	0.0121	0.0115	0.0109	0.0113	0.0112	0.0107
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30	183.30
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0075***	***0.0053***	***0.0037***	***0.0029***	***0.0025***	***0.0050***	***0.0112***	***0.0214***	***0.0322***	***0.0304***	***0.0264***	***0.0250***	***0.0352***	***0.0323***	***0.0351***	***0.0377***	***0.0402***	***0.0461***	***0.0515***	***0.0463***	***0.0336***	***0.0272***	***0.0252***	***0.0213***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.01E-03	3.51E-03	2.45E-03	1.92E-03	1.64E-03	3.32E-03	7.44E-03	1.43E-02	2.14E-02	2.03E-02	1.76E-02	1.66E-02	2.34E-02	2.15E-02	2.34E-02	2.51E-02	2.68E-02	3.07E-02	3.44E-02	3.08E-02	2.24E-02	1.81E-02	1.68E-02	1.42E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.50E-03	1.76E-03	1.22E-03	9.62E-04	8.19E-04	1.66E-03	3.72E-03	7.13E-03	1.07E-02	1.01E-02	8.81E-03	8.32E-03	1.17E-02	1.08E-02	1.17E-02	1.26E-02	1.34E-02	1.54E-02	1.72E-02	1.54E-02	1.12E-02	9.06E-03	8.41E-03	7.09E-03
	Emission in each Box of 1st jet	g/s	1.00E-03	7.02E-04	4.89E-04	3.85E-04	3.28E-04	6.63E-04	1.49E-03	2.85E-03	4.29E-03	4.05E-03	3.52E-03	3.33E-03	4.69E-03	4.31E-03	4.69E-03	5.03E-03	5.36E-03	6.14E-03	6.87E-03	6.17E-03	4.48E-03	3.62E-03	3.36E-03	2.84E-03
	Emission in each Box of 2nd jet	g/s	8.35E-04	5.85E-04	4.08E-04	3.21E-04	2.73E-04	5.53E-04	1.24E-03	2.38E-03	3.57E-03	3.38E-03	2.94E-03	2.77E-03	3.91E-03	3.59E-03	3.90E-03	4.19E-03	4.47E-03	5.12E-03	5.73E-03	5.14E-03	3.73E-03	3.02E-03	2.80E-03	2.36E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0006***	***0.0014***	***0.0032***	***0.0058***	***0.0055***	***0.0047***	***0.0044***	***0.0060***	***0.0053***	***0.0060***	***0.0065***	***0.0069***	***0.0080***	***0.0091***	***0.0082***	***0.0056***	***0.0042***	***0.0038***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.75E-04	6.88E-04	4.83E-04	3.63E-04	3.05E-04	4.30E-04	9.36E-04	2.14E-03	3.88E-03	3.67E-03	3.16E-03	2.92E-03	3.98E-03	3.55E-03	3.98E-03	4.31E-03	4.60E-03	5.30E-03	6.03E-03	5.47E-03	3.75E-03	2.79E-03	2.55E-03	2.18E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.37E-04	3.44E-04	2.42E-04	1.82E-04	1.53E-04	2.15E-04	4.68E-04	1.07E-03	1.94E-03	1.83E-03	1.58E-03	1.46E-03	1.99E-03	1.77E-03	1.99E-03	2.16E-03	2.30E-03	2.65E-03	3.02E-03	2.74E-03	1.87E-03	1.40E-03	1.27E-03	1.09E-03
	Emission in each Box of 1st jet	g/s	1.75E-04	1.38E-04	9.67E-05	7.26E-05	6.11E-05	8.60E-05	1.87E-04	4.28E-04	7.75E-04	7.34E-04	6.32E-04	5.85E-04	7.97E-04	7.09E-04	7.95E-04	8.62E-04	9.21E-04	1.06E-03	1.21E-03	1.09E-03	7.50E-04	5.58E-04	5.10E-04	4.36E-04
	Emission in each Box of 2nd jet	g/s	1.46E-04	1.15E-04	8.06E-05	6.05E-05	5.09E-05	7.17E-05	1.56E-04	3.57E-04	6.46E-04	6.12E-04	5.26E-04	4.87E-04	6.64E-04	5.91E-04	6.63E-04	7.19E-04	7.67E-04	8.84E-04	1.01E-03	9.12E-04	6.25E-04	4.65E-04	4.25E-04	3.63E-04
RSP Emission Rate		g/s	***5.12E-04***	***3.55E-04***	***2.49E-04***	***1.96E-04***	***1.66E-04***	***3.42E-04***	***7.66E-04***	***1.43E-03***	***1.96E-03***	***1.86E-03***	***1.71E-03***	***1.63E-03***	***2.27E-03***	***2.14E-03***	***2.27E-03***	***2.41E-03***	***2.52E-03***	***2.83E-03***	***3.07E-03***	***2.79E-03***	***2.18E-03***	***1.85E-03***	***1.73E-03***	***1.45E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	3.41E-04	2.37E-04	1.66E-04	1.31E-04	1.10E-04	2.28E-04	5.11E-04	9.57E-04	1.30E-03	1.24E-03	1.14E-03	1.09E-03	1.51E-03	1.43E-03	1.51E-03	1.61E-03	1.68E-03	1.89E-03	2.05E-03	1.86E-03	1.45E-03	1.24E-03	1.15E-03	9.69E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.71E-04	1.18E-04	8.29E-05	6.54E-05	5.52E-05	1.14E-04	2.55E-04	4.78E-04	6.52E-04	6.19E-04	5.71E-04	5.44E-04	7.57E-04	7.13E-04	7.55E-04	8.04E-04	8.41E-04	9.44E-04	1.02E-03	9.30E-04	7.25E-04	6.18E-04	5.76E-04	4.84E-04
	Emission in each Box of 1st jet	g/s	6.83E-05	4.74E-05	3.32E-05	2.62E-05	2.21E-05	4.56E-05	1.02E-04	1.91E-04	2.61E-04	2.48E-04	2.28E-04	2.17E-04	3.03E-04	2.85E-04	3.02E-04	3.21E-04	3.36E-04	3.77E-04	4.10E-04	3.72E-04	2.90E-04	2.47E-04	2.30E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	5.69E-05	3.95E-05	2.76E-05	2.18E-05	1.84E-05	3.80E-05	8.52E-05	1.59E-04	2.17E-04	2.06E-04	1.90E-04	1.81E-04	2.52E-04	2.38E-04	2.52E-04	2.68E-04	2.80E-04	3.15E-04	3.41E-04	3.10E-04	2.42E-04	2.06E-04	1.92E-04	1.61E-04
FSP Emission Rate		g/s	***4.71E-04***	***3.27E-04***	***2.29E-04***	***1.79E-04***	***1.51E-04***	***3.14E-04***	***7.05E-04***	***1.32E-03***	***1.79E-03***	***1.71E-03***	***1.57E-03***	***1.50E-03***	***2.09E-03***	***1.97E-03***	***2.09E-03***	***2.22E-03***	***2.33E-03***	***2.60E-03***	***2.83E-03***	***2.57E-03***	***2.00E-03***	***1.71E-03***	***1.58E-03***	***1.34E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	3.14E-04	2.18E-04	1.53E-04	1.20E-04	1.01E-04	2.09E-04	4.70E-04	8.81E-04	1.19E-03	1.14E-03	1.05E-03	1.00E-03	1.40E-03	1.31E-03	1.39E-03	1.48E-03	1.55E-03	1.73E-03	1.88E-03	1.72E-03	1.34E-03	1.14E-03	1.05E-03	8.92E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.57E-04	1.09E-04	7.63E-05	5.98E-05	5.04E-05	1.05E-04	2.35E-04	4.41E-04	5.97E-04	5.71E-04	5.23E-04	5.01E-04	6.98E-04	6.57E-04	6.96E-04	7.41E-04	7.76E-04	8.67E-04	9.42E-04	8.58E-04	6.68E-04	5.69E-04	5.27E-04	4.46E-04
	Emission in each Box of 1st jet	g/s	6.28E-05	4.36E-05	3.05E-05	2.39E-05	2.02E-05	4.18E-05	9.40E-05	1.76E-04	2.39E-04	2.29E-04	2.09E-04	2.01E-04	2.79E-04	2.63E-04	2.78E-04	2.97E-04	3.10E-04	3.47E-04	3.77E-04	3.43E-04	2.67E-04	2.28E-04	2.11E-04	1.78E-04
	Emission in each Box of 2nd jet	g/s	5.24E-05	3.64E-05	2.54E-05	1.99E-05	1.68E-05	3.48E-05	7.83E-05	1.47E-04	1.99E-04	1.90E-04	1.74E-04	1.67E-04	2.33E-04	2.19E-04	2.32E-04	2.47E-04	2.59E-04	2.89E-04	3.14E-04	2.86E-04	2.23E-04	1.90E-04	1.76E-04	1.49E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section 104A01-104A08

Enclosure Involvec 104P1

Road Located 104

Vehicle EF Adopte 104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1329	0.1129	0.1152	0.1202	0.1230	0.2301	0.2461	0.1862	0.2212	0.2091	0.1897	0.1835	0.1490	0.1449	0.1474	0.1536	0.1577	0.1670	0.1778	0.1688	0.1430	0.1322	0.1310	0.1279
	NO2	g/vehicle/km	0.0221	0.0212	0.0215	0.0220	0.0222	0.0280	0.0288	0.0271	0.0398	0.0375	0.0338	0.0322	0.0297	0.0284	0.0294	0.0308	0.0315	0.0336	0.0361	0.0343	0.0281	0.0248	0.0243	0.0239
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0153***	***0.0106***	***0.0074***	***0.0057***	***0.0049***	***0.0108***	***0.0245***	***0.0469***	***0.0842***	***0.0773***	***0.0644***	***0.0596***	***0.0430***	***0.0390***	***0.0422***	***0.0462***	***0.0494***	***0.0564***	***0.0636***	***0.0580***	***0.0401***	***0.0302***	***0.0281***	***0.0243***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.02E-02	7.07E-03	4.96E-03	3.82E-03	3.27E-03	7.17E-03	1.63E-02	3.13E-02	5.61E-02	5.15E-02	4.29E-02	3.97E-02	2.86E-02	2.60E-02	2.81E-02	3.08E-02	3.29E-02	3.76E-02	4.24E-02	3.87E-02	2.68E-02	2.02E-02	1.87E-02	1.62E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.10E-03	3.53E-03	2.48E-03	1.91E-03	1.64E-03	3.59E-03	8.16E-03	1.56E-02	2.81E-02	2.58E-02	2.15E-02	1.99E-02	1.43E-02	1.30E-02	1.41E-02	1.54E-02	1.65E-02	1.88E-02	2.12E-02	1.93E-02	1.34E-02	1.01E-02	9.37E-03	8.11E-03
	Emission in each Box of 1st jet	g/s	2.04E-03	1.41E-03	9.92E-04	7.64E-04	6.55E-04	1.43E-03	3.26E-03	6.26E-03	1.12E-02	1.03E-02	8.59E-03	7.95E-03	5.73E-03	5.20E-03	5.62E-03	6.16E-03	6.59E-03	7.52E-03	8.48E-03	7.73E-03	5.35E-03	4.03E-03	3.75E-03	3.24E-03
	Emission in each Box of 2nd jet	g/s	1.70E-03	1.18E-03	8.26E-04	6.37E-04	5.45E-04	1.20E-03	2.72E-03	5.22E-03	9.35E-03	8.58E-03	7.16E-03	6.62E-03	4.77E-03	4.33E-03	4.69E-03	5.13E-03	5.49E-03	6.27E-03	7.06E-03	6.44E-03	4.46E-03	3.36E-03	3.12E-03	2.70E-03
NO_2 Emission Rate		g/s	***0.0026***	***0.0020***	***0.0014***	***0.0011***	***0.0009***	***0.0013***	***0.0029***	***0.0068***	***0.0151***	***0.0139***	***0.0115***	***0.0105***	***0.0086***	***0.0077***	***0.0084***	***0.0093***	***0.0099***	***0.0113***	***0.0129***	***0.0118***	***0.0079***	***0.0057***	***0.0052***	***0.0045***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.70E-03	1.33E-03	9.25E-04	7.01E-04	5.92E-04	8.73E-04	1.91E-03	4.56E-03	1.01E-02	9.25E-03	7.65E-03	6.98E-03	5.70E-03	5.10E-03	5.60E-03	6.17E-03	6.58E-03	7.56E-03	8.62E-03	7.86E-03	5.26E-03	3.79E-03	3.48E-03	3.02E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.50E-04	6.64E-04	4.63E-04	3.50E-04	2.96E-04	4.36E-04	9.54E-04	2.28E-03	5.05E-03	4.62E-03	3.82E-03	3.49E-03	2.85E-03	2.55E-03	2.80E-03	3.08E-03	3.29E-03	3.78E-03	4.31E-03	3.93E-03	2.63E-03	1.89E-03	1.74E-03	1.51E-03
	Emission in each Box of 1st jet	g/s	3.40E-04	2.66E-04	1.85E-04	1.40E-04	1.18E-04	1.75E-04	3.82E-04	9.11E-04	2.02E-03	1.85E-03	1.53E-03	1.40E-03	1.14E-03	1.02E-03	1.12E-03	1.23E-03	1.32E-03	1.51E-03	1.72E-03	1.57E-03	1.05E-03	7.58E-04	6.96E-04	6.05E-04
	Emission in each Box of 2nd jet	g/s	2.83E-04	2.21E-04	1.54E-04	1.17E-04	9.86E-05	1.45E-04	3.18E-04	7.59E-04	1.68E-03	1.54E-03	1.27E-03	1.16E-03	9.50E-04	8.50E-04	9.34E-04	1.03E-03	1.10E-03	1.26E-03	1.44E-03	1.31E-03	8.76E-04	6.31E-04	5.80E-04	5.04E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1237	0.1039	0.1057	0.1118	0.1143	0.2147	0.2275	0.1736	0.2043	0.1905	0.1742	0.1685	0.1368	0.1340	0.1375	0.1420	0.1455	0.1549	0.1647	0.1577	0.1334	0.1236	0.1209	0.1180
	NO2	g/vehicle/km	0.0208	0.0198	0.0200	0.0207	0.0209	0.0263	0.0268	0.0255	0.0371	0.0347	0.0313	0.0299	0.0275	0.0265	0.0277	0.0287	0.0294	0.0315	0.0339	0.0323	0.0265	0.0234	0.0227	0.0223
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0143***	***0.0098***	***0.0068***	***0.0053***	***0.0046***	***0.0100***	***0.0226***	***0.0438***	***0.0777***	***0.0704***	***0.0592***	***0.0547***	***0.0394***	***0.0361***	***0.0394***	***0.0427***	***0.0456***	***0.0523***	***0.0589***	***0.0542***	***0.0374***	***0.0283***	***0.0259***	***0.0224***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.50E-03	6.50E-03	4.55E-03	3.55E-03	3.04E-03	6.69E-03	1.51E-02	2.92E-02	5.18E-02	4.69E-02	3.94E-02	3.65E-02	2.63E-02	2.41E-02	2.62E-02	2.85E-02	3.04E-02	3.49E-02	3.93E-02	3.61E-02	2.50E-02	1.88E-02	1.73E-02	1.49E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.75E-03	3.25E-03	2.28E-03	1.78E-03	1.52E-03	3.35E-03	7.54E-03	1.46E-02	2.59E-02	2.35E-02	1.97E-02	1.82E-02	1.31E-02	1.20E-02	1.31E-02	1.42E-02	1.52E-02	1.74E-02	1.96E-02	1.81E-02	1.25E-02	9.42E-03	8.64E-03	7.47E-03
	Emission in each Box of 1st jet	g/s	1.90E-03	1.30E-03	9.10E-04	7.11E-04	6.08E-04	1.34E-03	3.02E-03	5.84E-03	1.04E-02	9.38E-03	7.89E-03	7.30E-03	5.26E-03	4.81E-03	5.25E-03	5.69E-03	6.08E-03	6.97E-03	7.85E-03	7.22E-03	4.99E-03	3.77E-03	3.46E-03	2.99E-03
	Emission in each Box of 2nd jet	g/s	1.58E-03	1.08E-03	7.58E-04	5.92E-04	5.07E-04	1.12E-03	2.51E-03	4.86E-03	8.64E-03	7.82E-03	6.57E-03	6.08E-03	4.38E-03	4.01E-03	4.37E-03	4.74E-03	5.07E-03	5.81E-03	6.54E-03	6.02E-03	4.16E-03	3.14E-03	2.88E-03	2.49E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0008***	***0.0012***	***0.0027***	***0.0064***	***0.0141***	***0.0128***	***0.0106***	***0.0097***	***0.0079***	***0.0071***	***0.0079***	***0.0086***	***0.0092***	***0.0106***	***0.0121***	***0.0111***	***0.0074***	***0.0054***	***0.0049***	***0.0042***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.60E-03	1.24E-03	8.63E-04	6.59E-04	5.56E-04	8.20E-04	1.78E-03	4.29E-03	9.40E-03	8.54E-03	7.09E-03	6.48E-03	5.28E-03	4.77E-03	5.28E-03	5.75E-03	6.13E-03	7.09E-03	8.08E-03	7.39E-03	4.95E-03	3.57E-03	3.25E-03	2.82E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.99E-04	6.21E-04	4.31E-04	3.30E-04	2.78E-04	4.10E-04	8.89E-04	2.14E-03	4.70E-03	4.27E-03	3.54E-03	3.24E-03	2.64E-03	2.38E-03	2.64E-03	2.88E-03	3.07E-03	3.55E-03	4.04E-03	3.70E-03	2.48E-03	1.79E-03	1.62E-03	1.41E-03
	Emission in each Box of 1st jet	g/s	3.20E-04	2.48E-04	1.73E-04	1.32E-04	1.11E-04	1.64E-04	3.56E-04	8.57E-04	1.88E-03	1.71E-03	1.42E-03	1.30E-03	1.06E-03	9.53E-04	1.06E-03	1.15E-03	1.23E-03	1.42E-03	1.62E-03	1.48E-03	9.90E-04	7.15E-04	6.50E-04	5.64E-04
	Emission in each Box of 2nd jet	g/s	2.66E-04	2.07E-04	1.44E-04	1.10E-04	9.27E-05	1.37E-04	2.96E-04	7.14E-04	1.57E-03	1.42E-03	1.18E-03	1.08E-03	8.79E-04	7.94E-04	8.80E-04	9.59E-04	1.02E-03	1.18E-03	1.35E-03	1.23E-03	8.25E-04	5.96E-04	5.41E-04	4.70E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1164	0.0977	0.0997	0.1038	0.1061	0.2007	0.2132	0.1628	0.1922	0.1811	0.1636	0.1605	0.1303	0.1256	0.1289	0.1348	0.1367	0.1462	0.1565	0.1484	0.1250	0.1157	0.1132	0.1107
	NO2	g/vehicle/km	0.0197	0.0188	0.0191	0.0195	0.0197	0.0248	0.0253	0.0241	0.0351	0.0331	0.0296	0.0286	0.0263	0.0250	0.0261	0.0273	0.0277	0.0299	0.0323	0.0306	0.0250	0.0221	0.0214	0.0210
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0134***	***0.0092***	***0.0064***	***0.0049***	***0.0042***	***0.0094***	***0.0212***	***0.0411***	***0.0731***	***0.0669***	***0.0556***	***0.0522***	***0.0376***	***0.0338***	***0.0369***	***0.0405***	***0.0428***	***0.0494***	***0.0560***	***0.0510***	***0.0351***	***0.0265***	***0.0243***	***0.0210***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.94E-03	6.12E-03	4.29E-03	3.30E-03	2.82E-03	6.26E-03	1.41E-02	2.74E-02	4.88E-02	4.46E-02	3.70E-02	3.48E-02	2.50E-02	2.25E-02	2.46E-02	2.70E-02	2.85E-02	3.29E-02	3.73E-02	3.40E-02	2.34E-02	1.76E-02	1.62E-02	1.40E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.47E-03	3.06E-03	2.15E-03	1.65E-03	1.41E-03	3.13E-03	7.07E-03	1.37E-02	2.44E-02	2.23E-02	1.85E-02	1.74E-02	1.25E-02	1.13E-02	1.23E-02	1.35E-02	1.43E-02	1.65E-02	1.87E-02	1.70E-02	1.17E-02	8.82E-03	8.09E-03	7.02E-03
	Emission in each Box of 1st jet	g/s	1.79E-03	1.22E-03	8.58E-04	6.60E-04	5.65E-04	1.25E-03	2.83E-03	5.47E-03	9.75E-03	8.92E-03	7.41E-03	6.95E-03	5.01E-03	4.51E-03	4.92E-03	5.40E-03	5.71E-03	6.58E-03	7.46E-03	6.80E-03	4.68E-03	3.53E-03	3.24E-03	2.81E-03
	Emission in each Box of 2nd jet	g/s	1.49E-03	1.02E-03	7.15E-04	5.50E-04	4.70E-04	1.04E-03	2.36E-03	4.56E-03	8.13E-03	7.43E-03	6.17E-03	5.79E-03	4.17E-03	3.76E-03	4.10E-03	4.50E-03	4.76E-03	5.49E-03	6.22E-03	5.67E-03	3.90E-03	2.94E-03	2.70E-03	2.34E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0012***	***0.0025***	***0.0061***	***0.0134***	***0.0122***	***0.0100***	***0.0093***	***0.0076***	***0.0067***	***0.0075***	***0.0082***	***0.0087***	***0.0101***	***0.0116***	***0.0105***	***0.0070***	***0.0051***	***0.0046***	***0.0040***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.51E-03	1.18E-03	8.21E-04	6.20E-04	5.23E-04	7.72E-04	1.68E-03	4.05E-03	8.91E-03	8.14E-03	6.70E-03	6.20E-03	5.05E-03	4.49E-03	4.97E-03	5.48E-03	5.78E-03	6.73E-03	7.71E-03	7.02E-03	4.67E-03	3.37E-03	3.06E-03	2.67E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.57E-04	5.89E-04	4.11E-04	3.10E-04	2.61E-04	3.86E-04	8.38E-04	2.02E-03	4.45E-03	4.07E-03	3.35E-03	3.10E-03	2.53E-03	2.25E-03	2.49E-03	2.74E-03	2.89E-03	3.37E-03	3.86E-03	3.51E-03	2.34E-03	1.69E-03	1.53E-03	1.33E-03
	Emission in each Box of 1st jet	g/s	3.03E-04	2.36E-04	1.64E-04	1.24E-04	1.05E-04	1.54E-04	3.35E-04	8.10E-04	1.78E-03	1.63E-03	1.34E-03	1.24E-03	1.01E-03	8.99E-04	9.94E-04	1.10E-03	1.16E-03	1.35E-03	1.54E-03	1.40E-03	9.35E-04	6.74E-04	6.13E-04	5.33E-04
	Emission in each Box of 2nd jet	g/s	2.52E-04	1.96E-04	1.37E-04	1.03E-04	8.71E-05	1.29E-04	2.79E-04	6.75E-04	1.48E-03	1.36E-03	1.12E-03	1.03E-03	8.42E-04	7.49E-04	8.29E-04	9.13E-04	9.64E-04	1.12E-03	1.29E-03	1.17E-03	7.79E-04	5.62E-04	5.11E-04	4.44E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104A01-104A08
Enclosure Involvec: 104P1
Road Located: 104
Vehicle EF Adopte: 104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1090	0.0914	0.0927	0.0991	0.1013	0.1929	0.2050	0.1549	0.1828	0.1724	0.1556	0.1524	0.1236	0.1212	0.1245	0.1278	0.1323	0.1389	0.1488	0.1403	0.1184	0.1114	0.1085	0.1057
	NO2	g/vehicle/km	0.0186	0.0178	0.0180	0.0188	0.0189	0.0239	0.0244	0.0230	0.0336	0.0316	0.0282	0.0272	0.0251	0.0243	0.0252	0.0260	0.0269	0.0285	0.0308	0.0291	0.0237	0.0214	0.0206	0.0202
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0126***	***0.0086***	***0.0060***	***0.0047***	***0.0040***	***0.0090***	***0.0204***	***0.0390***	***0.0696***	***0.0637***	***0.0528***	***0.0495***	***0.0356***	***0.0326***	***0.0356***	***0.0384***	***0.0414***	***0.0469***	***0.0532***	***0.0482***	***0.0332***	***0.0255***	***0.0233***	***0.0201***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.37E-03	5.72E-03	3.99E-03	3.15E-03	2.70E-03	6.01E-03	1.36E-02	2.60E-02	4.64E-02	4.24E-02	3.52E-02	3.30E-02	2.38E-02	2.18E-02	2.38E-02	2.56E-02	2.76E-02	3.13E-02	3.55E-02	3.21E-02	2.22E-02	1.70E-02	1.55E-02	1.34E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.19E-03	2.86E-03	2.00E-03	1.57E-03	1.35E-03	3.01E-03	6.80E-03	1.30E-02	2.32E-02	2.12E-02	1.76E-02	1.65E-02	1.19E-02	1.09E-02	1.19E-02	1.28E-02	1.38E-02	1.56E-02	1.77E-02	1.61E-02	1.11E-02	8.50E-03	7.75E-03	6.70E-03
	Emission in each Box of 1st jet	g/s	1.67E-03	1.14E-03	7.99E-04	6.30E-04	5.39E-04	1.20E-03	2.72E-03	5.21E-03	9.27E-03	8.49E-03	7.05E-03	6.60E-03	4.75E-03	4.35E-03	4.75E-03	5.12E-03	5.53E-03	6.26E-03	7.10E-03	6.43E-03	4.43E-03	3.40E-03	3.10E-03	2.68E-03
	Emission in each Box of 2nd jet	g/s	1.40E-03	9.53E-04	6.66E-04	5.25E-04	4.49E-04	1.00E-03	2.27E-03	4.34E-03	7.73E-03	7.07E-03	5.87E-03	5.50E-03	3.96E-03	3.63E-03	3.96E-03	4.27E-03	4.61E-03	5.21E-03	5.91E-03	5.36E-03	3.69E-03	2.83E-03	2.58E-03	2.23E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0017***	***0.0012***	***0.0009***	***0.0008***	***0.0011***	***0.0024***	***0.0058***	***0.0128***	***0.0117***	***0.0096***	***0.0089***	***0.0072***	***0.0065***	***0.0072***	***0.0078***	***0.0084***	***0.0096***	***0.0110***	***0.0100***	***0.0067***	***0.0049***	***0.0044***	***0.0038***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.43E-03	1.11E-03	7.73E-04	5.97E-04	5.03E-04	7.44E-04	1.62E-03	3.86E-03	8.52E-03	7.79E-03	6.38E-03	5.90E-03	4.82E-03	4.35E-03	4.81E-03	5.22E-03	5.62E-03	6.42E-03	7.35E-03	6.66E-03	4.44E-03	3.26E-03	2.95E-03	2.56E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.16E-04	5.57E-04	3.87E-04	2.98E-04	2.51E-04	3.72E-04	8.09E-04	1.93E-03	4.26E-03	3.89E-03	3.19E-03	2.95E-03	2.41E-03	2.18E-03	2.41E-03	2.61E-03	2.81E-03	3.21E-03	3.67E-03	3.33E-03	2.22E-03	1.63E-03	1.48E-03	1.28E-03
	Emission in each Box of 1st jet	g/s	2.86E-04	2.23E-04	1.55E-04	1.19E-04	1.01E-04	1.49E-04	3.24E-04	7.73E-04	1.70E-03	1.56E-03	1.28E-03	1.18E-03	9.63E-04	8.71E-04	9.63E-04	1.04E-03	1.12E-03	1.28E-03	1.47E-03	1.33E-03	8.88E-04	6.52E-04	5.90E-04	5.12E-04
	Emission in each Box of 2nd jet	g/s	2.39E-04	1.86E-04	1.29E-04	9.94E-05	8.38E-05	1.24E-04	2.70E-04	6.44E-04	1.42E-03	1.30E-03	1.06E-03	9.84E-04	8.03E-04	7.26E-04	8.02E-04	8.70E-04	9.36E-04	1.07E-03	1.22E-03	1.11E-03	7.40E-04	5.44E-04	4.92E-04	4.26E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0977	0.0811	0.0827	0.0859	0.0879	0.1680	0.1763	0.1341	0.1606	0.1506	0.1384	0.1352	0.1105	0.1078	0.1115	0.1140	0.1175	0.1252	0.1307	0.1256	0.1056	0.0966	0.0948	0.0922
	NO2	g/vehicle/km	0.0168	0.0160	0.0162	0.0165	0.0167	0.0210	0.0212	0.0201	0.0297	0.0279	0.0252	0.0243	0.0225	0.0217	0.0227	0.0234	0.0241	0.0259	0.0273	0.0262	0.0214	0.0188	0.0182	0.0178
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0113***	***0.0076***	***0.0053***	***0.0041***	***0.0035***	***0.0079***	***0.0175***	***0.0338***	***0.0611***	***0.0556***	***0.0470***	***0.0439***	***0.0318***	***0.0290***	***0.0319***	***0.0343***	***0.0368***	***0.0423***	***0.0468***	***0.0431***	***0.0297***	***0.0221***	***0.0203***	***0.0175***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.50E-03	5.08E-03	3.56E-03	2.73E-03	2.34E-03	5.24E-03	1.17E-02	2.25E-02	4.07E-02	3.71E-02	3.13E-02	2.93E-02	2.12E-02	1.94E-02	2.13E-02	2.28E-02	2.45E-02	2.82E-02	3.12E-02	2.88E-02	1.98E-02	1.47E-02	1.35E-02	1.17E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.75E-03	2.54E-03	1.78E-03	1.37E-03	1.17E-03	2.62E-03	5.84E-03	1.13E-02	2.04E-02	1.85E-02	1.57E-02	1.46E-02	1.06E-02	9.68E-03	1.06E-02	1.14E-02	1.23E-02	1.41E-02	1.56E-02	1.44E-02	9.88E-03	7.36E-03	6.77E-03	5.84E-03
	Emission in each Box of 1st jet	g/s	1.50E-03	1.02E-03	7.13E-04	5.46E-04	4.68E-04	1.05E-03	2.34E-03	4.51E-03	8.15E-03	7.42E-03	6.26E-03	5.86E-03	4.24E-03	3.87E-03	4.25E-03	4.57E-03	4.91E-03	5.64E-03	6.23E-03	5.75E-03	3.95E-03	2.95E-03	2.71E-03	2.34E-03
	Emission in each Box of 2nd jet	g/s	1.25E-03	8.46E-04	5.94E-04	4.55E-04	3.90E-04	8.73E-04	1.95E-03	3.76E-03	6.79E-03	6.18E-03	5.22E-03	4.88E-03	3.54E-03	3.23E-03	3.54E-03	3.81E-03	4.09E-03	4.70E-03	5.19E-03	4.79E-03	3.29E-03	2.45E-03	2.26E-03	1.95E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0010***	***0.0021***	***0.0051***	***0.0113***	***0.0103***	***0.0086***	***0.0079***	***0.0065***	***0.0058***	***0.0065***	***0.0070***	***0.0075***	***0.0087***	***0.0098***	***0.0090***	***0.0060***	***0.0043***	***0.0039***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.29E-03	1.00E-03	6.98E-04	5.26E-04	4.43E-04	6.54E-04	1.41E-03	3.38E-03	7.54E-03	6.86E-03	5.71E-03	5.27E-03	4.33E-03	3.90E-03	4.33E-03	4.68E-03	5.02E-03	5.82E-03	6.51E-03	6.01E-03	4.01E-03	2.86E-03	2.61E-03	2.26E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.46E-04	5.01E-04	3.49E-04	2.63E-04	2.22E-04	3.27E-04	7.03E-04	1.69E-03	3.77E-03	3.43E-03	2.86E-03	2.63E-03	2.16E-03	1.95E-03	2.17E-03	2.34E-03	2.51E-03	2.91E-03	3.26E-03	3.00E-03	2.00E-03	1.43E-03	1.30E-03	1.13E-03
	Emission in each Box of 1st jet	g/s	2.59E-04	2.00E-04	1.40E-04	1.05E-04	8.87E-05	1.31E-04	2.81E-04	6.75E-04	1.51E-03	1.37E-03	1.14E-03	1.05E-03	8.66E-04	7.79E-04	8.67E-04	9.36E-04	1.00E-03	1.16E-03	1.30E-03	1.20E-03	8.02E-04	5.72E-04	5.21E-04	4.51E-04
	Emission in each Box of 2nd jet	g/s	2.15E-04	1.67E-04	1.16E-04	8.76E-05	7.39E-05	1.09E-04	2.34E-04	5.63E-04	1.26E-03	1.14E-03	9.52E-04	8.78E-04	7.21E-04	6.49E-04	7.22E-04	7.80E-04	8.37E-04	9.70E-04	1.09E-03	1.00E-03	6.68E-04	4.77E-04	4.35E-04	3.76E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section 104A01-104A08
Enclosure Involvec 104P1
Road Located 104
Vehicle EF Adopte 104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0941	0.0786	0.0822	0.0854	0.0869	0.1661	0.1722	0.1324	0.1569	0.1502	0.1338	0.1306	0.1060	0.1042	0.1062	0.1101	0.1155	0.1221	0.1283	0.1241	0.1044	0.0960	0.0936	0.0916
	NO2	g/vehicle/km	0.0163	0.0155	0.0161	0.0165	0.0165	0.0208	0.0207	0.0199	0.0291	0.0278	0.0245	0.0236	0.0217	0.0211	0.0218	0.0227	0.0237	0.0253	0.0269	0.0260	0.0212	0.0187	0.0180	0.0177
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0108***	***0.0074***	***0.0053***	***0.0041***	***0.0035***	***0.0078***	***0.0171***	***0.0334***	***0.0597***	***0.0555***	***0.0454***	***0.0424***	***0.0306***	***0.0280***	***0.0304***	***0.0331***	***0.0362***	***0.0412***	***0.0459***	***0.0426***	***0.0293***	***0.0220***	***0.0201***	***0.0174***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.23E-03	4.92E-03	3.54E-03	2.71E-03	2.31E-03	5.18E-03	1.14E-02	2.23E-02	3.98E-02	3.70E-02	3.03E-02	2.83E-02	2.04E-02	1.87E-02	2.03E-02	2.21E-02	2.41E-02	2.75E-02	3.06E-02	2.84E-02	1.95E-02	1.46E-02	1.34E-02	1.16E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.61E-03	2.46E-03	1.77E-03	1.36E-03	1.16E-03	2.59E-03	5.71E-03	1.11E-02	1.99E-02	1.85E-02	1.51E-02	1.41E-02	1.02E-02	9.35E-03	1.01E-02	1.10E-02	1.21E-02	1.37E-02	1.53E-02	1.42E-02	9.76E-03	7.32E-03	6.69E-03	5.80E-03
	Emission in each Box of 1st jet	g/s	1.45E-03	9.84E-04	7.08E-04	5.43E-04	4.62E-04	1.04E-03	2.28E-03	4.45E-03	7.96E-03	7.40E-03	6.06E-03	5.66E-03	4.07E-03	3.74E-03	4.05E-03	4.41E-03	4.82E-03	5.50E-03	6.11E-03	5.68E-03	3.91E-03	2.93E-03	2.68E-03	2.32E-03
	Emission in each Box of 2nd jet	g/s	1.20E-03	8.20E-04	5.90E-04	4.52E-04	3.85E-04	8.63E-04	1.90E-03	3.71E-03	6.63E-03	6.16E-03	5.05E-03	4.72E-03	3.39E-03	3.12E-03	3.38E-03	3.68E-03	4.02E-03	4.58E-03	5.10E-03	4.74E-03	3.25E-03	2.44E-03	2.23E-03	1.93E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0010***	***0.0021***	***0.0050***	***0.0111***	***0.0103***	***0.0083***	***0.0077***	***0.0063***	***0.0057***	***0.0062***	***0.0068***	***0.0074***	***0.0085***	***0.0096***	***0.0089***	***0.0059***	***0.0043***	***0.0039***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.25E-03	9.73E-04	6.94E-04	5.23E-04	4.39E-04	6.48E-04	1.37E-03	3.34E-03	7.39E-03	6.85E-03	5.55E-03	5.11E-03	4.17E-03	3.78E-03	4.15E-03	4.55E-03	4.95E-03	5.69E-03	6.41E-03	5.95E-03	3.97E-03	2.85E-03	2.58E-03	2.24E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.26E-04	4.87E-04	3.47E-04	2.62E-04	2.19E-04	3.24E-04	6.87E-04	1.67E-03	3.70E-03	3.43E-03	2.77E-03	2.56E-03	2.09E-03	1.89E-03	2.08E-03	2.27E-03	2.48E-03	2.85E-03	3.20E-03	2.97E-03	1.98E-03	1.42E-03	1.29E-03	1.12E-03
	Emission in each Box of 1st jet	g/s	2.50E-04	1.95E-04	1.39E-04	1.05E-04	8.77E-05	1.30E-04	2.75E-04	6.68E-04	1.48E-03	1.37E-03	1.11E-03	1.02E-03	8.35E-04	7.57E-04	8.31E-04	9.09E-04	9.90E-04	1.14E-03	1.28E-03	1.19E-03	7.93E-04	5.69E-04	5.16E-04	4.49E-04
	Emission in each Box of 2nd jet	g/s	2.09E-04	1.62E-04	1.16E-04	8.72E-05	7.31E-05	1.08E-04	2.29E-04	5.57E-04	1.23E-03	1.14E-03	9.25E-04	8.52E-04	6.96E-04	6.31E-04	6.92E-04	7.58E-04	8.25E-04	9.49E-04	1.07E-03	9.91E-04	6.61E-04	4.74E-04	4.30E-04	3.74E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104A01-104A08
Enclosure Involvec: 104P1
Road Located: 104
Vehicle EF Adopte: 104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0948	0.0781	0.0796	0.0826	0.0845	0.1608	0.1722	0.1290	0.1531	0.1452	0.1344	0.1323	0.1040	0.1023	0.1075	0.1107	0.1134	0.1218	0.1268	0.1227	0.1025	0.0948	0.0924	0.0892
	NO2	g/vehicle/km	0.0164	0.0155	0.0157	0.0160	0.0161	0.0202	0.0207	0.0194	0.0284	0.0269	0.0246	0.0239	0.0214	0.0207	0.0220	0.0228	0.0233	0.0252	0.0266	0.0257	0.0208	0.0184	0.0178	0.0173
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0109***	***0.0073***	***0.0051***	***0.0039***	***0.0034***	***0.0075***	***0.0171***	***0.0325***	***0.0583***	***0.0537***	***0.0456***	***0.0430***	***0.0300***	***0.0276***	***0.0308***	***0.0333***	***0.0355***	***0.0411***	***0.0454***	***0.0422***	***0.0288***	***0.0217***	***0.0198***	***0.0169***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.28E-03	4.89E-03	3.43E-03	2.63E-03	2.25E-03	5.01E-03	1.14E-02	2.17E-02	3.88E-02	3.58E-02	3.04E-02	2.86E-02	2.00E-02	1.84E-02	2.05E-02	2.22E-02	2.37E-02	2.74E-02	3.02E-02	2.81E-02	1.92E-02	1.45E-02	1.32E-02	1.13E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.64E-03	2.45E-03	1.71E-03	1.31E-03	1.12E-03	2.51E-03	5.71E-03	1.08E-02	1.94E-02	1.79E-02	1.52E-02	1.43E-02	9.99E-03	9.18E-03	1.03E-02	1.11E-02	1.18E-02	1.37E-02	1.51E-02	1.41E-02	9.59E-03	7.23E-03	6.61E-03	5.65E-03
	Emission in each Box of 1st jet	g/s	1.46E-03	9.78E-04	6.86E-04	5.25E-04	4.50E-04	1.00E-03	2.28E-03	4.34E-03	7.77E-03	7.15E-03	6.08E-03	5.73E-03	4.00E-03	3.67E-03	4.10E-03	4.44E-03	4.74E-03	5.48E-03	6.05E-03	5.62E-03	3.84E-03	2.89E-03	2.64E-03	2.26E-03
	Emission in each Box of 2nd jet	g/s	1.21E-03	8.15E-04	5.71E-04	4.38E-04	3.75E-04	8.35E-04	1.90E-03	3.62E-03	6.47E-03	5.96E-03	5.07E-03	4.77E-03	3.33E-03	3.06E-03	3.42E-03	3.70E-03	3.95E-03	4.57E-03	5.04E-03	4.68E-03	3.20E-03	2.41E-03	2.20E-03	1.88E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0006***	***0.0009***	***0.0021***	***0.0049***	***0.0108***	***0.0099***	***0.0083***	***0.0077***	***0.0062***	***0.0056***	***0.0063***	***0.0068***	***0.0073***	***0.0085***	***0.0095***	***0.0088***	***0.0058***	***0.0042***	***0.0038***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.26E-03	9.68E-04	6.75E-04	5.08E-04	4.28E-04	6.29E-04	1.37E-03	3.26E-03	7.21E-03	6.63E-03	5.57E-03	5.17E-03	4.10E-03	3.72E-03	4.20E-03	4.56E-03	4.86E-03	5.67E-03	6.34E-03	5.88E-03	3.89E-03	2.81E-03	2.55E-03	2.19E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.29E-04	4.84E-04	3.37E-04	2.54E-04	2.14E-04	3.15E-04	6.87E-04	1.63E-03	3.60E-03	3.31E-03	2.78E-03	2.58E-03	2.05E-03	1.86E-03	2.10E-03	2.28E-03	2.43E-03	2.84E-03	3.17E-03	2.94E-03	1.94E-03	1.41E-03	1.27E-03	1.10E-03
	Emission in each Box of 1st jet	g/s	2.52E-04	1.94E-04	1.35E-04	1.02E-04	8.57E-05	1.26E-04	2.75E-04	6.52E-04	1.44E-03	1.33E-03	1.11E-03	1.03E-03	8.21E-04	7.44E-04	8.40E-04	9.13E-04	9.73E-04	1.13E-03	1.27E-03	1.18E-03	7.78E-04	5.63E-04	5.10E-04	4.39E-04
	Emission in each Box of 2nd jet	g/s	2.10E-04	1.61E-04	1.12E-04	8.47E-05	7.14E-05	1.05E-04	2.29E-04	5.44E-04	1.20E-03	1.10E-03	9.28E-04	8.61E-04	6.84E-04	6.20E-04	7.00E-04	7.61E-04	8.11E-04	9.45E-04	1.06E-03	9.80E-04	6.48E-04	4.69E-04	4.25E-04	3.65E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104A01-104A08
Enclosure Involved: 104P1
Road Located: 104
Vehicle EF Adopted: 104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0960	0.0797	0.0813	0.0844	0.0863	0.1642	0.1757	0.1324	0.1550	0.1457	0.1365	0.1324	0.1060	0.1042	0.1069	0.1101	0.1162	0.1213	0.1306	0.1226	0.1026	0.0948	0.0925	0.0904
	NO2	g/vehicle/km	0.0166	0.0158	0.0160	0.0163	0.0164	0.0206	0.0211	0.0199	0.0287	0.0270	0.0250	0.0239	0.0217	0.0211	0.0219	0.0227	0.0239	0.0251	0.0273	0.0257	0.0208	0.0185	0.0178	0.0175
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0111***	***0.0075***	***0.0053***	***0.0040***	***0.0034***	***0.0077***	***0.0175***	***0.0334***	***0.0590***	***0.0538***	***0.0464***	***0.0430***	***0.0306***	***0.0280***	***0.0306***	***0.0331***	***0.0364***	***0.0410***	***0.0467***	***0.0421***	***0.0288***	***0.0217***	***0.0198***	***0.0172***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.37E-03	4.99E-03	3.50E-03	2.68E-03	2.30E-03	5.12E-03	1.16E-02	2.23E-02	3.93E-02	3.59E-02	3.09E-02	2.87E-02	2.04E-02	1.87E-02	2.04E-02	2.21E-02	2.43E-02	2.73E-02	3.11E-02	2.81E-02	1.92E-02	1.45E-02	1.32E-02	1.15E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.69E-03	2.50E-03	1.75E-03	1.34E-03	1.15E-03	2.56E-03	5.82E-03	1.11E-02	1.97E-02	1.79E-02	1.55E-02	1.43E-02	1.02E-02	9.35E-03	1.02E-02	1.10E-02	1.21E-02	1.37E-02	1.56E-02	1.40E-02	9.60E-03	7.23E-03	6.61E-03	5.73E-03
	Emission in each Box of 1st jet	g/s	1.47E-03	9.98E-04	7.00E-04	5.37E-04	4.59E-04	1.02E-03	2.33E-03	4.45E-03	7.86E-03	7.18E-03	6.18E-03	5.74E-03	4.07E-03	3.74E-03	4.08E-03	4.41E-03	4.85E-03	5.46E-03	6.23E-03	5.62E-03	3.84E-03	2.89E-03	2.64E-03	2.29E-03
	Emission in each Box of 2nd jet	g/s	1.23E-03	8.32E-04	5.83E-04	4.47E-04	3.83E-04	8.53E-04	1.94E-03	3.71E-03	6.55E-03	5.98E-03	5.15E-03	4.78E-03	3.39E-03	3.12E-03	3.40E-03	3.68E-03	4.04E-03	4.55E-03	5.19E-03	4.68E-03	3.20E-03	2.41E-03	2.20E-03	1.91E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0010***	***0.0021***	***0.0050***	***0.0109***	***0.0100***	***0.0085***	***0.0078***	***0.0063***	***0.0057***	***0.0063***	***0.0068***	***0.0075***	***0.0085***	***0.0098***	***0.0088***	***0.0058***	***0.0042***	***0.0038***	***0.0033***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.27E-03	9.86E-04	6.87E-04	5.18E-04	4.37E-04	6.41E-04	1.40E-03	3.34E-03	7.29E-03	6.65E-03	5.65E-03	5.18E-03	4.17E-03	3.78E-03	4.18E-03	4.55E-03	4.98E-03	5.66E-03	6.51E-03	5.88E-03	3.89E-03	2.82E-03	2.55E-03	2.22E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.37E-04	4.93E-04	3.43E-04	2.59E-04	2.18E-04	3.21E-04	7.00E-04	1.67E-03	3.65E-03	3.32E-03	2.82E-03	2.59E-03	2.09E-03	1.89E-03	2.09E-03	2.27E-03	2.49E-03	2.83E-03	3.26E-03	2.94E-03	1.95E-03	1.41E-03	1.27E-03	1.11E-03
	Emission in each Box of 1st jet	g/s	2.55E-04	1.97E-04	1.37E-04	1.04E-04	8.73E-05	1.28E-04	2.80E-04	6.68E-04	1.46E-03	1.33E-03	1.13E-03	1.04E-03	8.35E-04	7.57E-04	8.36E-04	9.09E-04	9.96E-04	1.13E-03	1.30E-03	1.18E-03	7.78E-04	5.63E-04	5.10E-04	4.44E-04
	Emission in each Box of 2nd jet	g/s	2.12E-04	1.64E-04	1.14E-04	8.63E-05	7.28E-05	1.07E-04	2.33E-04	5.57E-04	1.22E-03	1.11E-03	9.42E-04	8.63E-04	6.96E-04	6.31E-04	6.97E-04	7.58E-04	8.30E-04	9.43E-04	1.09E-03	9.81E-04	6.49E-04	4.69E-04	4.25E-04	3.70E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104A01-104A08
Enclosure Involvec: 104P1
Road Located: 104
Vehicle EF Adopte: 104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0953	0.0791	0.0806	0.0832	0.0879	0.1670	0.1776	0.1307	0.1563	0.1474	0.1384	0.1324	0.1074	0.1070	0.1091	0.1131	0.1151	0.1209	0.1299	0.1211	0.1056	0.0972	0.0948	0.0927
	NO2	g/vehicle/km	0.0165	0.0156	0.0158	0.0161	0.0167	0.0209	0.0213	0.0196	0.0290	0.0273	0.0252	0.0238	0.0220	0.0216	0.0223	0.0232	0.0236	0.0250	0.0272	0.0254	0.0214	0.0189	0.0182	0.0179
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0110***	***0.0074***	***0.0052***	***0.0040***	***0.0035***	***0.0078***	***0.0177***	***0.0330***	***0.0595***	***0.0544***	***0.0470***	***0.0430***	***0.0310***	***0.0288***	***0.0312***	***0.0340***	***0.0360***	***0.0408***	***0.0465***	***0.0416***	***0.0297***	***0.0222***	***0.0203***	***0.0176***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.32E-03	4.95E-03	3.47E-03	2.64E-03	2.34E-03	5.21E-03	1.18E-02	2.20E-02	3.97E-02	3.63E-02	3.13E-02	2.87E-02	2.06E-02	1.92E-02	2.08E-02	2.27E-02	2.40E-02	2.72E-02	3.10E-02	2.77E-02	1.98E-02	1.48E-02	1.35E-02	1.17E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.66E-03	2.48E-03	1.74E-03	1.32E-03	1.17E-03	2.60E-03	5.89E-03	1.10E-02	1.98E-02	1.81E-02	1.57E-02	1.43E-02	1.03E-02	9.61E-03	1.04E-02	1.13E-02	1.20E-02	1.36E-02	1.55E-02	1.39E-02	9.88E-03	7.41E-03	6.77E-03	5.87E-03
	Emission in each Box of 1st jet	g/s	1.46E-03	9.91E-04	6.94E-04	5.29E-04	4.68E-04	1.04E-03	2.36E-03	4.39E-03	7.93E-03	7.26E-03	6.26E-03	5.73E-03	4.13E-03	3.84E-03	4.16E-03	4.53E-03	4.81E-03	5.45E-03	6.19E-03	5.55E-03	3.95E-03	2.96E-03	2.71E-03	2.35E-03
	Emission in each Box of 2nd jet	g/s	1.22E-03	8.26E-04	5.79E-04	4.41E-04	3.90E-04	8.68E-04	1.96E-03	3.66E-03	6.61E-03	6.05E-03	5.22E-03	4.78E-03	3.44E-03	3.20E-03	3.47E-03	3.78E-03	4.00E-03	4.54E-03	5.16E-03	4.62E-03	3.29E-03	2.47E-03	2.26E-03	1.96E-03
NO_2 Emission Rate		g/s	***0.0019***	***0.0015***	***0.0010***	***0.0008***	***0.0007***	***0.0010***	***0.0021***	***0.0049***	***0.0110***	***0.0101***	***0.0086***	***0.0077***	***0.0063***	***0.0058***	***0.0064***	***0.0070***	***0.0074***	***0.0085***	***0.0097***	***0.0087***	***0.0060***	***0.0043***	***0.0039***	***0.0034***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.26E-03	9.79E-04	6.82E-04	5.11E-04	4.43E-04	6.51E-04	1.41E-03	3.30E-03	7.36E-03	6.73E-03	5.71E-03	5.16E-03	4.22E-03	3.87E-03	4.25E-03	4.65E-03	4.93E-03	5.64E-03	6.48E-03	5.82E-03	4.01E-03	2.88E-03	2.61E-03	2.27E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.32E-04	4.89E-04	3.41E-04	2.56E-04	2.22E-04	3.26E-04	7.07E-04	1.65E-03	3.68E-03	3.36E-03	2.86E-03	2.58E-03	2.11E-03	1.94E-03	2.13E-03	2.33E-03	2.46E-03	2.82E-03	3.24E-03	2.91E-03	2.00E-03	1.44E-03	1.30E-03	1.13E-03
	Emission in each Box of 1st jet	g/s	2.53E-04	1.96E-04	1.36E-04	1.02E-04	8.87E-05	1.30E-04	2.83E-04	6.60E-04	1.47E-03	1.35E-03	1.14E-03	1.03E-03	8.44E-04	7.75E-04	8.51E-04	9.30E-04	9.85E-04	1.13E-03	1.30E-03	1.16E-03	8.02E-04	5.75E-04	5.21E-04	4.54E-04
	Emission in each Box of 2nd jet	g/s	2.11E-04	1.63E-04	1.14E-04	8.52E-05	7.39E-05	1.09E-04	2.36E-04	5.50E-04	1.23E-03	1.12E-03	9.52E-04	8.61E-04	7.03E-04	6.45E-04	7.09E-04	7.75E-04	8.21E-04	9.39E-04	1.08E-03	9.69E-04	6.68E-04	4.79E-04	4.35E-04	3.78E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involved	104P1
Road Located	104
Vehicle EF Adopted	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1080	0.0904	0.0918	0.0955	0.0973	0.1849	0.1974	0.1505	0.1776	0.1674	0.1509	0.1479	0.1207	0.1177	0.1209	0.1247	0.1285	0.1348	0.1459	0.1380	0.1169	0.1082	0.1057	0.1029
	NO2	g/vehicle/km	0.0185	0.0176	0.0178	0.0182	0.0182	0.0230	0.0236	0.0224	0.0327	0.0307	0.0274	0.0265	0.0244	0.0236	0.0245	0.0255	0.0262	0.0277	0.0303	0.0287	0.0235	0.0208	0.0202	0.0197
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0124***	***0.0085***	***0.0059***	***0.0046***	***0.0039***	***0.0086***	***0.0196***	***0.0380***	***0.0676***	***0.0619***	***0.0512***	***0.0481***	***0.0348***	***0.0317***	***0.0346***	***0.0375***	***0.0403***	***0.0455***	***0.0522***	***0.0474***	***0.0328***	***0.0247***	***0.0227***	***0.0196***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.29E-03	5.66E-03	3.95E-03	3.04E-03	2.59E-03	5.76E-03	1.31E-02	2.53E-02	4.51E-02	4.12E-02	3.42E-02	3.20E-02	2.32E-02	2.11E-02	2.31E-02	2.50E-02	2.68E-02	3.03E-02	3.48E-02	3.16E-02	2.19E-02	1.65E-02	1.51E-02	1.30E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.15E-03	2.83E-03	1.98E-03	1.52E-03	1.29E-03	2.88E-03	6.54E-03	1.27E-02	2.25E-02	2.06E-02	1.71E-02	1.60E-02	1.16E-02	1.06E-02	1.15E-02	1.25E-02	1.34E-02	1.52E-02	1.74E-02	1.58E-02	1.09E-02	8.25E-03	7.55E-03	6.52E-03
	Emission in each Box of 1st jet	g/s	1.66E-03	1.13E-03	7.90E-04	6.07E-04	5.18E-04	1.15E-03	2.62E-03	5.06E-03	9.01E-03	8.25E-03	6.83E-03	6.41E-03	4.64E-03	4.23E-03	4.62E-03	5.00E-03	5.37E-03	6.07E-03	6.95E-03	6.32E-03	4.38E-03	3.30E-03	3.02E-03	2.61E-03
	Emission in each Box of 2nd jet	g/s	1.38E-03	9.44E-04	6.59E-04	5.06E-04	4.31E-04	9.61E-04	2.18E-03	4.22E-03	7.51E-03	6.87E-03	5.69E-03	5.34E-03	3.87E-03	3.52E-03	3.85E-03	4.16E-03	4.47E-03	5.06E-03	5.80E-03	5.27E-03	3.65E-03	2.75E-03	2.52E-03	2.17E-03
NO_2 Emission Rate		g/s	***0.0021***	***0.0017***	***0.0011***	***0.0009***	***0.0007***	***0.0011***	***0.0023***	***0.0056***	***0.0124***	***0.0114***	***0.0093***	***0.0086***	***0.0070***	***0.0063***	***0.0070***	***0.0077***	***0.0082***	***0.0094***	***0.0108***	***0.0098***	***0.0066***	***0.0048***	***0.0043***	***0.0037***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.42E-03	1.10E-03	7.66E-04	5.78E-04	4.84E-04	7.17E-04	1.56E-03	3.76E-03	8.30E-03	7.57E-03	6.21E-03	5.74E-03	4.70E-03	4.23E-03	4.67E-03	5.10E-03	5.47E-03	6.24E-03	7.22E-03	6.56E-03	4.39E-03	3.18E-03	2.88E-03	2.50E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.10E-04	5.52E-04	3.83E-04	2.89E-04	2.42E-04	3.58E-04	7.82E-04	1.88E-03	4.15E-03	3.78E-03	3.10E-03	2.87E-03	2.35E-03	2.12E-03	2.34E-03	2.55E-03	2.74E-03	3.12E-03	3.61E-03	3.28E-03	2.20E-03	1.59E-03	1.44E-03	1.25E-03
	Emission in each Box of 1st jet	g/s	2.84E-04	2.21E-04	1.53E-04	1.16E-04	9.68E-05	1.43E-04	3.13E-04	7.53E-04	1.66E-03	1.51E-03	1.24E-03	1.15E-03	9.39E-04	8.46E-04	9.35E-04	1.02E-03	1.09E-03	1.25E-03	1.44E-03	1.31E-03	8.78E-04	6.35E-04	5.77E-04	5.00E-04
	Emission in each Box of 2nd jet	g/s	2.37E-04	1.84E-04	1.28E-04	9.64E-05	8.07E-05	1.19E-04	2.61E-04	6.27E-04	1.38E-03	1.26E-03	1.03E-03	9.57E-04	7.83E-04	7.05E-04	7.79E-04	8.50E-04	9.12E-04	1.04E-03	1.20E-03	1.09E-03	7.32E-04	5.29E-04	4.81E-04	4.17E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104A01-104A08
Enclosure Involvec	104P1
Road Located	104
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1189	0.1011	0.1028	0.1080	0.1104	0.2091	0.2227	0.1696	0.2006	0.1897	0.1710	0.1666	0.1341	0.1308	0.1343	0.1387	0.1421	0.1518	0.1608	0.1546	0.1303	0.1206	0.1179	0.1154
	NO2	g/vehicle/km	0.0201	0.0194	0.0196	0.0202	0.0203	0.0257	0.0263	0.0250	0.0366	0.0346	0.0308	0.0296	0.0270	0.0260	0.0270	0.0280	0.0288	0.0309	0.0332	0.0318	0.0259	0.0230	0.0223	0.0219
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0137***	***0.0095***	***0.0066***	***0.0051***	***0.0044***	***0.0098***	***0.0221***	***0.0428***	***0.0764***	***0.0701***	***0.0581***	***0.0541***	***0.0386***	***0.0352***	***0.0384***	***0.0417***	***0.0445***	***0.0513***	***0.0575***	***0.0531***	***0.0366***	***0.0276***	***0.0253***	***0.0219***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.13E-03	6.33E-03	4.43E-03	3.43E-03	2.94E-03	6.52E-03	1.48E-02	2.85E-02	5.09E-02	4.67E-02	3.87E-02	3.61E-02	2.58E-02	2.35E-02	2.56E-02	2.78E-02	2.97E-02	3.42E-02	3.83E-02	3.54E-02	2.44E-02	1.84E-02	1.69E-02	1.46E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.56E-03	3.16E-03	2.21E-03	1.72E-03	1.47E-03	3.26E-03	7.38E-03	1.43E-02	2.55E-02	2.34E-02	1.94E-02	1.80E-02	1.29E-02	1.17E-02	1.28E-02	1.39E-02	1.48E-02	1.71E-02	1.92E-02	1.77E-02	1.22E-02	9.19E-03	8.43E-03	7.31E-03
	Emission in each Box of 1st jet	g/s	1.83E-03	1.27E-03	8.85E-04	6.86E-04	5.87E-04	1.30E-03	2.95E-03	5.70E-03	1.02E-02	9.34E-03	7.74E-03	7.22E-03	5.15E-03	4.70E-03	5.13E-03	5.56E-03	5.94E-03	6.83E-03	7.67E-03	7.08E-03	4.88E-03	3.68E-03	3.37E-03	2.92E-03
	Emission in each Box of 2nd jet	g/s	1.52E-03	1.05E-03	7.38E-04	5.72E-04	4.89E-04	1.09E-03	2.46E-03	4.75E-03	8.48E-03	7.79E-03	6.45E-03	6.01E-03	4.29E-03	3.91E-03	4.27E-03	4.63E-03	4.95E-03	5.70E-03	6.39E-03	5.90E-03	4.06E-03	3.06E-03	2.81E-03	2.44E-03
NO_2 Emission Rate		g/s	***0.0023***	***0.0018***	***0.0013***	***0.0010***	***0.0008***	***0.0012***	***0.0026***	***0.0063***	***0.0139***	***0.0128***	***0.0105***	***0.0096***	***0.0078***	***0.0070***	***0.0077***	***0.0084***	***0.0090***	***0.0104***	***0.0119***	***0.0109***	***0.0073***	***0.0053***	***0.0048***	***0.0042***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-03	1.21E-03	8.43E-04	6.42E-04	5.41E-04	8.01E-04	1.75E-03	4.20E-03	9.28E-03	8.51E-03	6.97E-03	6.41E-03	5.18E-03	4.66E-03	5.15E-03	5.62E-03	6.01E-03	6.97E-03	7.90E-03	7.28E-03	4.85E-03	3.51E-03	3.19E-03	2.78E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.72E-04	6.07E-04	4.22E-04	3.21E-04	2.71E-04	4.00E-04	8.73E-04	2.10E-03	4.64E-03	4.26E-03	3.49E-03	3.21E-03	2.59E-03	2.33E-03	2.58E-03	2.81E-03	3.00E-03	3.48E-03	3.95E-03	3.64E-03	2.42E-03	1.75E-03	1.59E-03	1.39E-03
	Emission in each Box of 1st jet	g/s	3.09E-04	2.43E-04	1.69E-04	1.28E-04	1.08E-04	1.60E-04	3.49E-04	8.40E-04	1.86E-03	1.70E-03	1.39E-03	1.28E-03	1.04E-03	9.33E-04	1.03E-03	1.12E-03	1.20E-03	1.39E-03	1.58E-03	1.46E-03	9.70E-04	7.02E-04	6.38E-04	5.55E-04
	Emission in each Box of 2nd jet	g/s	2.57E-04	2.02E-04	1.41E-04	1.07E-04	9.02E-05	1.33E-04	2.91E-04	7.00E-04	1.55E-03	1.42E-03	1.16E-03	1.07E-03	8.63E-04	7.77E-04	8.59E-04	9.36E-04	1.00E-03	1.16E-03	1.32E-03	1.21E-03	8.08E-04	5.85E-04	5.31E-04	4.63E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104A01-104A08
Enclosure Involved: 104P1
Road Located: 104
Vehicle EF Adopted: 104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1498	1221	840	620	519	608	1293	3279	4949	4804	4416	4225	3748	3502	3722	3909	4073	4392	4650	4468	3650	2974	2789	2472
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1258	0.1062	0.1080	0.1128	0.1168	0.2194	0.2329	0.1774	0.2097	0.1980	0.1778	0.1736	0.1393	0.1360	0.1400	0.1442	0.1478	0.1574	0.1687	0.1600	0.1354	0.1251	0.1241	0.1214
	NO2	g/vehicle/km	0.0211	0.0202	0.0204	0.0210	0.0213	0.0268	0.0274	0.0260	0.0380	0.0358	0.0319	0.0307	0.0280	0.0270	0.0281	0.0291	0.0298	0.0319	0.0346	0.0328	0.0268	0.0237	0.0232	0.0228
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83	276.83
	Number of 1st 50m Box	#	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0145***	***0.0100***	***0.0070***	***0.0054***	***0.0047***	***0.0103***	***0.0232***	***0.0447***	***0.0798***	***0.0731***	***0.0604***	***0.0564***	***0.0401***	***0.0366***	***0.0401***	***0.0434***	***0.0463***	***0.0532***	***0.0603***	***0.0550***	***0.0380***	***0.0286***	***0.0266***	***0.0231***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.66E-03	6.65E-03	4.65E-03	3.59E-03	3.11E-03	6.84E-03	1.54E-02	2.98E-02	5.32E-02	4.88E-02	4.03E-02	3.76E-02	2.68E-02	2.44E-02	2.67E-02	2.89E-02	3.09E-02	3.54E-02	4.02E-02	3.67E-02	2.53E-02	1.91E-02	1.77E-02	1.54E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.83E-03	3.32E-03	2.33E-03	1.79E-03	1.55E-03	3.42E-03	7.72E-03	1.49E-02	2.66E-02	2.44E-02	2.01E-02	1.88E-02	1.34E-02	1.22E-02	1.34E-02	1.45E-02	1.54E-02	1.77E-02	2.01E-02	1.83E-02	1.27E-02	9.54E-03	8.87E-03	7.69E-03
	Emission in each Box of 1st jet	g/s	1.93E-03	1.33E-03	9.30E-04	7.17E-04	6.22E-04	1.37E-03	3.09E-03	5.96E-03	1.06E-02	9.75E-03	8.05E-03	7.52E-03	5.35E-03	4.88E-03	5.34E-03	5.78E-03	6.17E-03	7.09E-03	8.04E-03	7.33E-03	5.07E-03	3.82E-03	3.55E-03	3.08E-03
	Emission in each Box of 2nd jet	g/s	1.61E-03	1.11E-03	7.75E-04	5.98E-04	5.18E-04	1.14E-03	2.57E-03	4.97E-03	8.87E-03	8.13E-03	6.71E-03	6.27E-03	4.46E-03	4.07E-03	4.45E-03	4.82E-03	5.14E-03	5.91E-03	6.70E-03	6.11E-03	4.22E-03	3.18E-03	2.96E-03	2.56E-03
NO_2 Emission Rate		g/s	***0.0024***	***0.0019***	***0.0013***	***0.0010***	***0.0009***	***0.0013***	***0.0027***	***0.0066***	***0.0145***	***0.0132***	***0.0108***	***0.0100***	***0.0081***	***0.0073***	***0.0080***	***0.0088***	***0.0093***	***0.0108***	***0.0124***	***0.0113***	***0.0075***	***0.0054***	***0.0050***	***0.0043***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.62E-03	1.27E-03	8.80E-04	6.66E-04	5.67E-04	8.36E-04	1.82E-03	4.37E-03	9.64E-03	8.82E-03	7.22E-03	6.65E-03	5.37E-03	4.84E-03	5.36E-03	5.83E-03	6.21E-03	7.19E-03	8.24E-03	7.51E-03	5.02E-03	3.61E-03	3.32E-03	2.89E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.11E-04	6.33E-04	4.40E-04	3.33E-04	2.84E-04	4.18E-04	9.08E-04	2.18E-03	4.82E-03	4.41E-03	3.61E-03	3.32E-03	2.69E-03	2.42E-03	2.68E-03	2.92E-03	3.11E-03	3.59E-03	4.12E-03	3.75E-03	2.51E-03	1.81E-03	1.66E-03	1.44E-03
	Emission in each Box of 1st jet	g/s	3.25E-04	2.53E-04	1.76E-04	1.33E-04	1.13E-04	1.67E-04	3.63E-04	8.74E-04	1.93E-03	1.76E-03	1.44E-03	1.33E-03	1.07E-03	9.68E-04	1.07E-03	1.17E-03	1.24E-03	1.44E-03	1.65E-03	1.50E-03	1.00E-03	7.23E-04	6.64E-04	5.78E-04
	Emission in each Box of 2nd jet	g/s	2.70E-04	2.11E-04	1.47E-04	1.11E-04	9.45E-05	1.39E-04	3.03E-04	7.28E-04	1.61E-03	1.47E-03	1.20E-03	1.11E-03	8.96E-04	8.06E-04	8.93E-04	9.72E-04	1.04E-03	1.20E-03	1.37E-03	1.25E-03	8.36E-04	6.02E-04	5.53E-04	4.82E-04
RSP Emission Rate		g/s	***9.85E-04***	***6.69E-04***	***4.72E-04***	***3.64E-04***	***3.13E-04***	***7.04E-04***	***1.59E-03***	***2.94E-03***	***4.52E-03***	***4.20E-03***	***3.66E-03***	***3.45E-03***	***2.52E-03***	***2.35E-03***	***2.51E-03***	***2.68E-03***	***2.79E-03***	***3.15E-03***	***3.46E-03***	***3.20E-03***	***2.39E-03***	***1.91E-03***	***1.79E-03***	***1.55E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	6.57E-04	4.46E-04	3.15E-04	2.43E-04	2.09E-04	4.69E-04	1.06E-03	1.96E-03	3.01E-03	2.80E-03	2.44E-03	2.30E-03	1.68E-03	1.57E-03	1.67E-03	1.79E-03	1.86E-03	2.10E-03	2.31E-03	2.13E-03	1.59E-03	1.28E-03	1.19E-03	1.03E-03
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.28E-04	2.23E-04	1.57E-04	1.21E-04	1.04E-04	2.35E-04	5.31E-04	9.81E-04	1.51E-03	1.40E-03	1.22E-03	1.15E-03	8.39E-04	7.84E-04	8.36E-04	8.94E-04	9.32E-04	1.05E-03	1.15E-03	1.07E-03	7.96E-04	6.38E-04	5.96E-04	5.15E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	8.92E-05	6.29E-05	4.85E-05	4.18E-05	9.39E-05	2.12E-04	3.92E-04	6.02E-04	5.60E-04	4.88E-04	4.59E-04	3.36E-04	3.14E-04	3.34E-04	3.57E-04	3.73E-04	4.19E-04	4.62E-04	4.26E-04	3.18E-04	2.55E-04	2.38E-04	2.06E-04
	Emission in each Box of 2nd jet	g/s	1.09E-04	7.43E-05	5.24E-05	4.05E-05	3.48E-05	7.82E-05	1.77E-04	3.27E-04	5.02E-04	4.66E-04	4.06E-04	3.83E-04	2.80E-04	2.61E-04	2.79E-04	2.98E-04	3.11E-04	3.50E-04	3.85E-04	3.55E-04	2.65E-04	2.13E-04	1.99E-04	1.72E-04
FSP Emission Rate		g/s	***9.07E-04***	***6.16E-04***	***4.35E-04***	***3.35E-04***	***2.86E-04***	***6.48E-04***	***1.47E-03***	***2.70E-03***	***4.16E-03***	***3.86E-03***	***3.38E-03***	***3.18E-03***	***2.32E-03***	***2.15E-03***	***2.31E-03***	***2.48E-03***	***2.58E-03***	***2.89E-03***	***3.19E-03***	***2.95E-03***	***2.20E-03***	***1.76E-03***	***1.63E-03***	***1.42E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	6.05E-04	4.10E-04	2.90E-04	2.24E-04	1.91E-04	4.32E-04	9.77E-04	1.80E-03	2.77E-03	2.57E-03	2.25E-03	2.12E-03	1.55E-03	1.44E-03	1.54E-03	1.65E-03	1.72E-03	1.93E-03	2.12E-03	1.97E-03	1.47E-03	1.18E-03	1.09E-03	9.49E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.02E-04	2.05E-04	1.45E-04	1.12E-04	9.54E-05	2.16E-04	4.88E-04	8.99E-04	1.39E-03	1.29E-03	1.13E-03	1.06E-03	7.74E-04	7.18E-04	7.71E-04	8.25E-04	8.61E-04	9.63E-04	1.06E-03	9.84E-04	7.34E-04	5.88E-04	5.44E-04	4.75E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.21E-05	5.80E-05	4.47E-05	3.81E-05	8.64E-05	1.95E-04	3.60E-04	5.55E-04	5.15E-04	4.50E-04	4.25E-04	3.10E-04	2.87E-04	3.08E-04	3.30E-04	3.44E-04	3.85E-04	4.25E-04	3.94E-04	2.93E-04	2.35E-04	2.18E-04	1.90E-04
	Emission in each Box of 2nd jet	g/s	1.01E-04	6.84E-05	4.83E-05	3.73E-05	3.18E-05	7.20E-05	1.63E-04	3.00E-04	4.62E-04	4.29E-04	3.75E-04	3.54E-04	2.58E-04	2.39E-04	2.57E-04	2.75E-04	2.87E-04	3.21E-04	3.54E-04	3.28E-04	2.45E-04	1.96E-04	1.81E-04	1.58E-04
Initial Lateral Dimension		σy	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581	5.581
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 80m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the remaining 30m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1329	0.1129	0.1152	0.1202	0.1230	0.2301	0.2461	0.1862	0.2212	0.2091	0.1897	0.1835	0.1490	0.1449	0.1474	0.1536	0.1577	0.1670	0.1778	0.1688	0.1430	0.1322	0.1310	0.1279
	NO2	g/vehicle/km	0.0221	0.0212	0.0215	0.0220	0.0222	0.0280	0.0288	0.0271	0.0398	0.0375	0.0338	0.0322	0.0297	0.0284	0.0294	0.0308	0.0315	0.0336	0.0361	0.0343	0.0281	0.0248	0.0243	0.0239
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0020***	***0.0014***	***0.0010***	***0.0007***	***0.0006***	***0.0015***	***0.0034***	***0.0062***	***0.0109***	***0.0100***	***0.0083***	***0.0077***	***0.0073***	***0.0066***	***0.0071***	***0.0078***	***0.0084***	***0.0096***	***0.0108***	***0.0098***	***0.0068***	***0.0051***	***0.0048***	***0.0041***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.32E-03	9.04E-04	6.36E-04	4.94E-04	4.20E-04	9.76E-04	2.24E-03	4.11E-03	7.26E-03	6.66E-03	5.55E-03	5.14E-03	4.85E-03	4.41E-03	4.76E-03	5.21E-03	5.58E-03	6.38E-03	7.18E-03	6.55E-03	4.54E-03	3.43E-03	3.19E-03	2.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.59E-04	4.52E-04	3.18E-04	2.47E-04	2.10E-04	4.88E-04	1.12E-03	2.05E-03	3.63E-03	3.33E-03	2.78E-03	2.57E-03	2.42E-03	2.21E-03	2.38E-03	2.61E-03	2.79E-03	3.19E-03	3.59E-03	3.28E-03	2.27E-03	1.71E-03	1.59E-03	1.37E-03
	Emission in each Box of 1st jet	g/s	1.65E-04	1.13E-04	7.95E-05	6.17E-05	5.25E-05	1.22E-04	2.80E-04	5.14E-04	9.08E-04	8.32E-04	6.94E-04	6.43E-04	6.06E-04	5.51E-04	5.95E-04	6.52E-04	6.98E-04	7.97E-04	8.97E-04	8.19E-04	5.68E-04	4.29E-04	3.98E-04	3.43E-04
	Emission in each Box of 2nd jet	g/s	9.41E-05	6.46E-05	4.54E-05	3.53E-05	3.00E-05	6.97E-05	1.60E-04	2.93E-04	5.19E-04	4.75E-04	3.97E-04	3.67E-04	3.46E-04	3.15E-04	3.40E-04	3.72E-04	3.99E-04	4.55E-04	5.13E-04	4.68E-04	3.24E-04	2.45E-04	2.28E-04	1.96E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0020***	***0.0018***	***0.0015***	***0.0014***	***0.0014***	***0.0013***	***0.0014***	***0.0016***	***0.0017***	***0.0019***	***0.0022***	***0.0020***	***0.0013***	***0.0010***	***0.0009***	***0.0008***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.19E-04	1.70E-04	1.19E-04	9.05E-05	7.60E-05	1.19E-04	2.62E-04	5.98E-04	1.31E-03	1.19E-03	9.89E-04	9.04E-04	9.65E-04	8.65E-04	9.48E-04	1.04E-03	1.11E-03	1.28E-03	1.46E-03	1.33E-03	8.92E-04	6.44E-04	5.92E-04	5.12E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.10E-04	8.50E-05	5.93E-05	4.53E-05	3.80E-05	5.94E-05	1.31E-04	2.99E-04	6.53E-04	5.97E-04	4.94E-04	4.52E-04	4.82E-04	4.33E-04	4.74E-04	5.22E-04	5.57E-04	6.41E-04	7.30E-04	6.66E-04	4.46E-04	3.22E-04	2.96E-04	2.56E-04
	Emission in each Box of 1st jet	g/s	2.74E-05	2.12E-05	1.48E-05	1.13E-05	9.50E-06	1.48E-05	3.27E-05	7.48E-05	1.63E-04	1.49E-04	1.24E-04	1.13E-04	1.21E-04	1.08E-04	1.19E-04	1.31E-04	1.39E-04	1.60E-04	1.82E-04	1.66E-04	1.11E-04	8.06E-05	7.40E-05	6.40E-05
	Emission in each Box of 2nd jet	g/s	1.57E-05	1.21E-05	8.47E-06	6.47E-06	5.43E-06	8.48E-06	1.87E-05	4.27E-05	9.32E-05	8.54E-05	7.06E-05	6.46E-05	6.89E-05	6.18E-05	6.77E-05	7.46E-05	7.96E-05	9.16E-05	1.04E-04	9.51E-05	6.37E-05	4.60E-05	4.23E-05	3.66E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104B01-104B15
Enclosure Involved: 104P2
Road Located: 106
Vehicle EF Adopted: 104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1237	0.1039	0.1057	0.1118	0.1143	0.2147	0.2275	0.1736	0.2043	0.1905	0.1742	0.1685	0.1368	0.1340	0.1375	0.1420	0.1455	0.1549	0.1647	0.1577	0.1334	0.1236	0.1209	0.1180
	NO2	g/vehicle/km	0.0208	0.0198	0.0200	0.0207	0.0209	0.0263	0.0268	0.0255	0.0371	0.0347	0.0313	0.0299	0.0275	0.0265	0.0277	0.0287	0.0294	0.0315	0.0339	0.0323	0.0265	0.0234	0.0227	0.0223
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0018***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0014***	***0.0031***	***0.0057***	***0.0101***	***0.0091***	***0.0076***	***0.0071***	***0.0067***	***0.0061***	***0.0067***	***0.0072***	***0.0077***	***0.0089***	***0.0100***	***0.0092***	***0.0064***	***0.0048***	***0.0044***	***0.0038***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.23E-03	8.32E-04	5.83E-04	4.59E-04	3.90E-04	9.11E-04	2.07E-03	3.83E-03	6.70E-03	6.06E-03	5.10E-03	4.72E-03	4.45E-03	4.08E-03	4.44E-03	4.82E-03	5.15E-03	5.91E-03	6.65E-03	6.12E-03	4.24E-03	3.21E-03	2.94E-03	2.53E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.13E-04	4.16E-04	2.92E-04	2.30E-04	1.95E-04	4.55E-04	1.03E-03	1.92E-03	3.35E-03	3.03E-03	2.55E-03	2.36E-03	2.22E-03	2.04E-03	2.22E-03	2.41E-03	2.58E-03	2.96E-03	3.32E-03	3.06E-03	2.12E-03	1.60E-03	1.47E-03	1.27E-03
	Emission in each Box of 1st jet	g/s	1.53E-04	1.04E-04	7.29E-05	5.74E-05	4.88E-05	1.14E-04	2.58E-04	4.79E-04	8.38E-04	7.58E-04	6.37E-04	5.90E-04	5.56E-04	5.10E-04	5.55E-04	6.02E-04	6.44E-04	7.39E-04	8.31E-04	7.65E-04	5.30E-04	4.01E-04	3.67E-04	3.17E-04
	Emission in each Box of 2nd jet	g/s	8.76E-05	5.94E-05	4.17E-05	3.28E-05	2.79E-05	6.51E-05	1.48E-04	2.74E-04	4.79E-04	4.33E-04	3.64E-04	3.37E-04	3.18E-04	2.91E-04	3.17E-04	3.44E-04	3.68E-04	4.22E-04	4.75E-04	4.37E-04	3.03E-04	2.29E-04	2.10E-04	1.81E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0018***	***0.0017***	***0.0014***	***0.0013***	***0.0013***	***0.0012***	***0.0013***	***0.0015***	***0.0016***	***0.0018***	***0.0021***	***0.0019***	***0.0013***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.06E-04	1.59E-04	1.11E-04	8.52E-05	7.14E-05	1.12E-04	2.44E-04	5.63E-04	1.22E-03	1.10E-03	9.16E-04	8.39E-04	8.93E-04	8.08E-04	8.93E-04	9.74E-04	1.04E-03	1.20E-03	1.37E-03	1.25E-03	8.40E-04	6.08E-04	5.53E-04	4.78E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.03E-04	7.94E-05	5.53E-05	4.26E-05	3.57E-05	5.58E-05	1.22E-04	2.81E-04	6.08E-04	5.52E-04	4.58E-04	4.19E-04	4.47E-04	4.04E-04	4.47E-04	4.87E-04	5.20E-04	6.01E-04	6.84E-04	6.26E-04	4.20E-04	3.04E-04	2.76E-04	2.39E-04
	Emission in each Box of 1st jet	g/s	2.58E-05	1.99E-05	1.38E-05	1.07E-05	8.93E-06	1.39E-05	3.05E-05	7.03E-05	1.52E-04	1.38E-04	1.15E-04	1.05E-04	1.12E-04	1.01E-04	1.12E-04	1.22E-04	1.30E-04	1.50E-04	1.71E-04	1.57E-04	1.05E-04	7.60E-05	6.91E-05	5.98E-05
	Emission in each Box of 2nd jet	g/s	1.47E-05	1.13E-05	7.90E-06	6.09E-06	5.10E-06	7.97E-06	1.74E-05	4.02E-05	8.69E-05	7.88E-05	6.54E-05	5.99E-05	6.38E-05	5.77E-05	6.38E-05	6.96E-05	7.42E-05	8.59E-05	9.77E-05	8.95E-05	6.00E-05	4.34E-05	3.95E-05	3.41E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104B01-104B15
Enclosure Involved: 104P2
Road Located: 106
Vehicle EF Adopted: 104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1164	0.0977	0.0997	0.1038	0.1061	0.2007	0.2132	0.1628	0.1922	0.1811	0.1636	0.1605	0.1303	0.1256	0.1289	0.1348	0.1367	0.1462	0.1565	0.1484	0.1250	0.1157	0.1132	0.1107
	NO2	g/vehicle/km	0.0197	0.0188	0.0191	0.0195	0.0197	0.0248	0.0253	0.0241	0.0351	0.0331	0.0296	0.0286	0.0263	0.0250	0.0261	0.0273	0.0277	0.0299	0.0323	0.0306	0.0250	0.0221	0.0214	0.0210
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0013***	***0.0029***	***0.0054***	***0.0095***	***0.0086***	***0.0072***	***0.0068***	***0.0064***	***0.0057***	***0.0062***	***0.0069***	***0.0073***	***0.0084***	***0.0095***	***0.0086***	***0.0060***	***0.0045***	***0.0041***	***0.0036***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.15E-03	7.83E-04	5.50E-04	4.26E-04	3.63E-04	8.51E-04	1.94E-03	3.59E-03	6.31E-03	5.76E-03	4.79E-03	4.50E-03	4.24E-03	3.82E-03	4.16E-03	4.58E-03	4.84E-03	5.58E-03	6.32E-03	5.76E-03	3.97E-03	3.00E-03	2.75E-03	2.38E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.77E-04	3.92E-04	2.75E-04	2.13E-04	1.81E-04	4.26E-04	9.69E-04	1.80E-03	3.15E-03	2.88E-03	2.39E-03	2.25E-03	2.12E-03	1.91E-03	2.08E-03	2.29E-03	2.42E-03	2.79E-03	3.16E-03	2.88E-03	1.99E-03	1.50E-03	1.38E-03	1.19E-03
	Emission in each Box of 1st jet	g/s	1.44E-04	9.79E-05	6.88E-05	5.33E-05	4.53E-05	1.06E-04	2.42E-04	4.49E-04	7.88E-04	7.21E-04	5.99E-04	5.63E-04	5.30E-04	4.78E-04	5.20E-04	5.72E-04	6.05E-04	6.98E-04	7.90E-04	7.20E-04	4.96E-04	3.75E-04	3.44E-04	2.97E-04
	Emission in each Box of 2nd jet	g/s	8.24E-05	5.59E-05	3.93E-05	3.04E-05	2.59E-05	6.08E-05	1.38E-04	2.57E-04	4.51E-04	4.12E-04	3.42E-04	3.21E-04	3.03E-04	2.73E-04	2.97E-04	3.27E-04	3.46E-04	3.99E-04	4.51E-04	4.11E-04	2.84E-04	2.14E-04	1.97E-04	1.70E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0017***	***0.0016***	***0.0013***	***0.0012***	***0.0013***	***0.0011***	***0.0013***	***0.0014***	***0.0015***	***0.0017***	***0.0020***	***0.0018***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.96E-04	1.51E-04	1.05E-04	8.01E-05	6.71E-05	1.05E-04	2.30E-04	5.32E-04	1.15E-03	1.05E-03	8.66E-04	8.03E-04	8.55E-04	7.62E-04	8.42E-04	9.28E-04	9.80E-04	1.14E-03	1.31E-03	1.19E-03	7.93E-04	5.74E-04	5.21E-04	4.52E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.78E-05	7.54E-05	5.26E-05	4.01E-05	3.36E-05	5.25E-05	1.15E-04	2.66E-04	5.76E-04	5.26E-04	4.33E-04	4.01E-04	4.27E-04	3.81E-04	4.21E-04	4.64E-04	4.90E-04	5.71E-04	6.53E-04	5.95E-04	3.97E-04	2.87E-04	2.61E-04	2.26E-04
	Emission in each Box of 1st jet	g/s	2.44E-05	1.89E-05	1.32E-05	1.00E-05	8.39E-06	1.31E-05	2.87E-05	6.64E-05	1.44E-04	1.32E-04	1.08E-04	1.00E-04	1.07E-04	9.53E-05	1.05E-04	1.16E-04	1.23E-04	1.43E-04	1.63E-04	1.49E-04	9.91E-05	7.17E-05	6.51E-05	5.65E-05
	Emission in each Box of 2nd jet	g/s	1.40E-05	1.08E-05	7.52E-06	5.72E-06	4.80E-06	7.50E-06	1.64E-05	3.80E-05	8.23E-05	7.52E-05	6.19E-05	5.73E-05	6.11E-05	5.44E-05	6.01E-05	6.63E-05	7.00E-05	8.16E-05	9.33E-05	8.50E-05	5.67E-05	4.10E-05	3.72E-05	3.23E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1090	0.0914	0.0927	0.0991	0.1013	0.1929	0.2050	0.1549	0.1828	0.1724	0.1556	0.1524	0.1236	0.1212	0.1245	0.1278	0.1323	0.1389	0.1488	0.1403	0.1184	0.1114	0.1085	0.1057
	NO2	g/vehicle/km	0.0186	0.0178	0.0180	0.0188	0.0189	0.0239	0.0244	0.0230	0.0336	0.0316	0.0282	0.0272	0.0251	0.0243	0.0252	0.0260	0.0269	0.0285	0.0308	0.0291	0.0237	0.0214	0.0206	0.0202
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0028***	***0.0051***	***0.0090***	***0.0082***	***0.0068***	***0.0064***	***0.0060***	***0.0055***	***0.0060***	***0.0065***	***0.0070***	***0.0080***	***0.0090***	***0.0082***	***0.0056***	***0.0043***	***0.0040***	***0.0034***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.08E-03	7.32E-04	5.12E-04	4.07E-04	3.46E-04	8.18E-04	1.86E-03	3.42E-03	6.00E-03	5.49E-03	4.55E-03	4.27E-03	4.02E-03	3.69E-03	4.02E-03	4.34E-03	4.68E-03	5.30E-03	6.01E-03	5.45E-03	3.76E-03	2.89E-03	2.64E-03	2.27E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.40E-04	3.66E-04	2.56E-04	2.03E-04	1.73E-04	4.09E-04	9.32E-04	1.71E-03	3.00E-03	2.74E-03	2.28E-03	2.14E-03	2.01E-03	1.85E-03	2.01E-03	2.17E-03	2.34E-03	2.65E-03	3.00E-03	2.72E-03	1.88E-03	1.45E-03	1.32E-03	1.14E-03
	Emission in each Box of 1st jet	g/s	1.35E-04	9.15E-05	6.40E-05	5.09E-05	4.33E-05	1.02E-04	2.33E-04	4.27E-04	7.50E-04	6.86E-04	5.69E-04	5.34E-04	5.03E-04	4.61E-04	5.03E-04	5.42E-04	5.86E-04	6.63E-04	7.51E-04	6.81E-04	4.70E-04	3.61E-04	3.30E-04	2.84E-04
	Emission in each Box of 2nd jet	g/s	7.72E-05	5.23E-05	3.66E-05	2.91E-05	2.47E-05	5.85E-05	1.33E-04	2.44E-04	4.28E-04	3.92E-04	3.25E-04	3.05E-04	2.87E-04	2.64E-04	2.87E-04	3.10E-04	3.35E-04	3.79E-04	4.29E-04	3.89E-04	2.69E-04	2.06E-04	1.88E-04	1.62E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0017***	***0.0015***	***0.0012***	***0.0011***	***0.0012***	***0.0011***	***0.0012***	***0.0013***	***0.0014***	***0.0016***	***0.0019***	***0.0017***	***0.0011***	***0.0008***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.85E-04	1.43E-04	9.91E-05	7.71E-05	6.46E-05	1.01E-04	2.22E-04	5.07E-04	1.10E-03	1.01E-03	8.25E-04	7.64E-04	8.15E-04	7.39E-04	8.15E-04	8.84E-04	9.52E-04	1.09E-03	1.24E-03	1.13E-03	7.54E-04	5.55E-04	5.02E-04	4.34E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.24E-05	7.13E-05	4.96E-05	3.85E-05	3.23E-05	5.06E-05	1.11E-04	2.54E-04	5.51E-04	5.03E-04	4.13E-04	3.82E-04	4.08E-04	3.69E-04	4.07E-04	4.42E-04	4.76E-04	5.44E-04	6.22E-04	5.65E-04	3.77E-04	2.77E-04	2.51E-04	2.17E-04
	Emission in each Box of 1st jet	g/s	2.31E-05	1.78E-05	1.24E-05	9.63E-06	8.07E-06	1.27E-05	2.77E-05	6.34E-05	1.38E-04	1.26E-04	1.03E-04	9.55E-05	1.02E-04	9.23E-05	1.02E-04	1.10E-04	1.19E-04	1.36E-04	1.56E-04	1.41E-04	9.42E-05	6.94E-05	6.27E-05	5.42E-05
	Emission in each Box of 2nd jet	g/s	1.32E-05	1.02E-05	7.08E-06	5.51E-06	4.61E-06	7.23E-06	1.58E-05	3.62E-05	7.87E-05	7.19E-05	5.90E-05	5.46E-05	5.82E-05	5.28E-05	5.82E-05	6.31E-05	6.80E-05	7.77E-05	8.89E-05	8.07E-05	5.38E-05	3.96E-05	3.59E-05	3.10E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0977	0.0811	0.0827	0.0859	0.0879	0.1680	0.1763	0.1341	0.1606	0.1506	0.1384	0.1352	0.1105	0.1078	0.1115	0.1140	0.1175	0.1252	0.1307	0.1256	0.1056	0.0966	0.0948	0.0922
	NO2	g/vehicle/km	0.0168	0.0160	0.0162	0.0165	0.0167	0.0210	0.0212	0.0201	0.0297	0.0279	0.0252	0.0243	0.0225	0.0217	0.0227	0.0234	0.0241	0.0259	0.0273	0.0262	0.0214	0.0188	0.0182	0.0178
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0011***	***0.0024***	***0.0044***	***0.0079***	***0.0072***	***0.0061***	***0.0057***	***0.0054***	***0.0049***	***0.0054***	***0.0058***	***0.0062***	***0.0072***	***0.0079***	***0.0073***	***0.0050***	***0.0038***	***0.0035***	***0.0030***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.68E-04	6.50E-04	4.57E-04	3.53E-04	3.00E-04	7.12E-04	1.60E-03	2.96E-03	5.27E-03	4.79E-03	4.05E-03	3.79E-03	3.59E-03	3.28E-03	3.60E-03	3.87E-03	4.16E-03	4.78E-03	5.28E-03	4.87E-03	3.36E-03	2.51E-03	2.30E-03	1.98E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.84E-04	3.25E-04	2.28E-04	1.76E-04	1.50E-04	3.56E-04	8.01E-04	1.48E-03	2.64E-03	2.40E-03	2.02E-03	1.90E-03	1.80E-03	1.64E-03	1.80E-03	1.93E-03	2.08E-03	2.39E-03	2.64E-03	2.44E-03	1.68E-03	1.25E-03	1.15E-03	9.90E-04
	Emission in each Box of 1st jet	g/s	1.21E-04	8.13E-05	5.71E-05	4.41E-05	3.75E-05	8.90E-05	2.00E-04	3.70E-04	6.59E-04	5.99E-04	5.06E-04	4.74E-04	4.49E-04	4.10E-04	4.50E-04	4.83E-04	5.20E-04	5.98E-04	6.60E-04	6.09E-04	4.19E-04	3.13E-04	2.88E-04	2.47E-04
	Emission in each Box of 2nd jet	g/s	6.92E-05	4.64E-05	3.26E-05	2.52E-05	2.14E-05	5.09E-05	1.14E-04	2.11E-04	3.76E-04	3.42E-04	2.89E-04	2.71E-04	2.57E-04	2.34E-04	2.57E-04	2.76E-04	2.97E-04	3.41E-04	3.77E-04	3.48E-04	2.40E-04	1.79E-04	1.65E-04	1.41E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0013***	***0.0011***	***0.0010***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0015***	***0.0017***	***0.0015***	***0.0010***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.67E-04	1.28E-04	8.94E-05	6.79E-05	5.69E-05	8.90E-05	1.93E-04	4.43E-04	9.75E-04	8.87E-04	7.38E-04	6.82E-04	7.32E-04	6.61E-04	7.34E-04	7.93E-04	8.51E-04	9.87E-04	1.10E-03	1.02E-03	6.80E-04	4.86E-04	4.43E-04	3.82E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.35E-05	6.41E-05	4.47E-05	3.40E-05	2.85E-05	4.45E-05	9.63E-05	2.22E-04	4.88E-04	4.43E-04	3.69E-04	3.41E-04	3.66E-04	3.30E-04	3.67E-04	3.96E-04	4.26E-04	4.93E-04	5.52E-04	5.09E-04	3.40E-04	2.43E-04	2.22E-04	1.91E-04
	Emission in each Box of 1st jet	g/s	2.09E-05	1.60E-05	1.12E-05	8.49E-06	7.12E-06	1.11E-05	2.41E-05	5.54E-05	1.22E-04	1.11E-04	9.23E-05	8.52E-05	9.16E-05	8.26E-05	9.17E-05	9.91E-05	1.06E-04	1.23E-04	1.38E-04	1.27E-04	8.51E-05	6.08E-05	5.54E-05	4.78E-05
	Emission in each Box of 2nd jet	g/s	1.19E-05	9.16E-06	6.39E-06	4.85E-06	4.07E-06	6.36E-06	1.38E-05	3.17E-05	6.97E-05	6.33E-05	5.27E-05	4.87E-05	5.23E-05	4.72E-05	5.24E-05	5.66E-05	6.08E-05	7.05E-05	7.88E-05	7.27E-05	4.86E-05	3.47E-05	3.17E-05	2.73E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0941	0.0786	0.0822	0.0854	0.0869	0.1661	0.1722	0.1324	0.1569	0.1502	0.1338	0.1306	0.1060	0.1042	0.1062	0.1101	0.1155	0.1221	0.1283	0.1241	0.1044	0.0960	0.0936	0.0916
	NO2	g/vehicle/km	0.0163	0.0155	0.0161	0.0165	0.0165	0.0208	0.0207	0.0199	0.0291	0.0278	0.0245	0.0236	0.0217	0.0211	0.0218	0.0227	0.0237	0.0253	0.0269	0.0260	0.0212	0.0187	0.0180	0.0177
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0014***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0011***	***0.0023***	***0.0044***	***0.0077***	***0.0072***	***0.0059***	***0.0055***	***0.0052***	***0.0048***	***0.0051***	***0.0056***	***0.0061***	***0.0070***	***0.0078***	***0.0072***	***0.0050***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.33E-04	6.30E-04	4.54E-04	3.51E-04	2.97E-04	7.05E-04	1.56E-03	2.92E-03	5.15E-03	4.78E-03	3.91E-03	3.66E-03	3.45E-03	3.17E-03	3.43E-03	3.74E-03	4.09E-03	4.66E-03	5.18E-03	4.82E-03	3.31E-03	2.49E-03	2.28E-03	1.97E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.67E-04	3.15E-04	2.27E-04	1.75E-04	1.48E-04	3.52E-04	7.82E-04	1.46E-03	2.57E-03	2.39E-03	1.96E-03	1.83E-03	1.72E-03	1.59E-03	1.72E-03	1.87E-03	2.04E-03	2.33E-03	2.59E-03	2.41E-03	1.66E-03	1.24E-03	1.14E-03	9.83E-04
	Emission in each Box of 1st jet	g/s	1.17E-04	7.87E-05	5.68E-05	4.38E-05	3.71E-05	8.81E-05	1.96E-04	3.65E-04	6.44E-04	5.97E-04	4.89E-04	4.58E-04	4.31E-04	3.96E-04	4.29E-04	4.67E-04	5.11E-04	5.83E-04	6.47E-04	6.02E-04	4.14E-04	3.11E-04	2.85E-04	2.46E-04
	Emission in each Box of 2nd jet	g/s	6.67E-05	4.50E-05	3.24E-05	2.51E-05	2.12E-05	5.03E-05	1.12E-04	2.09E-04	3.68E-04	3.41E-04	2.80E-04	2.62E-04	2.46E-04	2.27E-04	2.45E-04	2.67E-04	2.92E-04	3.33E-04	3.70E-04	3.44E-04	2.37E-04	1.78E-04	1.63E-04	1.40E-04
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0014***	***0.0013***	***0.0011***	***0.0010***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0014***	***0.0016***	***0.0015***	***0.0010***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.62E-04	1.25E-04	8.89E-05	6.76E-05	5.63E-05	8.81E-05	1.88E-04	4.38E-04	9.56E-04	8.86E-04	7.17E-04	6.62E-04	7.07E-04	6.42E-04	7.03E-04	7.70E-04	8.39E-04	9.65E-04	1.09E-03	1.01E-03	6.73E-04	4.84E-04	4.39E-04	3.80E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.08E-05	6.23E-05	4.45E-05	3.38E-05	2.82E-05	4.41E-05	9.42E-05	2.19E-04	4.78E-04	4.43E-04	3.59E-04	3.31E-04	3.53E-04	3.21E-04	3.52E-04	3.85E-04	4.20E-04	4.83E-04	5.43E-04	5.04E-04	3.37E-04	2.42E-04	2.19E-04	1.90E-04
	Emission in each Box of 1st jet	g/s	2.02E-05	1.56E-05	1.11E-05	8.45E-06	7.04E-06	1.10E-05	2.36E-05	5.48E-05	1.20E-04	1.11E-04	8.97E-05	8.28E-05	8.83E-05	8.02E-05	8.79E-05	9.62E-05	1.05E-04	1.21E-04	1.36E-04	1.26E-04	8.42E-05	6.05E-05	5.48E-05	4.76E-05
	Emission in each Box of 2nd jet	g/s	1.15E-05	8.90E-06	6.35E-06	4.83E-06	4.02E-06	6.30E-06	1.35E-05	3.13E-05	6.83E-05	6.33E-05	5.12E-05	4.73E-05	5.05E-05	4.58E-05	5.02E-05	5.50E-05	5.99E-05	6.89E-05	7.75E-05	7.20E-05	4.81E-05	3.46E-05	3.13E-05	2.72E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104B01-104B15
Enclosure Involved: 104P2
Road Located: 106
Vehicle EF Adopted: 104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0948	0.0781	0.0796	0.0826	0.0845	0.1608	0.1722	0.1290	0.1531	0.1452	0.1344	0.1323	0.1040	0.1023	0.1075	0.1107	0.1134	0.1218	0.1268	0.1227	0.1025	0.0948	0.0924	0.0892
	NO2	g/vehicle/km	0.0164	0.0155	0.0157	0.0160	0.0161	0.0202	0.0207	0.0194	0.0284	0.0269	0.0246	0.0239	0.0214	0.0207	0.0220	0.0228	0.0233	0.0252	0.0266	0.0257	0.0208	0.0184	0.0178	0.0173
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0014***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0010***	***0.0023***	***0.0043***	***0.0075***	***0.0069***	***0.0059***	***0.0056***	***0.0051***	***0.0047***	***0.0052***	***0.0056***	***0.0060***	***0.0070***	***0.0077***	***0.0071***	***0.0049***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.39E-04	6.26E-04	4.39E-04	3.39E-04	2.89E-04	6.82E-04	1.56E-03	2.85E-03	5.03E-03	4.62E-03	3.93E-03	3.71E-03	3.38E-03	3.12E-03	3.47E-03	3.76E-03	4.01E-03	4.65E-03	5.12E-03	4.76E-03	3.26E-03	2.46E-03	2.25E-03	1.91E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.70E-04	3.13E-04	2.20E-04	1.70E-04	1.44E-04	3.41E-04	7.82E-04	1.42E-03	2.51E-03	2.31E-03	1.97E-03	1.85E-03	1.69E-03	1.56E-03	1.74E-03	1.88E-03	2.01E-03	2.32E-03	2.56E-03	2.38E-03	1.63E-03	1.23E-03	1.12E-03	9.57E-04
	Emission in each Box of 1st jet	g/s	1.17E-04	7.83E-05	5.49E-05	4.24E-05	3.61E-05	8.53E-05	1.96E-04	3.56E-04	6.28E-04	5.78E-04	4.92E-04	4.64E-04	4.23E-04	3.89E-04	4.34E-04	4.69E-04	5.02E-04	5.81E-04	6.40E-04	5.95E-04	4.07E-04	3.07E-04	2.81E-04	2.39E-04
	Emission in each Box of 2nd jet	g/s	6.71E-05	4.47E-05	3.14E-05	2.42E-05	2.06E-05	4.87E-05	1.12E-04	2.03E-04	3.59E-04	3.30E-04	2.81E-04	2.65E-04	2.42E-04	2.23E-04	2.48E-04	2.68E-04	2.87E-04	3.32E-04	3.66E-04	3.40E-04	2.33E-04	1.76E-04	1.61E-04	1.37E-04
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0014***	***0.0013***	***0.0011***	***0.0010***	***0.0010***	***0.0009***	***0.0011***	***0.0012***	***0.0012***	***0.0014***	***0.0016***	***0.0015***	***0.0010***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.62E-04	1.24E-04	8.65E-05	6.56E-05	5.50E-05	8.56E-05	1.88E-04	4.28E-04	9.32E-04	8.56E-04	7.20E-04	6.69E-04	6.95E-04	6.31E-04	7.11E-04	7.73E-04	8.25E-04	9.61E-04	1.07E-03	9.97E-04	6.60E-04	4.79E-04	4.33E-04	3.72E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.12E-05	6.20E-05	4.32E-05	3.28E-05	2.75E-05	4.28E-05	9.42E-05	2.14E-04	4.66E-04	4.28E-04	3.60E-04	3.34E-04	3.47E-04	3.15E-04	3.55E-04	3.86E-04	4.12E-04	4.81E-04	5.37E-04	4.98E-04	3.30E-04	2.39E-04	2.17E-04	1.86E-04
	Emission in each Box of 1st jet	g/s	2.03E-05	1.55E-05	1.08E-05	8.20E-06	6.88E-06	1.07E-05	2.36E-05	5.35E-05	1.17E-04	1.07E-04	8.99E-05	8.36E-05	8.68E-05	7.89E-05	8.88E-05	9.66E-05	1.03E-04	1.20E-04	1.34E-04	1.25E-04	8.25E-05	5.98E-05	5.42E-05	4.65E-05
	Emission in each Box of 2nd jet	g/s	1.16E-05	8.85E-06	6.18E-06	4.69E-06	3.93E-06	6.12E-06	1.35E-05	3.06E-05	6.66E-05	6.12E-05	5.14E-05	4.78E-05	4.96E-05	4.51E-05	5.08E-05	5.52E-05	5.89E-05	6.87E-05	7.67E-05	7.12E-05	4.71E-05	3.42E-05	3.10E-05	2.65E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0960	0.0797	0.0813	0.0844	0.0863	0.1642	0.1757	0.1324	0.1550	0.1457	0.1365	0.1324	0.1060	0.1042	0.1069	0.1101	0.1162	0.1213	0.1306	0.1226	0.1026	0.0948	0.0925	0.0904
	NO2	g/vehicle/km	0.0166	0.0158	0.0160	0.0163	0.0164	0.0206	0.0211	0.0199	0.0287	0.0270	0.0250	0.0239	0.0217	0.0211	0.0219	0.0227	0.0239	0.0251	0.0273	0.0257	0.0208	0.0185	0.0178	0.0175
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0010***	***0.0024***	***0.0044***	***0.0076***	***0.0070***	***0.0060***	***0.0056***	***0.0052***	***0.0048***	***0.0052***	***0.0056***	***0.0062***	***0.0069***	***0.0079***	***0.0071***	***0.0049***	***0.0037***	***0.0034***	***0.0029***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.52E-04	6.39E-04	4.49E-04	3.47E-04	2.95E-04	6.97E-04	1.60E-03	2.92E-03	5.09E-03	4.64E-03	4.00E-03	3.71E-03	3.45E-03	3.17E-03	3.45E-03	3.74E-03	4.11E-03	4.63E-03	5.27E-03	4.76E-03	3.26E-03	2.46E-03	2.25E-03	1.94E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.76E-04	3.19E-04	2.24E-04	1.73E-04	1.47E-04	3.48E-04	7.98E-04	1.46E-03	2.54E-03	2.32E-03	2.00E-03	1.86E-03	1.72E-03	1.59E-03	1.73E-03	1.87E-03	2.06E-03	2.32E-03	2.64E-03	2.38E-03	1.63E-03	1.23E-03	1.12E-03	9.71E-04
	Emission in each Box of 1st jet	g/s	1.19E-04	7.98E-05	5.61E-05	4.33E-05	3.69E-05	8.71E-05	2.00E-04	3.65E-04	6.36E-04	5.80E-04	5.00E-04	4.64E-04	4.31E-04	3.96E-04	4.32E-04	4.67E-04	5.14E-04	5.79E-04	6.59E-04	5.95E-04	4.07E-04	3.07E-04	2.81E-04	2.43E-04
	Emission in each Box of 2nd jet	g/s	6.80E-05	4.56E-05	3.21E-05	2.48E-05	2.11E-05	4.98E-05	1.14E-04	2.09E-04	3.63E-04	3.31E-04	2.85E-04	2.65E-04	2.46E-04	2.27E-04	2.47E-04	2.67E-04	2.94E-04	3.31E-04	3.77E-04	3.40E-04	2.33E-04	1.76E-04	1.61E-04	1.39E-04
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0014***	***0.0013***	***0.0011***	***0.0010***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0014***	***0.0017***	***0.0015***	***0.0010***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.64E-04	1.26E-04	8.81E-05	6.69E-05	5.61E-05	8.72E-05	1.92E-04	4.38E-04	9.43E-04	8.59E-04	7.30E-04	6.70E-04	7.07E-04	6.42E-04	7.08E-04	7.70E-04	8.44E-04	9.60E-04	1.10E-03	9.97E-04	6.61E-04	4.79E-04	4.34E-04	3.76E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.22E-05	6.31E-05	4.40E-05	3.35E-05	2.80E-05	4.36E-05	9.60E-05	2.19E-04	4.72E-04	4.30E-04	3.65E-04	3.35E-04	3.53E-04	3.21E-04	3.54E-04	3.85E-04	4.22E-04	4.80E-04	5.51E-04	4.99E-04	3.30E-04	2.39E-04	2.17E-04	1.88E-04
	Emission in each Box of 1st jet	g/s	2.06E-05	1.58E-05	1.10E-05	8.37E-06	7.01E-06	1.09E-05	2.40E-05	5.48E-05	1.18E-04	1.07E-04	9.13E-05	8.38E-05	8.83E-05	8.02E-05	8.85E-05	9.62E-05	1.06E-04	1.20E-04	1.38E-04	1.25E-04	8.26E-05	5.99E-05	5.42E-05	4.70E-05
	Emission in each Box of 2nd jet	g/s	1.17E-05	9.01E-06	6.29E-06	4.78E-06	4.00E-06	6.23E-06	1.37E-05	3.13E-05	6.74E-05	6.14E-05	5.22E-05	4.79E-05	5.05E-05	4.58E-05	5.06E-05	5.50E-05	6.03E-05	6.85E-05	7.88E-05	7.12E-05	4.72E-05	3.42E-05	3.10E-05	2.69E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section 104B01-104B15
Enclosure Involvec 104P2
Road Located 106
Vehicle EF Adopte 104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0953	0.0791	0.0806	0.0832	0.0879	0.1670	0.1776	0.1307	0.1563	0.1474	0.1384	0.1324	0.1074	0.1070	0.1091	0.1131	0.1151	0.1209	0.1299	0.1211	0.1056	0.0972	0.0948	0.0927
	NO2	g/vehicle/km	0.0165	0.0156	0.0158	0.0161	0.0167	0.0209	0.0213	0.0196	0.0290	0.0273	0.0252	0.0238	0.0220	0.0216	0.0223	0.0232	0.0236	0.0250	0.0272	0.0254	0.0214	0.0189	0.0182	0.0179
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0014***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0011***	***0.0024***	***0.0043***	***0.0077***	***0.0070***	***0.0061***	***0.0056***	***0.0052***	***0.0049***	***0.0053***	***0.0058***	***0.0061***	***0.0069***	***0.0079***	***0.0071***	***0.0050***	***0.0038***	***0.0035***	***0.0030***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.45E-04	6.34E-04	4.45E-04	3.42E-04	3.00E-04	7.08E-04	1.61E-03	2.88E-03	5.13E-03	4.69E-03	4.05E-03	3.71E-03	3.49E-03	3.26E-03	3.52E-03	3.84E-03	4.07E-03	4.62E-03	5.25E-03	4.70E-03	3.36E-03	2.52E-03	2.30E-03	1.99E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.73E-04	3.17E-04	2.23E-04	1.71E-04	1.50E-04	3.54E-04	8.07E-04	1.44E-03	2.56E-03	2.35E-03	2.02E-03	1.86E-03	1.75E-03	1.63E-03	1.76E-03	1.92E-03	2.04E-03	2.31E-03	2.62E-03	2.35E-03	1.68E-03	1.26E-03	1.15E-03	9.95E-04
	Emission in each Box of 1st jet	g/s	1.18E-04	7.92E-05	5.56E-05	4.27E-05	3.75E-05	8.85E-05	2.02E-04	3.60E-04	6.41E-04	5.86E-04	5.06E-04	4.64E-04	4.37E-04	4.07E-04	4.41E-04	4.80E-04	5.09E-04	5.77E-04	6.56E-04	5.88E-04	4.19E-04	3.15E-04	2.88E-04	2.49E-04
	Emission in each Box of 2nd jet	g/s	6.75E-05	4.53E-05	3.18E-05	2.44E-05	2.14E-05	5.06E-05	1.15E-04	2.06E-04	3.66E-04	3.35E-04	2.89E-04	2.65E-04	2.49E-04	2.33E-04	2.52E-04	2.74E-04	2.91E-04	3.30E-04	3.75E-04	3.36E-04	2.40E-04	1.80E-04	1.65E-04	1.42E-04
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0014***	***0.0013***	***0.0011***	***0.0010***	***0.0011***	***0.0010***	***0.0011***	***0.0012***	***0.0013***	***0.0014***	***0.0016***	***0.0015***	***0.0010***	***0.0007***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.63E-04	1.25E-04	8.74E-05	6.60E-05	5.69E-05	8.86E-05	1.94E-04	4.33E-04	9.52E-04	8.69E-04	7.38E-04	6.69E-04	7.14E-04	6.57E-04	7.20E-04	7.88E-04	8.35E-04	9.56E-04	1.10E-03	9.85E-04	6.80E-04	4.89E-04	4.43E-04	3.85E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.16E-05	6.26E-05	4.37E-05	3.30E-05	2.85E-05	4.43E-05	9.70E-05	2.17E-04	4.76E-04	4.35E-04	3.69E-04	3.34E-04	3.57E-04	3.28E-04	3.60E-04	3.94E-04	4.18E-04	4.78E-04	5.49E-04	4.93E-04	3.40E-04	2.45E-04	2.22E-04	1.92E-04
	Emission in each Box of 1st jet	g/s	2.04E-05	1.57E-05	1.09E-05	8.25E-06	7.12E-06	1.11E-05	2.42E-05	5.41E-05	1.19E-04	1.09E-04	9.23E-05	8.36E-05	8.92E-05	8.21E-05	9.00E-05	9.85E-05	1.04E-04	1.19E-04	1.37E-04	1.23E-04	8.51E-05	6.12E-05	5.54E-05	4.81E-05
	Emission in each Box of 2nd jet	g/s	1.17E-05	8.95E-06	6.24E-06	4.72E-06	4.07E-06	6.33E-06	1.39E-05	3.09E-05	6.80E-05	6.21E-05	5.27E-05	4.78E-05	5.10E-05	4.69E-05	5.14E-05	5.63E-05	5.97E-05	6.83E-05	7.84E-05	7.04E-05	4.86E-05	3.50E-05	3.17E-05	2.75E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1080	0.0904	0.0918	0.0955	0.0973	0.1849	0.1974	0.1505	0.1776	0.1674	0.1509	0.1479	0.1207	0.1177	0.1209	0.1247	0.1285	0.1348	0.1459	0.1380	0.1169	0.1082	0.1057	0.1029
	NO2	g/vehicle/km	0.0185	0.0176	0.0178	0.0182	0.0182	0.0230	0.0236	0.0224	0.0327	0.0307	0.0274	0.0265	0.0244	0.0236	0.0245	0.0255	0.0262	0.0277	0.0303	0.0287	0.0235	0.0208	0.0202	0.0197
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0027***	***0.0050***	***0.0087***	***0.0080***	***0.0066***	***0.0062***	***0.0059***	***0.0054***	***0.0059***	***0.0063***	***0.0068***	***0.0077***	***0.0088***	***0.0080***	***0.0056***	***0.0042***	***0.0039***	***0.0033***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.07E-03	7.25E-04	5.07E-04	3.92E-04	3.32E-04	7.84E-04	1.79E-03	3.32E-03	5.83E-03	5.33E-03	4.42E-03	4.15E-03	3.93E-03	3.59E-03	3.91E-03	4.23E-03	4.55E-03	5.15E-03	5.89E-03	5.36E-03	3.71E-03	2.81E-03	2.57E-03	2.21E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.35E-04	3.62E-04	2.53E-04	1.96E-04	1.66E-04	3.92E-04	8.97E-04	1.66E-03	2.91E-03	2.66E-03	2.21E-03	2.07E-03	1.96E-03	1.79E-03	1.95E-03	2.12E-03	2.27E-03	2.57E-03	2.94E-03	2.68E-03	1.86E-03	1.40E-03	1.28E-03	1.10E-03
	Emission in each Box of 1st jet	g/s	1.34E-04	9.06E-05	6.33E-05	4.90E-05	4.15E-05	9.80E-05	2.24E-04	4.15E-04	7.29E-04	6.66E-04	5.52E-04	5.19E-04	4.91E-04	4.48E-04	4.88E-04	5.29E-04	5.69E-04	6.43E-04	7.36E-04	6.70E-04	4.64E-04	3.51E-04	3.21E-04	2.76E-04
	Emission in each Box of 2nd jet	g/s	7.64E-05	5.18E-05	3.62E-05	2.80E-05	2.37E-05	5.60E-05	1.28E-04	2.37E-04	4.16E-04	3.81E-04	3.15E-04	2.96E-04	2.80E-04	2.56E-04	2.79E-04	3.02E-04	3.25E-04	3.68E-04	4.21E-04	3.83E-04	2.65E-04	2.00E-04	1.84E-04	1.58E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0015***	***0.0012***	***0.0011***	***0.0012***	***0.0011***	***0.0012***	***0.0013***	***0.0014***	***0.0016***	***0.0018***	***0.0017***	***0.0011***	***0.0008***	***0.0007***	***0.0006***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.83E-04	1.41E-04	9.82E-05	7.47E-05	6.22E-05	9.75E-05	2.14E-04	4.94E-04	1.07E-03	9.78E-04	8.02E-04	7.43E-04	7.95E-04	7.18E-04	7.91E-04	8.64E-04	9.27E-04	1.06E-03	1.22E-03	1.11E-03	7.45E-04	5.40E-04	4.91E-04	4.24E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.16E-05	7.07E-05	4.91E-05	3.74E-05	3.11E-05	4.88E-05	1.07E-04	2.47E-04	5.37E-04	4.89E-04	4.01E-04	3.72E-04	3.97E-04	3.59E-04	3.96E-04	4.32E-04	4.64E-04	5.29E-04	6.11E-04	5.56E-04	3.73E-04	2.70E-04	2.45E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	2.29E-05	1.77E-05	1.23E-05	9.34E-06	7.77E-06	1.22E-05	2.68E-05	6.18E-05	1.34E-04	1.22E-04	1.00E-04	9.29E-05	9.94E-05	8.97E-05	9.89E-05	1.08E-04	1.16E-04	1.32E-04	1.53E-04	1.39E-04	9.32E-05	6.75E-05	6.13E-05	5.29E-05
	Emission in each Box of 2nd jet	g/s	1.31E-05	1.01E-05	7.02E-06	5.34E-06	4.44E-06	6.97E-06	1.53E-05	3.53E-05	7.67E-05	6.99E-05	5.73E-05	5.31E-05	5.68E-05	5.13E-05	5.65E-05	6.17E-05	6.62E-05	7.56E-05	8.73E-05	7.94E-05	5.32E-05	3.86E-05	3.50E-05	3.03E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104B01-104B15
Enclosure Involvec	104P2
Road Located	106
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1189	0.1011	0.1028	0.1080	0.1104	0.2091	0.2227	0.1696	0.2006	0.1897	0.1710	0.1666	0.1341	0.1308	0.1343	0.1387	0.1421	0.1518	0.1608	0.1546	0.1303	0.1206	0.1179	0.1154
	NO2	g/vehicle/km	0.0201	0.0194	0.0196	0.0202	0.0203	0.0257	0.0263	0.0250	0.0366	0.0346	0.0308	0.0296	0.0270	0.0260	0.0270	0.0280	0.0288	0.0309	0.0332	0.0318	0.0259	0.0230	0.0223	0.0219
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0018***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0030***	***0.0056***	***0.0099***	***0.0091***	***0.0075***	***0.0070***	***0.0065***	***0.0060***	***0.0065***	***0.0071***	***0.0075***	***0.0087***	***0.0097***	***0.0090***	***0.0062***	***0.0047***	***0.0043***	***0.0037***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.18E-03	8.10E-04	5.67E-04	4.43E-04	3.77E-04	8.87E-04	2.02E-03	3.74E-03	6.59E-03	6.04E-03	5.01E-03	4.67E-03	4.36E-03	3.98E-03	4.34E-03	4.71E-03	5.03E-03	5.79E-03	6.49E-03	6.00E-03	4.14E-03	3.13E-03	2.87E-03	2.48E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.89E-04	4.05E-04	2.84E-04	2.22E-04	1.89E-04	4.43E-04	1.01E-03	1.87E-03	3.29E-03	3.02E-03	2.50E-03	2.34E-03	2.18E-03	1.99E-03	2.17E-03	2.35E-03	2.52E-03	2.90E-03	3.25E-03	3.00E-03	2.07E-03	1.56E-03	1.43E-03	1.24E-03
	Emission in each Box of 1st jet	g/s	1.47E-04	1.01E-04	7.09E-05	5.54E-05	4.71E-05	1.11E-04	2.53E-04	4.68E-04	8.23E-04	7.55E-04	6.26E-04	5.84E-04	5.45E-04	4.98E-04	5.42E-04	5.88E-04	6.29E-04	7.24E-04	8.12E-04	7.50E-04	5.17E-04	3.91E-04	3.58E-04	3.10E-04
	Emission in each Box of 2nd jet	g/s	8.42E-05	5.78E-05	4.05E-05	3.17E-05	2.69E-05	6.33E-05	1.45E-04	2.67E-04	4.70E-04	4.31E-04	3.58E-04	3.34E-04	3.11E-04	2.85E-04	3.10E-04	3.36E-04	3.59E-04	4.14E-04	4.64E-04	4.29E-04	2.96E-04	2.23E-04	2.05E-04	1.77E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0008***	***0.0018***	***0.0017***	***0.0014***	***0.0012***	***0.0013***	***0.0012***	***0.0013***	***0.0014***	***0.0015***	***0.0018***	***0.0020***	***0.0019***	***0.0012***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.99E-04	1.55E-04	1.08E-04	8.30E-05	6.95E-05	1.09E-04	2.39E-04	5.52E-04	1.20E-03	1.10E-03	9.02E-04	8.30E-04	8.77E-04	7.91E-04	8.72E-04	9.51E-04	1.02E-03	1.18E-03	1.34E-03	1.23E-03	8.23E-04	5.97E-04	5.42E-04	4.70E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.97E-05	7.76E-05	5.40E-05	4.15E-05	3.48E-05	5.45E-05	1.20E-04	2.76E-04	6.00E-04	5.50E-04	4.51E-04	4.15E-04	4.38E-04	3.95E-04	4.36E-04	4.76E-04	5.09E-04	5.90E-04	6.69E-04	6.17E-04	4.11E-04	2.98E-04	2.71E-04	2.35E-04
	Emission in each Box of 1st jet	g/s	2.49E-05	1.94E-05	1.35E-05	1.04E-05	8.69E-06	1.36E-05	2.99E-05	6.89E-05	1.50E-04	1.38E-04	1.13E-04	1.04E-04	1.10E-04	9.89E-05	1.09E-04	1.19E-04	1.27E-04	1.48E-04	1.67E-04	1.54E-04	1.03E-04	7.46E-05	6.78E-05	5.88E-05
	Emission in each Box of 2nd jet	g/s	1.42E-05	1.11E-05	7.72E-06	5.93E-06	4.97E-06	7.78E-06	1.71E-05	3.94E-05	8.58E-05	7.86E-05	6.44E-05	5.93E-05	6.26E-05	5.65E-05	6.23E-05	6.80E-05	7.27E-05	8.43E-05	9.56E-05	8.82E-05	5.88E-05	4.26E-05	3.87E-05	3.36E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104B01-104B15
Enclosure Involvec: 104P2
Road Located: 106
Vehicle EF Adopte: 104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	589	476	328	244	203	252	540	1311	1950	1891	1739	1666	1932	1809	1919	2016	2103	2268	2399	2306	1887	1541	1445	1276
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1258	0.1062	0.1080	0.1128	0.1168	0.2194	0.2329	0.1774	0.2097	0.1980	0.1778	0.1736	0.1393	0.1360	0.1400	0.1442	0.1478	0.1574	0.1687	0.1600	0.1354	0.1251	0.1241	0.1214
	NO2	g/vehicle/km	0.0211	0.0202	0.0204	0.0210	0.0213	0.0268	0.0274	0.0260	0.0380	0.0358	0.0319	0.0307	0.0280	0.0270	0.0281	0.0291	0.0298	0.0319	0.0346	0.0328	0.0268	0.0237	0.0232	0.0228
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Number of 2nd 50m Box	#	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NO Emission Rate		g/s	***0.0019***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0014***	***0.0032***	***0.0059***	***0.0103***	***0.0095***	***0.0078***	***0.0073***	***0.0068***	***0.0062***	***0.0068***	***0.0073***	***0.0078***	***0.0090***	***0.0102***	***0.0093***	***0.0065***	***0.0049***	***0.0045***	***0.0039***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.25E-03	8.51E-04	5.96E-04	4.63E-04	3.99E-04	9.31E-04	2.12E-03	3.91E-03	6.88E-03	6.30E-03	5.20E-03	4.87E-03	4.53E-03	4.14E-03	4.52E-03	4.89E-03	5.23E-03	6.01E-03	6.81E-03	6.21E-03	4.30E-03	3.25E-03	3.02E-03	2.61E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.24E-04	4.25E-04	2.98E-04	2.32E-04	2.00E-04	4.65E-04	1.06E-03	1.96E-03	3.44E-03	3.15E-03	2.60E-03	2.43E-03	2.26E-03	2.07E-03	2.26E-03	2.45E-03	2.62E-03	3.00E-03	3.41E-03	3.11E-03	2.15E-03	1.62E-03	1.51E-03	1.30E-03
	Emission in each Box of 1st jet	g/s	1.56E-04	1.06E-04	7.45E-05	5.79E-05	4.99E-05	1.16E-04	2.65E-04	4.89E-04	8.60E-04	7.88E-04	6.51E-04	6.08E-04	5.66E-04	5.17E-04	5.65E-04	6.12E-04	6.54E-04	7.51E-04	8.51E-04	7.76E-04	5.38E-04	4.06E-04	3.77E-04	3.26E-04
	Emission in each Box of 2nd jet	g/s	8.91E-05	6.08E-05	4.26E-05	3.31E-05	2.85E-05	6.65E-05	1.51E-04	2.80E-04	4.92E-04	4.50E-04	3.72E-04	3.48E-04	3.24E-04	2.96E-04	3.23E-04	3.50E-04	3.74E-04	4.29E-04	4.86E-04	4.44E-04	3.07E-04	2.32E-04	2.16E-04	1.86E-04
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0019***	***0.0017***	***0.0014***	***0.0013***	***0.0014***	***0.0012***	***0.0014***	***0.0015***	***0.0016***	***0.0018***	***0.0021***	***0.0019***	***0.0013***	***0.0009***	***0.0008***	***0.0007***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.09E-04	1.62E-04	1.13E-04	8.61E-05	7.28E-05	1.14E-04	2.49E-04	5.73E-04	1.25E-03	1.14E-03	9.33E-04	8.60E-04	9.10E-04	8.21E-04	9.07E-04	9.88E-04	1.05E-03	1.22E-03	1.40E-03	1.27E-03	8.52E-04	6.15E-04	5.65E-04	4.90E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.05E-04	8.10E-05	5.64E-05	4.30E-05	3.64E-05	5.69E-05	1.25E-04	2.87E-04	6.23E-04	5.70E-04	4.66E-04	4.30E-04	4.55E-04	4.10E-04	4.54E-04	4.94E-04	5.27E-04	6.09E-04	6.98E-04	6.36E-04	4.26E-04	3.07E-04	2.82E-04	2.45E-04
	Emission in each Box of 1st jet	g/s	2.62E-05	2.02E-05	1.41E-05	1.08E-05	9.10E-06	1.42E-05	3.11E-05	7.17E-05	1.56E-04	1.42E-04	1.17E-04	1.08E-04	1.14E-04	1.03E-04	1.13E-04	1.23E-04	1.32E-04	1.52E-04	1.74E-04	1.59E-04	1.06E-04	7.69E-05	7.06E-05	6.12E-05
	Emission in each Box of 2nd jet	g/s	1.50E-05	1.16E-05	8.06E-06	6.15E-06	5.20E-06	8.13E-06	1.78E-05	4.10E-05	8.91E-05	8.14E-05	6.66E-05	6.15E-05	6.50E-05	5.86E-05	6.48E-05	7.06E-05	7.52E-05	8.70E-05	9.97E-05	9.09E-05	6.08E-05	4.39E-05	4.03E-05	3.50E-05
RSP Emission Rate		g/s	***1.27E-04***	***8.56E-05***	***6.05E-05***	***4.70E-05***	***4.02E-05***	***9.58E-05***	***2.18E-04***	***3.86E-04***	***5.84E-04***	***5.42E-04***	***4.73E-04***	***4.46E-04***	***4.26E-04***	***3.99E-04***	***4.24E-04***	***4.54E-04***	***4.74E-04***	***5.33E-04***	***5.86E-04***	***5.42E-04***	***4.05E-04***	***3.25E-04***	***3.04E-04***	***2.62E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	8.48E-05	5.71E-05	4.03E-05	3.14E-05	2.68E-05	6.39E-05	1.46E-04	2.57E-04	3.89E-04	3.62E-04	3.15E-04	2.97E-04	2.84E-04	2.66E-04	2.83E-04	3.03E-04	3.16E-04	3.56E-04	3.91E-04	3.61E-04	2.70E-04	2.17E-04	2.03E-04	1.75E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	4.24E-05	2.85E-05	2.02E-05	1.57E-05	1.34E-05	3.19E-05	7.28E-05	1.29E-04	1.95E-04	1.81E-04	1.58E-04	1.49E-04	1.42E-04	1.33E-04	1.41E-04	1.51E-04	1.58E-04	1.78E-04	1.95E-04	1.81E-04	1.35E-04	1.08E-04	1.01E-04	8.73E-05
	Emission in each Box of 1st jet	g/s	1.06E-05	7.13E-06	5.04E-06	3.92E-06	3.35E-06	7.98E-06	1.82E-05	3.22E-05	4.87E-05	4.52E-05	3.94E-05	3.72E-05	3.55E-05	3.33E-05	3.54E-05	3.78E-05	3.95E-05	4.44E-05	4.89E-05	4.51E-05	3.38E-05	2.71E-05	2.53E-05	2.18E-05
	Emission in each Box of 2nd jet	g/s	6.05E-06	4.08E-06	2.88E-06	2.24E-06	1.91E-06	4.56E-06	1.04E-05	1.84E-05	2.78E-05	2.58E-05	2.25E-05	2.12E-05	2.03E-05	1.90E-05	2.02E-05	2.16E-05	2.26E-05	2.54E-05	2.79E-05	2.58E-05	1.93E-05	1.55E-05	1.45E-05	1.25E-05
FSP Emission Rate		g/s	***1.17E-04***	***7.88E-05***	***5.57E-05***	***4.33E-05***	***3.67E-05***	***8.82E-05***	***2.01E-04***	***3.54E-04***	***5.38E-04***	***4.99E-04***	***4.36E-04***	***4.12E-04***	***3.93E-04***	***3.65E-04***	***3.92E-04***	***4.19E-04***	***4.38E-04***	***4.90E-04***	***5.40E-04***	***5.00E-04***	***3.74E-04***	***3.00E-04***	***2.78E-04***	***2.41E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.81E-05	5.25E-05	3.71E-05	2.89E-05	2.45E-05	5.88E-05	1.34E-04	2.36E-04	3.59E-04	3.33E-04	2.91E-04	2.75E-04	2.62E-04	2.44E-04	2.61E-04	2.79E-04	2.92E-04	3.26E-04	3.60E-04	3.34E-04	2.49E-04	2.00E-04	1.85E-04	1.61E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.90E-05	2.63E-05	1.86E-05	1.44E-05	1.22E-05	2.94E-05	6.70E-05	1.18E-04	1.79E-04	1.66E-04	1.45E-04	1.37E-04	1.31E-04	1.22E-04	1.31E-04	1.40E-04	1.46E-04	1.63E-04	1.80E-04	1.67E-04	1.25E-04	1.00E-04	9.26E-05	8.05E-05
	Emission in each Box of 1st jet	g/s	9.76E-06	6.57E-06	4.64E-06	3.61E-06	3.06E-06	7.35E-06	1.67E-05	2.95E-05	4.48E-05	4.16E-05	3.64E-05	3.44E-05	3.28E-05	3.04E-05	3.26E-05	3.49E-05	3.65E-05	4.08E-05	4.50E-05	4.17E-05	3.11E-05	2.50E-05	2.31E-05	2.01E-05
	Emission in each Box of 2nd jet	g/s	5.58E-06	3.75E-06	2.65E-06	2.06E-06	1.75E-06	4.20E-06	9.57E-06	1.69E-05	2.56E-05	2.38E-05	2.08E-05	1.96E-05	1.87E-05	1.74E-05	1.86E-05	2.00E-05	2.08E-05	2.33E-05	2.57E-05	2.38E-05	1.78E-05	1.43E-05	1.32E-05	1.15E-05
Initial Lateral Dimension		σy	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256	3.256
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1329	0.1129	0.1152	0.1202	0.1230	0.2301	0.2461	0.1862	0.2212	0.2091	0.1897	0.1835	0.1490	0.1449	0.1474	0.1536	0.1577	0.1670	0.1778	0.1688	0.1430	0.1322	0.1310	0.1279
	NO2	g/vehicle/km	0.0221	0.0212	0.0215	0.0220	0.0222	0.0280	0.0288	0.0271	0.0398	0.0375	0.0338	0.0322	0.0297	0.0284	0.0294	0.0308	0.0315	0.0336	0.0361	0.0343	0.0281	0.0248	0.0243	0.0239
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0018***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0013***	***0.0029***	***0.0056***	***0.0101***	***0.0092***	***0.0077***	***0.0071***	***0.0046***	***0.0042***	***0.0045***	***0.0049***	***0.0052***	***0.0060***	***0.0067***	***0.0061***	***0.0043***	***0.0032***	***0.0030***	***0.0026***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.22E-03	8.47E-04	5.91E-04	4.55E-04	3.91E-04	8.44E-04	1.94E-03	3.73E-03	6.71E-03	6.15E-03	5.12E-03	4.73E-03	3.04E-03	2.77E-03	2.98E-03	3.27E-03	3.50E-03	3.99E-03	4.49E-03	4.10E-03	2.85E-03	2.15E-03	2.00E-03	1.72E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	6.09E-04	4.24E-04	2.96E-04	2.28E-04	1.96E-04	4.22E-04	9.69E-04	1.87E-03	3.35E-03	3.07E-03	2.56E-03	2.37E-03	1.52E-03	1.38E-03	1.49E-03	1.63E-03	1.75E-03	2.00E-03	2.25E-03	2.05E-03	1.42E-03	1.08E-03	9.99E-04	8.58E-04
	Emission in each Box of 1st jet	g/s	1.22E-04	8.47E-05	5.91E-05	4.55E-05	3.91E-05	8.44E-05	1.94E-04	3.73E-04	6.71E-04	6.15E-04	5.12E-04	4.73E-04	3.04E-04	2.77E-04	2.98E-04	3.27E-04	3.50E-04	3.99E-04	4.49E-04	4.10E-04	2.85E-04	2.15E-04	2.00E-04	1.72E-04
	Emission in each Box of 2nd jet	g/s	6.09E-05	4.24E-05	2.96E-05	2.28E-05	1.96E-05	4.22E-05	9.69E-05	1.87E-04	3.35E-04	3.07E-04	2.56E-04	2.37E-04	1.52E-04	1.38E-04	1.49E-04	1.63E-04	1.75E-04	2.00E-04	2.25E-04	2.05E-04	1.42E-04	1.08E-04	9.99E-05	8.58E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0003***	***0.0008***	***0.0018***	***0.0017***	***0.0014***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0010***	***0.0010***	***0.0012***	***0.0014***	***0.0012***	***0.0008***	***0.0006***	***0.0006***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	2.03E-04	1.59E-04	1.10E-04	8.35E-05	7.07E-05	1.03E-04	2.27E-04	5.43E-04	1.21E-03	1.10E-03	9.12E-04	8.32E-04	6.04E-04	5.43E-04	5.94E-04	6.54E-04	6.98E-04	8.03E-04	9.13E-04	8.32E-04	5.59E-04	4.04E-04	3.71E-04	3.20E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	1.02E-04	7.96E-05	5.52E-05	4.17E-05	3.54E-05	5.14E-05	1.13E-04	2.72E-04	6.03E-04	5.52E-04	4.56E-04	4.16E-04	3.02E-04	2.71E-04	2.97E-04	3.27E-04	3.49E-04	4.01E-04	4.57E-04	4.16E-04	2.80E-04	2.02E-04	1.85E-04	1.60E-04
	Emission in each Box of 1st jet	g/s	2.03E-05	1.59E-05	1.10E-05	8.35E-06	7.07E-06	1.03E-05	2.27E-05	5.43E-05	1.21E-04	1.10E-04	9.12E-05	8.32E-05	6.04E-05	5.43E-05	5.94E-05	6.54E-05	6.98E-05	8.03E-05	9.13E-05	8.32E-05	5.59E-05	4.04E-05	3.71E-05	3.20E-05
	Emission in each Box of 2nd jet	g/s	1.02E-05	7.96E-06	5.52E-06	4.17E-06	3.54E-06	5.14E-06	1.13E-05	2.72E-05	6.03E-05	5.52E-05	4.56E-05	4.16E-05	3.02E-05	2.71E-05	2.97E-05	3.27E-05	3.49E-05	4.01E-05	4.57E-05	4.16E-05	2.80E-05	2.02E-05	1.85E-05	1.60E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1237	0.1039	0.1057	0.1118	0.1143	0.2147	0.2275	0.1736	0.2043	0.1905	0.1742	0.1685	0.1368	0.1340	0.1375	0.1420	0.1455	0.1549	0.1647	0.1577	0.1334	0.1236	0.1209	0.1180
	NO2	g/vehicle/km	0.0208	0.0198	0.0200	0.0207	0.0209	0.0263	0.0268	0.0255	0.0371	0.0347	0.0313	0.0299	0.0275	0.0265	0.0277	0.0287	0.0294	0.0315	0.0339	0.0323	0.0265	0.0234	0.0227	0.0223
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0027***	***0.0052***	***0.0093***	***0.0084***	***0.0070***	***0.0065***	***0.0042***	***0.0038***	***0.0042***	***0.0045***	***0.0048***	***0.0056***	***0.0062***	***0.0057***	***0.0040***	***0.0030***	***0.0028***	***0.0024***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.13E-03	7.80E-04	5.42E-04	4.23E-04	3.64E-04	7.88E-04	1.79E-03	3.48E-03	6.19E-03	5.60E-03	4.70E-03	4.34E-03	2.79E-03	2.56E-03	2.78E-03	3.02E-03	3.23E-03	3.70E-03	4.16E-03	3.83E-03	2.66E-03	2.01E-03	1.84E-03	1.58E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.67E-04	3.90E-04	2.71E-04	2.12E-04	1.82E-04	3.94E-04	8.96E-04	1.74E-03	3.10E-03	2.80E-03	2.35E-03	2.17E-03	1.39E-03	1.28E-03	1.39E-03	1.51E-03	1.61E-03	1.85E-03	2.08E-03	1.91E-03	1.33E-03	1.01E-03	9.22E-04	7.91E-04
	Emission in each Box of 1st jet	g/s	1.13E-04	7.80E-05	5.42E-05	4.23E-05	3.64E-05	7.88E-05	1.79E-04	3.48E-04	6.19E-04	5.60E-04	4.70E-04	4.34E-04	2.79E-04	2.56E-04	2.78E-04	3.02E-04	3.23E-04	3.70E-04	4.16E-04	3.83E-04	2.66E-04	2.01E-04	1.84E-04	1.58E-04
	Emission in each Box of 2nd jet	g/s	5.67E-05	3.90E-05	2.71E-05	2.12E-05	1.82E-05	3.94E-05	8.96E-05	1.74E-04	3.10E-04	2.80E-04	2.35E-04	2.17E-04	1.39E-04	1.28E-04	1.39E-04	1.51E-04	1.61E-04	1.85E-04	2.08E-04	1.91E-04	1.33E-04	1.01E-04	9.22E-05	7.91E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0015***	***0.0013***	***0.0012***	***0.0008***	***0.0008***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.91E-04	1.49E-04	1.03E-04	7.86E-05	6.65E-05	9.65E-05	2.11E-04	5.11E-04	1.12E-03	1.02E-03	8.45E-04	7.71E-04	5.59E-04	5.07E-04	5.60E-04	6.10E-04	6.51E-04	7.53E-04	8.56E-04	7.83E-04	5.27E-04	3.82E-04	3.46E-04	2.99E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.55E-05	7.44E-05	5.14E-05	3.93E-05	3.32E-05	4.82E-05	1.06E-04	2.56E-04	5.62E-04	5.10E-04	4.22E-04	3.86E-04	2.80E-04	2.54E-04	2.80E-04	3.05E-04	3.25E-04	3.76E-04	4.28E-04	3.92E-04	2.63E-04	1.91E-04	1.73E-04	1.49E-04
	Emission in each Box of 1st jet	g/s	1.91E-05	1.49E-05	1.03E-05	7.86E-06	6.65E-06	9.65E-06	2.11E-05	5.11E-05	1.12E-04	1.02E-04	8.45E-05	7.71E-05	5.59E-05	5.07E-05	5.60E-05	6.10E-05	6.51E-05	7.53E-05	8.56E-05	7.83E-05	5.27E-05	3.82E-05	3.46E-05	2.99E-05
	Emission in each Box of 2nd jet	g/s	9.55E-06	7.44E-06	5.14E-06	3.93E-06	3.32E-06	4.82E-06	1.06E-05	2.56E-05	5.62E-05	5.10E-05	4.22E-05	3.86E-05	2.80E-05	2.54E-05	2.80E-05	3.05E-05	3.25E-05	3.76E-05	4.28E-05	3.92E-05	2.63E-05	1.91E-05	1.73E-05	1.49E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1164	0.0977	0.0997	0.1038	0.1061	0.2007	0.2132	0.1628	0.1922	0.1811	0.1636	0.1605	0.1303	0.1256	0.1289	0.1348	0.1367	0.1462	0.1565	0.1484	0.1250	0.1157	0.1132	0.1107
	NO2	g/vehicle/km	0.0197	0.0188	0.0191	0.0195	0.0197	0.0248	0.0253	0.0241	0.0351	0.0331	0.0296	0.0286	0.0263	0.0250	0.0261	0.0273	0.0277	0.0299	0.0323	0.0306	0.0250	0.0221	0.0214	0.0210
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0011***	***0.0025***	***0.0049***	***0.0087***	***0.0080***	***0.0066***	***0.0062***	***0.0040***	***0.0036***	***0.0039***	***0.0043***	***0.0045***	***0.0052***	***0.0059***	***0.0054***	***0.0037***	***0.0028***	***0.0026***	***0.0022***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.07E-03	7.34E-04	5.12E-04	3.93E-04	3.38E-04	7.36E-04	1.68E-03	3.26E-03	5.83E-03	5.32E-03	4.41E-03	4.14E-03	2.65E-03	2.40E-03	2.61E-03	2.87E-03	3.03E-03	3.49E-03	3.95E-03	3.60E-03	2.49E-03	1.88E-03	1.73E-03	1.49E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.34E-04	3.67E-04	2.56E-04	1.96E-04	1.69E-04	3.68E-04	8.40E-04	1.63E-03	2.91E-03	2.66E-03	2.21E-03	2.07E-03	1.33E-03	1.20E-03	1.30E-03	1.43E-03	1.51E-03	1.75E-03	1.98E-03	1.80E-03	1.24E-03	9.42E-04	8.63E-04	7.43E-04
	Emission in each Box of 1st jet	g/s	1.07E-04	7.34E-05	5.12E-05	3.93E-05	3.38E-05	7.36E-05	1.68E-04	3.26E-04	5.83E-04	5.32E-04	4.41E-04	4.14E-04	2.65E-04	2.40E-04	2.61E-04	2.87E-04	3.03E-04	3.49E-04	3.95E-04	3.60E-04	2.49E-04	1.88E-04	1.73E-04	1.49E-04
	Emission in each Box of 2nd jet	g/s	5.34E-05	3.67E-05	2.56E-05	1.96E-05	1.69E-05	3.68E-05	8.40E-05	1.63E-04	2.91E-04	2.66E-04	2.21E-04	2.07E-04	1.33E-04	1.20E-04	1.30E-04	1.43E-04	1.51E-04	1.75E-04	1.98E-04	1.80E-04	1.24E-04	9.42E-05	8.63E-05	7.43E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0016***	***0.0015***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0009***	***0.0011***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.81E-04	1.41E-04	9.79E-05	7.39E-05	6.25E-05	9.08E-05	1.99E-04	4.83E-04	1.06E-03	9.72E-04	7.98E-04	7.38E-04	5.35E-04	4.78E-04	5.27E-04	5.81E-04	6.14E-04	7.15E-04	8.17E-04	7.44E-04	4.97E-04	3.60E-04	3.27E-04	2.82E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.05E-05	7.07E-05	4.89E-05	3.69E-05	3.13E-05	4.54E-05	9.96E-05	2.41E-04	5.32E-04	4.86E-04	3.99E-04	3.69E-04	2.68E-04	2.39E-04	2.64E-04	2.91E-04	3.07E-04	3.57E-04	4.09E-04	3.72E-04	2.49E-04	1.80E-04	1.63E-04	1.41E-04
	Emission in each Box of 1st jet	g/s	1.81E-05	1.41E-05	9.79E-06	7.39E-06	6.25E-06	9.08E-06	1.99E-05	4.83E-05	1.06E-04	9.72E-05	7.98E-05	7.38E-05	5.35E-05	4.78E-05	5.27E-05	5.81E-05	6.14E-05	7.15E-05	8.17E-05	7.44E-05	4.97E-05	3.60E-05	3.27E-05	2.82E-05
	Emission in each Box of 2nd jet	g/s	9.05E-06	7.07E-06	4.89E-06	3.69E-06	3.13E-06	4.54E-06	9.96E-06	2.41E-05	5.32E-05	4.86E-05	3.99E-05	3.69E-05	2.68E-05	2.39E-05	2.64E-05	2.91E-05	3.07E-05	3.57E-05	4.09E-05	3.72E-05	2.49E-05	1.80E-05	1.63E-05	1.41E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involved	104P3
Road Located	089
Vehicle EF Adopted	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1090	0.0914	0.0927	0.0991	0.1013	0.1929	0.2050	0.1549	0.1828	0.1724	0.1556	0.1524	0.1236	0.1212	0.1245	0.1278	0.1323	0.1389	0.1488	0.1403	0.1184	0.1114	0.1085	0.1057
	NO2	g/vehicle/km	0.0186	0.0178	0.0180	0.0188	0.0189	0.0239	0.0244	0.0230	0.0336	0.0316	0.0282	0.0272	0.0251	0.0243	0.0252	0.0260	0.0269	0.0285	0.0308	0.0291	0.0237	0.0214	0.0206	0.0202
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0006***	***0.0005***	***0.0011***	***0.0024***	***0.0047***	***0.0083***	***0.0076***	***0.0063***	***0.0059***	***0.0038***	***0.0035***	***0.0038***	***0.0041***	***0.0044***	***0.0050***	***0.0056***	***0.0051***	***0.0035***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.00E-03	6.86E-04	4.76E-04	3.75E-04	3.22E-04	7.08E-04	1.61E-03	3.10E-03	5.54E-03	5.07E-03	4.20E-03	3.93E-03	2.52E-03	2.32E-03	2.52E-03	2.72E-03	2.93E-03	3.32E-03	3.76E-03	3.41E-03	2.36E-03	1.81E-03	1.65E-03	1.42E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.00E-04	3.43E-04	2.38E-04	1.88E-04	1.61E-04	3.54E-04	8.07E-04	1.55E-03	2.77E-03	2.53E-03	2.10E-03	1.96E-03	1.26E-03	1.16E-03	1.26E-03	1.36E-03	1.47E-03	1.66E-03	1.88E-03	1.70E-03	1.18E-03	9.07E-04	8.27E-04	7.09E-04
	Emission in each Box of 1st jet	g/s	1.00E-04	6.86E-05	4.76E-05	3.75E-05	3.22E-05	7.08E-05	1.61E-04	3.10E-04	5.54E-04	5.07E-04	4.20E-04	3.93E-04	2.52E-04	2.32E-04	2.52E-04	2.72E-04	2.93E-04	3.32E-04	3.76E-04	3.41E-04	2.36E-04	1.81E-04	1.65E-04	1.42E-04
	Emission in each Box of 2nd jet	g/s	5.00E-05	3.43E-05	2.38E-05	1.88E-05	1.61E-05	3.54E-05	8.07E-05	1.55E-04	2.77E-04	2.53E-04	2.10E-04	1.96E-04	1.26E-04	1.16E-04	1.26E-04	1.36E-04	1.47E-04	1.66E-04	1.88E-04	1.70E-04	1.18E-04	9.07E-05	8.27E-05	7.09E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0011***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0008***	***0.0009***	***0.0010***	***0.0012***	***0.0011***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.71E-04	1.34E-04	9.22E-05	7.11E-05	6.01E-05	8.76E-05	1.92E-04	4.61E-04	1.02E-03	9.29E-04	7.61E-04	7.03E-04	5.11E-04	4.63E-04	5.10E-04	5.54E-04	5.96E-04	6.81E-04	7.79E-04	7.06E-04	4.73E-04	3.48E-04	3.15E-04	2.71E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.55E-05	6.68E-05	4.61E-05	3.55E-05	3.01E-05	4.38E-05	9.61E-05	2.30E-04	5.09E-04	4.65E-04	3.80E-04	3.51E-04	2.55E-04	2.32E-04	2.55E-04	2.77E-04	2.98E-04	3.41E-04	3.89E-04	3.53E-04	2.36E-04	1.74E-04	1.57E-04	1.35E-04
	Emission in each Box of 1st jet	g/s	1.71E-05	1.34E-05	9.22E-06	7.11E-06	6.01E-06	8.76E-06	1.92E-05	4.61E-05	1.02E-04	9.29E-05	7.61E-05	7.03E-05	5.11E-05	4.63E-05	5.10E-05	5.54E-05	5.96E-05	6.81E-05	7.79E-05	7.06E-05	4.73E-05	3.48E-05	3.15E-05	2.71E-05
	Emission in each Box of 2nd jet	g/s	8.55E-06	6.68E-06	4.61E-06	3.55E-06	3.01E-06	4.38E-06	9.61E-06	2.30E-05	5.09E-05	4.65E-05	3.80E-05	3.51E-05	2.55E-05	2.32E-05	2.55E-05	2.77E-05	2.98E-05	3.41E-05	3.89E-05	3.53E-05	2.36E-05	1.74E-05	1.57E-05	1.35E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0977	0.0811	0.0827	0.0859	0.0879	0.1680	0.1763	0.1341	0.1606	0.1506	0.1384	0.1352	0.1105	0.1078	0.1115	0.1140	0.1175	0.1252	0.1307	0.1256	0.1056	0.0966	0.0948	0.0922
	NO2	g/vehicle/km	0.0168	0.0160	0.0162	0.0165	0.0167	0.0210	0.0212	0.0201	0.0297	0.0279	0.0252	0.0243	0.0225	0.0217	0.0227	0.0234	0.0241	0.0259	0.0273	0.0262	0.0214	0.0188	0.0182	0.0178
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0040***	***0.0073***	***0.0066***	***0.0056***	***0.0052***	***0.0034***	***0.0031***	***0.0034***	***0.0036***	***0.0039***	***0.0045***	***0.0050***	***0.0046***	***0.0032***	***0.0024***	***0.0022***	***0.0019***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.96E-04	6.09E-04	4.25E-04	3.25E-04	2.80E-04	6.16E-04	1.39E-03	2.69E-03	4.87E-03	4.43E-03	3.73E-03	3.49E-03	2.25E-03	2.06E-03	2.25E-03	2.42E-03	2.61E-03	2.99E-03	3.30E-03	3.05E-03	2.10E-03	1.57E-03	1.44E-03	1.24E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.48E-04	3.05E-04	2.12E-04	1.63E-04	1.40E-04	3.08E-04	6.95E-04	1.34E-03	2.43E-03	2.21E-03	1.87E-03	1.74E-03	1.12E-03	1.03E-03	1.13E-03	1.21E-03	1.30E-03	1.50E-03	1.65E-03	1.52E-03	1.05E-03	7.86E-04	7.22E-04	6.18E-04
	Emission in each Box of 1st jet	g/s	8.96E-05	6.09E-05	4.25E-05	3.25E-05	2.80E-05	6.16E-05	1.39E-04	2.69E-04	4.87E-04	4.43E-04	3.73E-04	3.49E-04	2.25E-04	2.06E-04	2.25E-04	2.42E-04	2.61E-04	2.99E-04	3.30E-04	3.05E-04	2.10E-04	1.57E-04	1.44E-04	1.24E-04
	Emission in each Box of 2nd jet	g/s	4.48E-05	3.05E-05	2.12E-05	1.63E-05	1.40E-05	3.08E-05	6.95E-05	1.34E-04	2.43E-04	2.21E-04	1.87E-04	1.74E-04	1.12E-04	1.03E-04	1.13E-04	1.21E-04	1.30E-04	1.50E-04	1.65E-04	1.52E-04	1.05E-04	7.86E-05	7.22E-05	6.18E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0014***	***0.0012***	***0.0010***	***0.0009***	***0.0007***	***0.0006***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0010***	***0.0006***	***0.0005***	***0.0004***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.54E-04	1.20E-04	8.32E-05	6.26E-05	5.30E-05	7.70E-05	1.67E-04	4.03E-04	9.01E-04	8.19E-04	6.81E-04	6.27E-04	4.59E-04	4.15E-04	4.59E-04	4.97E-04	5.33E-04	6.18E-04	6.90E-04	6.37E-04	4.27E-04	3.05E-04	2.78E-04	2.39E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.72E-05	6.01E-05	4.16E-05	3.13E-05	2.65E-05	3.85E-05	8.35E-05	2.01E-04	4.50E-04	4.09E-04	3.40E-04	3.13E-04	2.29E-04	2.07E-04	2.30E-04	2.48E-04	2.67E-04	3.09E-04	3.45E-04	3.18E-04	2.13E-04	1.53E-04	1.39E-04	1.19E-04
	Emission in each Box of 1st jet	g/s	1.54E-05	1.20E-05	8.32E-06	6.26E-06	5.30E-06	7.70E-06	1.67E-05	4.03E-05	9.01E-05	8.19E-05	6.81E-05	6.27E-05	4.59E-05	4.15E-05	4.59E-05	4.97E-05	5.33E-05	6.18E-05	6.90E-05	6.37E-05	4.27E-05	3.05E-05	2.78E-05	2.39E-05
	Emission in each Box of 2nd jet	g/s	7.72E-06	6.01E-06	4.16E-06	3.13E-06	2.65E-06	3.85E-06	8.35E-06	2.01E-05	4.50E-05	4.09E-05	3.40E-05	3.13E-05	2.29E-05	2.07E-05	2.30E-05	2.48E-05	2.67E-05	3.09E-05	3.45E-05	3.18E-05	2.13E-05	1.53E-05	1.39E-05	1.19E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0941	0.0786	0.0822	0.0854	0.0869	0.1661	0.1722	0.1324	0.1569	0.1502	0.1338	0.1306	0.1060	0.1042	0.1062	0.1101	0.1155	0.1221	0.1283	0.1241	0.1044	0.0960	0.0936	0.0916
	NO2	g/vehicle/km	0.0163	0.0155	0.0161	0.0165	0.0165	0.0208	0.0207	0.0199	0.0291	0.0278	0.0245	0.0236	0.0217	0.0211	0.0218	0.0227	0.0237	0.0253	0.0269	0.0260	0.0212	0.0187	0.0180	0.0177
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0040***	***0.0071***	***0.0066***	***0.0054***	***0.0051***	***0.0032***	***0.0030***	***0.0032***	***0.0035***	***0.0038***	***0.0044***	***0.0049***	***0.0045***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.64E-04	5.90E-04	4.22E-04	3.23E-04	2.76E-04	6.09E-04	1.36E-03	2.65E-03	4.76E-03	4.41E-03	3.61E-03	3.37E-03	2.16E-03	1.99E-03	2.15E-03	2.34E-03	2.56E-03	2.92E-03	3.24E-03	3.01E-03	2.08E-03	1.56E-03	1.43E-03	1.23E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.32E-04	2.95E-04	2.11E-04	1.62E-04	1.38E-04	3.05E-04	6.78E-04	1.33E-03	2.38E-03	2.21E-03	1.80E-03	1.68E-03	1.08E-03	9.95E-04	1.07E-03	1.17E-03	1.28E-03	1.46E-03	1.62E-03	1.51E-03	1.04E-03	7.81E-04	7.14E-04	6.14E-04
	Emission in each Box of 1st jet	g/s	8.64E-05	5.90E-05	4.22E-05	3.23E-05	2.76E-05	6.09E-05	1.36E-04	2.65E-04	4.76E-04	4.41E-04	3.61E-04	3.37E-04	2.16E-04	1.99E-04	2.15E-04	2.34E-04	2.56E-04	2.92E-04	3.24E-04	3.01E-04	2.08E-04	1.56E-04	1.43E-04	1.23E-04
	Emission in each Box of 2nd jet	g/s	4.32E-05	2.95E-05	2.11E-05	1.62E-05	1.38E-05	3.05E-05	6.78E-05	1.33E-04	2.38E-04	2.21E-04	1.80E-04	1.68E-04	1.08E-04	9.95E-05	1.07E-04	1.17E-04	1.28E-04	1.46E-04	1.62E-04	1.51E-04	1.04E-04	7.81E-05	7.14E-05	6.14E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0007***	***0.0006***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.49E-04	1.17E-04	8.27E-05	6.23E-05	5.24E-05	7.62E-05	1.63E-04	3.98E-04	8.83E-04	8.18E-04	6.61E-04	6.09E-04	4.42E-04	4.03E-04	4.40E-04	4.82E-04	5.26E-04	6.04E-04	6.79E-04	6.30E-04	4.22E-04	3.04E-04	2.75E-04	2.38E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.47E-05	5.84E-05	4.14E-05	3.12E-05	2.62E-05	3.81E-05	8.17E-05	1.99E-04	4.42E-04	4.09E-04	3.31E-04	3.04E-04	2.21E-04	2.01E-04	2.20E-04	2.41E-04	2.63E-04	3.02E-04	3.40E-04	3.15E-04	2.11E-04	1.52E-04	1.38E-04	1.19E-04
	Emission in each Box of 1st jet	g/s	1.49E-05	1.17E-05	8.27E-06	6.23E-06	5.24E-06	7.62E-06	1.63E-05	3.98E-05	8.83E-05	8.18E-05	6.61E-05	6.09E-05	4.42E-05	4.03E-05	4.40E-05	4.82E-05	5.26E-05	6.04E-05	6.79E-05	6.30E-05	4.22E-05	3.04E-05	2.75E-05	2.38E-05
	Emission in each Box of 2nd jet	g/s	7.47E-06	5.84E-06	4.14E-06	3.12E-06	2.62E-06	3.81E-06	8.17E-06	1.99E-05	4.42E-05	4.09E-05	3.31E-05	3.04E-05	2.21E-05	2.01E-05	2.20E-05	2.41E-05	2.63E-05	3.02E-05	3.40E-05	3.15E-05	2.11E-05	1.52E-05	1.38E-05	1.19E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0948	0.0781	0.0796	0.0826	0.0845	0.1608	0.1722	0.1290	0.1531	0.1452	0.1344	0.1323	0.1040	0.1023	0.1075	0.1107	0.1134	0.1218	0.1268	0.1227	0.1025	0.0948	0.0924	0.0892
	NO2	g/vehicle/km	0.0164	0.0155	0.0157	0.0160	0.0161	0.0202	0.0207	0.0194	0.0284	0.0269	0.0246	0.0239	0.0214	0.0207	0.0220	0.0228	0.0233	0.0252	0.0266	0.0257	0.0208	0.0184	0.0178	0.0173
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0039***	***0.0070***	***0.0064***	***0.0054***	***0.0051***	***0.0032***	***0.0029***	***0.0033***	***0.0035***	***0.0038***	***0.0044***	***0.0048***	***0.0045***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.69E-04	5.87E-04	4.09E-04	3.13E-04	2.69E-04	5.90E-04	1.36E-03	2.59E-03	4.64E-03	4.27E-03	3.63E-03	3.41E-03	2.12E-03	1.95E-03	2.18E-03	2.35E-03	2.51E-03	2.91E-03	3.20E-03	2.98E-03	2.04E-03	1.54E-03	1.41E-03	1.20E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.35E-04	2.93E-04	2.04E-04	1.56E-04	1.34E-04	2.95E-04	6.78E-04	1.29E-03	2.32E-03	2.13E-03	1.81E-03	1.71E-03	1.06E-03	9.77E-04	1.09E-03	1.18E-03	1.26E-03	1.45E-03	1.60E-03	1.49E-03	1.02E-03	7.71E-04	7.05E-04	5.98E-04
	Emission in each Box of 1st jet	g/s	8.69E-05	5.87E-05	4.09E-05	3.13E-05	2.69E-05	5.90E-05	1.36E-04	2.59E-04	4.64E-04	4.27E-04	3.63E-04	3.41E-04	2.12E-04	1.95E-04	2.18E-04	2.35E-04	2.51E-04	2.91E-04	3.20E-04	2.98E-04	2.04E-04	1.54E-04	1.41E-04	1.20E-04
	Emission in each Box of 2nd jet	g/s	4.35E-05	2.93E-05	2.04E-05	1.56E-05	1.34E-05	2.95E-05	6.78E-05	1.29E-04	2.32E-04	2.13E-04	1.81E-04	1.71E-04	1.06E-04	9.77E-05	1.09E-04	1.18E-04	1.26E-04	1.45E-04	1.60E-04	1.49E-04	1.02E-04	7.71E-05	7.05E-05	5.98E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0007***	***0.0006***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.50E-04	1.16E-04	8.04E-05	6.05E-05	5.12E-05	7.41E-05	1.63E-04	3.89E-04	8.61E-04	7.91E-04	6.63E-04	6.15E-04	4.35E-04	3.96E-04	4.45E-04	4.84E-04	5.16E-04	6.02E-04	6.72E-04	6.23E-04	4.14E-04	3.00E-04	2.72E-04	2.32E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.52E-05	5.81E-05	4.02E-05	3.03E-05	2.56E-05	3.70E-05	8.17E-05	1.95E-04	4.31E-04	3.95E-04	3.32E-04	3.08E-04	2.18E-04	1.98E-04	2.23E-04	2.42E-04	2.58E-04	3.01E-04	3.36E-04	3.12E-04	2.07E-04	1.50E-04	1.36E-04	1.16E-04
	Emission in each Box of 1st jet	g/s	1.50E-05	1.16E-05	8.04E-06	6.05E-06	5.12E-06	7.41E-06	1.63E-05	3.89E-05	8.61E-05	7.91E-05	6.63E-05	6.15E-05	4.35E-05	3.96E-05	4.45E-05	4.84E-05	5.16E-05	6.02E-05	6.72E-05	6.23E-05	4.14E-05	3.00E-05	2.72E-05	2.32E-05
	Emission in each Box of 2nd jet	g/s	7.52E-06	5.81E-06	4.02E-06	3.03E-06	2.56E-06	3.70E-06	8.17E-06	1.95E-05	4.31E-05	3.95E-05	3.32E-05	3.08E-05	2.18E-05	1.98E-05	2.23E-05	2.42E-05	2.58E-05	3.01E-05	3.36E-05	3.12E-05	2.07E-05	1.50E-05	1.36E-05	1.16E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 104C01-104C20
Enclosure Involvec: 104P3
Road Located: 089
Vehicle EF Adopte: 104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0960	0.0797	0.0813	0.0844	0.0863	0.1642	0.1757	0.1324	0.1550	0.1457	0.1365	0.1324	0.1060	0.1042	0.1069	0.1101	0.1162	0.1213	0.1306	0.1226	0.1026	0.0948	0.0925	0.0904
	NO2	g/vehicle/km	0.0166	0.0158	0.0160	0.0163	0.0164	0.0206	0.0211	0.0199	0.0287	0.0270	0.0250	0.0239	0.0217	0.0211	0.0219	0.0227	0.0239	0.0251	0.0273	0.0257	0.0208	0.0185	0.0178	0.0175
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0040***	***0.0070***	***0.0064***	***0.0055***	***0.0051***	***0.0032***	***0.0030***	***0.0032***	***0.0035***	***0.0039***	***0.0043***	***0.0049***	***0.0045***	***0.0031***	***0.0023***	***0.0021***	***0.0018***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.81E-04	5.98E-04	4.17E-04	3.20E-04	2.75E-04	6.03E-04	1.38E-03	2.65E-03	4.70E-03	4.28E-03	3.68E-03	3.41E-03	2.16E-03	1.99E-03	2.16E-03	2.34E-03	2.58E-03	2.90E-03	3.30E-03	2.98E-03	2.04E-03	1.54E-03	1.41E-03	1.21E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.40E-04	2.99E-04	2.09E-04	1.60E-04	1.37E-04	3.01E-04	6.92E-04	1.33E-03	2.35E-03	2.14E-03	1.84E-03	1.71E-03	1.08E-03	9.95E-04	1.08E-03	1.17E-03	1.29E-03	1.45E-03	1.65E-03	1.49E-03	1.02E-03	7.72E-04	7.05E-04	6.06E-04
	Emission in each Box of 1st jet	g/s	8.81E-05	5.98E-05	4.17E-05	3.20E-05	2.75E-05	6.03E-05	1.38E-04	2.65E-04	4.70E-04	4.28E-04	3.68E-04	3.41E-04	2.16E-04	1.99E-04	2.16E-04	2.34E-04	2.58E-04	2.90E-04	3.30E-04	2.98E-04	2.04E-04	1.54E-04	1.41E-04	1.21E-04
	Emission in each Box of 2nd jet	g/s	4.40E-05	2.99E-05	2.09E-05	1.60E-05	1.37E-05	3.01E-05	6.92E-05	1.33E-04	2.35E-04	2.14E-04	1.84E-04	1.71E-04	1.08E-04	9.95E-05	1.08E-04	1.17E-04	1.29E-04	1.45E-04	1.65E-04	1.49E-04	1.02E-04	7.72E-05	7.05E-05	6.06E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0007***	***0.0006***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.52E-04	1.18E-04	8.19E-05	6.17E-05	5.22E-05	7.55E-05	1.66E-04	3.98E-04	8.71E-04	7.93E-04	6.73E-04	6.16E-04	4.42E-04	4.03E-04	4.43E-04	4.82E-04	5.29E-04	6.01E-04	6.90E-04	6.24E-04	4.14E-04	3.01E-04	2.72E-04	2.35E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.61E-05	5.91E-05	4.09E-05	3.09E-05	2.61E-05	3.77E-05	8.32E-05	1.99E-04	4.36E-04	3.97E-04	3.37E-04	3.08E-04	2.21E-04	2.01E-04	2.22E-04	2.41E-04	2.64E-04	3.00E-04	3.45E-04	3.12E-04	2.07E-04	1.50E-04	1.36E-04	1.17E-04
	Emission in each Box of 1st jet	g/s	1.52E-05	1.18E-05	8.19E-06	6.17E-06	5.22E-06	7.55E-06	1.66E-05	3.98E-05	8.71E-05	7.93E-05	6.73E-05	6.16E-05	4.42E-05	4.03E-05	4.43E-05	4.82E-05	5.29E-05	6.01E-05	6.90E-05	6.24E-05	4.14E-05	3.01E-05	2.72E-05	2.35E-05
	Emission in each Box of 2nd jet	g/s	7.61E-06	5.91E-06	4.09E-06	3.09E-06	2.61E-06	3.77E-06	8.32E-06	1.99E-05	4.36E-05	3.97E-05	3.37E-05	3.08E-05	2.21E-05	2.01E-05	2.22E-05	2.41E-05	2.64E-05	3.00E-05	3.45E-05	3.12E-05	2.07E-05	1.50E-05	1.36E-05	1.17E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0953	0.0791	0.0806	0.0832	0.0879	0.1670	0.1776	0.1307	0.1563	0.1474	0.1384	0.1324	0.1074	0.1070	0.1091	0.1131	0.1151	0.1209	0.1299	0.1211	0.1056	0.0972	0.0948	0.0927
	NO2	g/vehicle/km	0.0165	0.0156	0.0158	0.0161	0.0167	0.0209	0.0213	0.0196	0.0290	0.0273	0.0252	0.0238	0.0220	0.0216	0.0223	0.0232	0.0236	0.0250	0.0272	0.0254	0.0214	0.0189	0.0182	0.0179
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0013***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0021***	***0.0039***	***0.0071***	***0.0065***	***0.0056***	***0.0051***	***0.0033***	***0.0031***	***0.0033***	***0.0036***	***0.0038***	***0.0043***	***0.0049***	***0.0044***	***0.0032***	***0.0024***	***0.0022***	***0.0019***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.75E-04	5.94E-04	4.14E-04	3.15E-04	2.80E-04	6.13E-04	1.40E-03	2.62E-03	4.74E-03	4.33E-03	3.73E-03	3.41E-03	2.19E-03	2.04E-03	2.21E-03	2.40E-03	2.55E-03	2.89E-03	3.28E-03	2.94E-03	2.10E-03	1.58E-03	1.44E-03	1.24E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.37E-04	2.97E-04	2.07E-04	1.58E-04	1.40E-04	3.06E-04	7.00E-04	1.31E-03	2.37E-03	2.17E-03	1.87E-03	1.71E-03	1.09E-03	1.02E-03	1.10E-03	1.20E-03	1.28E-03	1.45E-03	1.64E-03	1.47E-03	1.05E-03	7.91E-04	7.22E-04	6.22E-04
	Emission in each Box of 1st jet	g/s	8.75E-05	5.94E-05	4.14E-05	3.15E-05	2.80E-05	6.13E-05	1.40E-04	2.62E-04	4.74E-04	4.33E-04	3.73E-04	3.41E-04	2.19E-04	2.04E-04	2.21E-04	2.40E-04	2.55E-04	2.89E-04	3.28E-04	2.94E-04	2.10E-04	1.58E-04	1.44E-04	1.24E-04
	Emission in each Box of 2nd jet	g/s	4.37E-05	2.97E-05	2.07E-05	1.58E-05	1.40E-05	3.06E-05	7.00E-05	1.31E-04	2.37E-04	2.17E-04	1.87E-04	1.71E-04	1.09E-04	1.02E-04	1.10E-04	1.20E-04	1.28E-04	1.45E-04	1.64E-04	1.47E-04	1.05E-04	7.91E-05	7.22E-05	6.22E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0006***	***0.0013***	***0.0012***	***0.0010***	***0.0009***	***0.0007***	***0.0006***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0009***	***0.0006***	***0.0005***	***0.0004***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.51E-04	1.17E-04	8.13E-05	6.09E-05	5.30E-05	7.67E-05	1.68E-04	3.93E-04	8.79E-04	8.03E-04	6.81E-04	6.15E-04	4.47E-04	4.12E-04	4.51E-04	4.94E-04	5.23E-04	5.98E-04	6.87E-04	6.16E-04	4.27E-04	3.07E-04	2.78E-04	2.40E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	7.55E-05	5.87E-05	4.06E-05	3.04E-05	2.65E-05	3.83E-05	8.41E-05	1.97E-04	4.40E-04	4.01E-04	3.40E-04	3.07E-04	2.24E-04	2.06E-04	2.25E-04	2.47E-04	2.62E-04	2.99E-04	3.43E-04	3.08E-04	2.13E-04	1.54E-04	1.39E-04	1.20E-04
	Emission in each Box of 1st jet	g/s	1.51E-05	1.17E-05	8.13E-06	6.09E-06	5.30E-06	7.67E-06	1.68E-05	3.93E-05	8.79E-05	8.03E-05	6.81E-05	6.15E-05	4.47E-05	4.12E-05	4.51E-05	4.94E-05	5.23E-05	5.98E-05	6.87E-05	6.16E-05	4.27E-05	3.07E-05	2.78E-05	2.40E-05
	Emission in each Box of 2nd jet	g/s	7.55E-06	5.87E-06	4.06E-06	3.04E-06	2.65E-06	3.83E-06	8.41E-06	1.97E-05	4.40E-05	4.01E-05	3.40E-05	3.07E-05	2.24E-05	2.06E-05	2.25E-05	2.47E-05	2.62E-05	2.99E-05	3.43E-05	3.08E-05	2.13E-05	1.54E-05	1.39E-05	1.20E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section 104C01-104C20
Enclosure Involvec 104P3
Road Located 089
Vehicle EF Adopte 104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1080	0.0904	0.0918	0.0955	0.0973	0.1849	0.1974	0.1505	0.1776	0.1674	0.1509	0.1479	0.1207	0.1177	0.1209	0.1247	0.1285	0.1348	0.1459	0.1380	0.1169	0.1082	0.1057	0.1029
	NO2	g/vehicle/km	0.0185	0.0176	0.0178	0.0182	0.0182	0.0230	0.0236	0.0224	0.0327	0.0307	0.0274	0.0265	0.0244	0.0236	0.0245	0.0255	0.0262	0.0277	0.0303	0.0287	0.0235	0.0208	0.0202	0.0197
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0015***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0010***	***0.0023***	***0.0045***	***0.0081***	***0.0074***	***0.0061***	***0.0057***	***0.0037***	***0.0034***	***0.0037***	***0.0040***	***0.0043***	***0.0048***	***0.0055***	***0.0050***	***0.0035***	***0.0026***	***0.0024***	***0.0021***
	2/3 of NO emission rate in 1st 50m Box	g/s	9.90E-04	6.79E-04	4.71E-04	3.62E-04	3.09E-04	6.78E-04	1.55E-03	3.02E-03	5.38E-03	4.92E-03	4.07E-03	3.81E-03	2.46E-03	2.25E-03	2.45E-03	2.65E-03	2.85E-03	3.22E-03	3.68E-03	3.35E-03	2.33E-03	1.76E-03	1.61E-03	1.38E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.95E-04	3.39E-04	2.36E-04	1.81E-04	1.55E-04	3.39E-04	7.77E-04	1.51E-03	2.69E-03	2.46E-03	2.04E-03	1.91E-03	1.23E-03	1.12E-03	1.22E-03	1.33E-03	1.42E-03	1.61E-03	1.84E-03	1.67E-03	1.16E-03	8.81E-04	8.06E-04	6.90E-04
	Emission in each Box of 1st jet	g/s	9.90E-05	6.79E-05	4.71E-05	3.62E-05	3.09E-05	6.78E-05	1.55E-04	3.02E-04	5.38E-04	4.92E-04	4.07E-04	3.81E-04	2.46E-04	2.25E-04	2.45E-04	2.65E-04	2.85E-04	3.22E-04	3.68E-04	3.35E-04	2.33E-04	1.76E-04	1.61E-04	1.38E-04
	Emission in each Box of 2nd jet	g/s	4.95E-05	3.39E-05	2.36E-05	1.81E-05	1.55E-05	3.39E-05	7.77E-05	1.51E-04	2.69E-04	2.46E-04	2.04E-04	1.91E-04	1.23E-04	1.12E-04	1.22E-04	1.33E-04	1.42E-04	1.61E-04	1.84E-04	1.67E-04	1.16E-04	8.81E-05	8.06E-05	6.90E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0007***	***0.0015***	***0.0014***	***0.0011***	***0.0010***	***0.0007***	***0.0007***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.70E-04	1.32E-04	9.13E-05	6.89E-05	5.79E-05	8.44E-05	1.86E-04	4.49E-04	9.91E-04	9.03E-04	7.40E-04	6.84E-04	4.98E-04	4.50E-04	4.96E-04	5.41E-04	5.81E-04	6.63E-04	7.65E-04	6.95E-04	4.67E-04	3.39E-04	3.08E-04	2.65E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	8.48E-05	6.62E-05	4.57E-05	3.45E-05	2.89E-05	4.22E-05	9.29E-05	2.24E-04	4.96E-04	4.52E-04	3.70E-04	3.42E-04	2.49E-04	2.25E-04	2.48E-04	2.71E-04	2.90E-04	3.31E-04	3.82E-04	3.48E-04	2.34E-04	1.70E-04	1.54E-04	1.32E-04
	Emission in each Box of 1st jet	g/s	1.70E-05	1.32E-05	9.13E-06	6.89E-06	5.79E-06	8.44E-06	1.86E-05	4.49E-05	9.91E-05	9.03E-05	7.40E-05	6.84E-05	4.98E-05	4.50E-05	4.96E-05	5.41E-05	5.81E-05	6.63E-05	7.65E-05	6.95E-05	4.67E-05	3.39E-05	3.08E-05	2.65E-05
	Emission in each Box of 2nd jet	g/s	8.48E-06	6.62E-06	4.57E-06	3.45E-06	2.89E-06	4.22E-06	9.29E-06	2.24E-05	4.96E-05	4.52E-05	3.70E-05	3.42E-05	2.49E-05	2.25E-05	2.48E-05	2.71E-05	2.90E-05	3.31E-05	3.82E-05	3.48E-05	2.34E-05	1.70E-05	1.54E-05	1.32E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involved	104P3
Road Located	089
Vehicle EF Adopted	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1189	0.1011	0.1028	0.1080	0.1104	0.2091	0.2227	0.1696	0.2006	0.1897	0.1710	0.1666	0.1341	0.1308	0.1343	0.1387	0.1421	0.1518	0.1608	0.1546	0.1303	0.1206	0.1179	0.1154
	NO2	g/vehicle/km	0.0201	0.0194	0.0196	0.0202	0.0203	0.0257	0.0263	0.0250	0.0366	0.0346	0.0308	0.0296	0.0270	0.0260	0.0270	0.0280	0.0288	0.0309	0.0332	0.0318	0.0259	0.0230	0.0223	0.0219
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0016***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0012***	***0.0026***	***0.0051***	***0.0091***	***0.0084***	***0.0069***	***0.0064***	***0.0041***	***0.0037***	***0.0041***	***0.0044***	***0.0047***	***0.0054***	***0.0061***	***0.0056***	***0.0039***	***0.0029***	***0.0027***	***0.0023***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.09E-03	7.59E-04	5.28E-04	4.09E-04	3.51E-04	7.67E-04	1.75E-03	3.40E-03	6.08E-03	5.57E-03	4.61E-03	4.30E-03	2.73E-03	2.50E-03	2.72E-03	2.95E-03	3.15E-03	3.63E-03	4.06E-03	3.75E-03	2.59E-03	1.96E-03	1.80E-03	1.55E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.45E-04	3.79E-04	2.64E-04	2.04E-04	1.76E-04	3.84E-04	8.77E-04	1.70E-03	3.04E-03	2.79E-03	2.31E-03	2.15E-03	1.37E-03	1.25E-03	1.36E-03	1.47E-03	1.58E-03	1.81E-03	2.03E-03	1.88E-03	1.30E-03	9.81E-04	8.99E-04	7.74E-04
	Emission in each Box of 1st jet	g/s	1.09E-04	7.59E-05	5.28E-05	4.09E-05	3.51E-05	7.67E-05	1.75E-04	3.40E-04	6.08E-04	5.57E-04	4.61E-04	4.30E-04	2.73E-04	2.50E-04	2.72E-04	2.95E-04	3.15E-04	3.63E-04	4.06E-04	3.75E-04	2.59E-04	1.96E-04	1.80E-04	1.55E-04
	Emission in each Box of 2nd jet	g/s	5.45E-05	3.79E-05	2.64E-05	2.04E-05	1.76E-05	3.84E-05	8.77E-05	1.70E-04	3.04E-04	2.79E-04	2.31E-04	2.15E-04	1.37E-04	1.25E-04	1.36E-04	1.47E-04	1.58E-04	1.81E-04	2.03E-04	1.88E-04	1.30E-04	9.81E-05	8.99E-05	7.74E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0015***	***0.0012***	***0.0011***	***0.0008***	***0.0007***	***0.0008***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.84E-04	1.45E-04	1.01E-04	7.65E-05	6.47E-05	9.43E-05	2.07E-04	5.01E-04	1.11E-03	1.02E-03	8.31E-04	7.63E-04	5.49E-04	4.96E-04	5.46E-04	5.96E-04	6.38E-04	7.39E-04	8.38E-04	7.72E-04	5.16E-04	3.75E-04	3.40E-04	2.94E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.22E-05	7.27E-05	5.03E-05	3.83E-05	3.24E-05	4.71E-05	1.04E-04	2.51E-04	5.55E-04	5.08E-04	4.16E-04	3.82E-04	2.74E-04	2.48E-04	2.73E-04	2.98E-04	3.19E-04	3.70E-04	4.19E-04	3.86E-04	2.58E-04	1.87E-04	1.70E-04	1.47E-04
	Emission in each Box of 1st jet	g/s	1.84E-05	1.45E-05	1.01E-05	7.65E-06	6.47E-06	9.43E-06	2.07E-05	5.01E-05	1.11E-04	1.02E-04	8.31E-05	7.63E-05	5.49E-05	4.96E-05	5.46E-05	5.96E-05	6.38E-05	7.39E-05	8.38E-05	7.72E-05	5.16E-05	3.75E-05	3.40E-05	2.94E-05
	Emission in each Box of 2nd jet	g/s	9.22E-06	7.27E-06	5.03E-06	3.83E-06	3.24E-06	4.71E-06	1.04E-05	2.51E-05	5.55E-05	5.08E-05	4.16E-05	3.82E-05	2.74E-05	2.48E-05	2.73E-05	2.98E-05	3.19E-05	3.70E-05	4.19E-05	3.86E-05	2.58E-05	1.87E-05	1.70E-05	1.47E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104C01-104C20
Enclosure Involvec	104P3
Road Located	089
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	545	446	305	225	189	218	468	1191	1801	1746	1603	1532	1210	1135	1202	1263	1317	1420	1501	1442	1183	967	906	797
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1258	0.1062	0.1080	0.1128	0.1168	0.2194	0.2329	0.1774	0.2097	0.1980	0.1778	0.1736	0.1393	0.1360	0.1400	0.1442	0.1478	0.1574	0.1687	0.1600	0.1354	0.1251	0.1241	0.1214
	NO2	g/vehicle/km	0.0211	0.0202	0.0204	0.0210	0.0213	0.0268	0.0274	0.0260	0.0380	0.0358	0.0319	0.0307	0.0280	0.0270	0.0281	0.0291	0.0298	0.0319	0.0346	0.0328	0.0268	0.0237	0.0232	0.0228
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0017***	***0.0012***	***0.0008***	***0.0006***	***0.0006***	***0.0012***	***0.0028***	***0.0053***	***0.0095***	***0.0087***	***0.0072***	***0.0067***	***0.0043***	***0.0039***	***0.0042***	***0.0046***	***0.0049***	***0.0056***	***0.0064***	***0.0058***	***0.0040***	***0.0031***	***0.0028***	***0.0024***
	2/3 of NO emission rate in 1st 50m Box	g/s	1.15E-03	7.97E-04	5.54E-04	4.27E-04	3.72E-04	8.05E-04	1.83E-03	3.56E-03	6.36E-03	5.82E-03	4.80E-03	4.48E-03	2.84E-03	2.60E-03	2.83E-03	3.07E-03	3.28E-03	3.76E-03	4.26E-03	3.88E-03	2.70E-03	2.04E-03	1.89E-03	1.63E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	5.77E-04	3.99E-04	2.77E-04	2.14E-04	1.86E-04	4.03E-04	9.17E-04	1.78E-03	3.18E-03	2.91E-03	2.40E-03	2.24E-03	1.42E-03	1.30E-03	1.42E-03	1.53E-03	1.64E-03	1.88E-03	2.13E-03	1.94E-03	1.35E-03	1.02E-03	9.46E-04	8.14E-04
	Emission in each Box of 1st jet	g/s	1.15E-04	7.97E-05	5.54E-05	4.27E-05	3.72E-05	8.05E-05	1.83E-04	3.56E-04	6.36E-04	5.82E-04	4.80E-04	4.48E-04	2.84E-04	2.60E-04	2.83E-04	3.07E-04	3.28E-04	3.76E-04	4.26E-04	3.88E-04	2.70E-04	2.04E-04	1.89E-04	1.63E-04
	Emission in each Box of 2nd jet	g/s	5.77E-05	3.99E-05	2.77E-05	2.14E-05	1.86E-05	4.03E-05	9.17E-05	1.78E-04	3.18E-04	2.91E-04	2.40E-04	2.24E-04	1.42E-04	1.30E-04	1.42E-04	1.53E-04	1.64E-04	1.88E-04	2.13E-04	1.94E-04	1.35E-04	1.02E-04	9.46E-05	8.14E-05
NO_2 Emission Rate		g/s	***0.0003***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0003***	***0.0008***	***0.0017***	***0.0016***	***0.0013***	***0.0012***	***0.0009***	***0.0008***	***0.0009***	***0.0009***	***0.0010***	***0.0011***	***0.0013***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0005***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.94E-04	1.52E-04	1.05E-04	7.94E-05	6.78E-05	9.84E-05	2.16E-04	5.21E-04	1.15E-03	1.05E-03	8.60E-04	7.91E-04	5.70E-04	5.15E-04	5.68E-04	6.19E-04	6.60E-04	7.63E-04	8.73E-04	7.95E-04	5.34E-04	3.86E-04	3.54E-04	3.06E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	9.69E-05	7.59E-05	5.24E-05	3.97E-05	3.39E-05	4.92E-05	1.08E-04	2.60E-04	5.76E-04	5.26E-04	4.30E-04	3.96E-04	2.85E-04	2.57E-04	2.84E-04	3.09E-04	3.30E-04	3.81E-04	4.37E-04	3.98E-04	2.67E-04	1.93E-04	1.77E-04	1.53E-04
	Emission in each Box of 1st jet	g/s	1.94E-05	1.52E-05	1.05E-05	7.94E-06	6.78E-06	9.84E-06	2.16E-05	5.21E-05	1.15E-04	1.05E-04	8.60E-05	7.91E-05	5.70E-05	5.15E-05	5.68E-05	6.19E-05	6.60E-05	7.63E-05	8.73E-05	7.95E-05	5.34E-05	3.86E-05	3.54E-05	3.06E-05
	Emission in each Box of 2nd jet	g/s	9.69E-06	7.59E-06	5.24E-06	3.97E-06	3.39E-06	4.92E-06	1.08E-05	2.60E-05	5.76E-05	5.26E-05	4.30E-05	3.96E-05	2.85E-05	2.57E-05	2.84E-05	3.09E-05	3.30E-05	3.81E-05	4.37E-05	3.98E-05	2.67E-05	1.93E-05	1.77E-05	1.53E-05
RSP Emission Rate		g/s	***1.18E-04***	***8.02E-05***	***5.62E-05***	***4.34E-05***	***3.74E-05***	***8.29E-05***	***1.89E-04***	***3.51E-04***	***5.40E-04***	***5.01E-04***	***4.36E-04***	***4.10E-04***	***2.67E-04***	***2.50E-04***	***2.66E-04***	***2.84E-04***	***2.97E-04***	***3.34E-04***	***3.67E-04***	***3.39E-04***	***2.54E-04***	***2.04E-04***	***1.91E-04***	***1.64E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	7.84E-05	5.35E-05	3.75E-05	2.89E-05	2.50E-05	5.53E-05	1.26E-04	2.34E-04	3.60E-04	3.34E-04	2.91E-04	2.74E-04	1.78E-04	1.67E-04	1.77E-04	1.90E-04	1.98E-04	2.23E-04	2.45E-04	2.26E-04	1.69E-04	1.36E-04	1.27E-04	1.09E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	3.92E-05	2.67E-05	1.87E-05	1.45E-05	1.25E-05	2.76E-05	6.31E-05	1.17E-04	1.80E-04	1.67E-04	1.45E-04	1.37E-04	8.90E-05	8.35E-05	8.86E-05	9.48E-05	9.89E-05	1.11E-04	1.22E-04	1.13E-04	8.46E-05	6.81E-05	6.35E-05	5.45E-05
	Emission in each Box of 1st jet	g/s	7.84E-06	5.35E-06	3.75E-06	2.89E-06	2.50E-06	5.53E-06	1.26E-05	2.34E-05	3.60E-05	3.34E-05	2.91E-05	2.74E-05	1.78E-05	1.67E-05	1.77E-05	1.90E-05	1.98E-05	2.23E-05	2.45E-05	2.26E-05	1.69E-05	1.36E-05	1.27E-05	1.09E-05
	Emission in each Box of 2nd jet	g/s	3.92E-06	2.67E-06	1.87E-06	1.45E-06	1.25E-06	2.76E-06	6.31E-06	1.17E-05	1.80E-05	1.67E-05	1.45E-05	1.37E-05	8.90E-06	8.35E-06	8.86E-06	9.48E-06	9.89E-06	1.11E-05	1.22E-05	1.13E-05	8.46E-06	6.81E-06	6.35E-06	5.45E-06
FSP Emission Rate		g/s	***1.08E-04***	***7.38E-05***	***5.18E-05***	***4.00E-05***	***3.42E-05***	***7.63E-05***	***1.74E-04***	***3.22E-04***	***4.97E-04***	***4.61E-04***	***4.02E-04***	***3.79E-04***	***2.46E-04***	***2.29E-04***	***2.45E-04***	***2.63E-04***	***2.74E-04***	***3.07E-04***	***3.38E-04***	***3.13E-04***	***2.34E-04***	***1.88E-04***	***1.74E-04***	***1.51E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	7.22E-05	4.92E-05	3.45E-05	2.66E-05	2.28E-05	5.09E-05	1.16E-04	2.14E-04	3.31E-04	3.07E-04	2.68E-04	2.53E-04	1.64E-04	1.53E-04	1.64E-04	1.75E-04	1.83E-04	2.04E-04	2.25E-04	2.09E-04	1.56E-04	1.25E-04	1.16E-04	1.01E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	3.61E-05	2.46E-05	1.73E-05	1.33E-05	1.14E-05	2.54E-05	5.80E-05	1.07E-04	1.66E-04	1.54E-04	1.34E-04	1.26E-04	8.21E-05	7.64E-05	8.18E-05	8.75E-05	9.14E-05	1.02E-04	1.13E-04	1.04E-04	7.81E-05	6.27E-05	5.81E-05	5.03E-05
	Emission in each Box of 1st jet	g/s	7.22E-06	4.92E-06	3.45E-06	2.66E-06	2.28E-06	5.09E-06	1.16E-05	2.14E-05	3.31E-05	3.07E-05	2.68E-05	2.53E-05	1.64E-05	1.53E-05	1.64E-05	1.75E-05	1.83E-05	2.04E-05	2.25E-05	2.09E-05	1.56E-05	1.25E-05	1.16E-05	1.01E-05
	Emission in each Box of 2nd jet	g/s	3.61E-06	2.46E-06	1.73E-06	1.33E-06	1.14E-06	2.54E-06	5.80E-06	1.07E-05	1.66E-05	1.54E-05	1.34E-05	1.26E-05	8.21E-06	7.64E-06	8.18E-06	8.75E-06	9.14E-06	1.02E-05	1.13E-05	1.04E-05	7.81E-06	6.27E-06	5.81E-06	5.03E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1329	0.1129	0.1152	0.1202	0.1230	0.2301	0.2461	0.1862	0.2212	0.2091	0.1897	0.1835	0.1490	0.1449	0.1474	0.1536	0.1577	0.1670	0.1778	0.1688	0.1430	0.1322	0.1310	0.1279
	NO2	g/vehicle/km	0.0221	0.0212	0.0215	0.0220	0.0222	0.0280	0.0288	0.0271	0.0398	0.0375	0.0338	0.0322	0.0297	0.0284	0.0294	0.0308	0.0315	0.0336	0.0361	0.0343	0.0281	0.0248	0.0243	0.0239
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0004***	***0.0009***	***0.0020***	***0.0038***	***0.0067***	***0.0062***	***0.0051***	***0.0048***	***0.0026***	***0.0024***	***0.0026***	***0.0028***	***0.0030***	***0.0034***	***0.0038***	***0.0035***	***0.0024***	***0.0018***	***0.0017***	***0.0015***
	2/3 of NO emission rate in 1st 50m Box	g/s	8.07E-04	5.62E-04	3.91E-04	3.04E-04	2.59E-04	5.81E-04	1.33E-03	2.52E-03	4.47E-03	4.10E-03	3.43E-03	3.18E-03	1.75E-03	1.59E-03	1.71E-03	1.87E-03	1.99E-03	2.26E-03	2.55E-03	2.32E-03	1.62E-03	1.23E-03	1.14E-03	9.73E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	4.04E-04	2.81E-04	1.96E-04	1.52E-04	1.29E-04	2.90E-04	6.65E-04	1.26E-03	2.23E-03	2.05E-03	1.72E-03	1.59E-03	8.73E-04	7.95E-04	8.57E-04	9.37E-04	9.93E-04	1.13E-03	1.27E-03	1.16E-03	8.09E-04	6.16E-04	5.69E-04	4.87E-04
	Emission in each Box of 1st jet	g/s	8.07E-05	5.62E-05	3.91E-05	3.04E-05	2.59E-05	5.81E-05	1.33E-04	2.52E-04	4.47E-04	4.10E-04	3.43E-04	3.18E-04	1.75E-04	1.59E-04	1.71E-04	1.87E-04	1.99E-04	2.26E-04	2.55E-04	2.32E-04	1.62E-04	1.23E-04	1.14E-04	9.73E-05
	Emission in each Box of 2nd jet	g/s	4.04E-05	2.81E-05	1.96E-05	1.52E-05	1.29E-05	2.90E-05	6.65E-05	1.26E-04	2.23E-04	2.05E-04	1.72E-04	1.59E-04	8.73E-05	7.95E-05	8.57E-05	9.37E-05	9.93E-05	1.13E-04	1.27E-04	1.16E-04	8.09E-05	6.16E-05	5.69E-05	4.87E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0008***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.35E-04	1.06E-04	7.31E-05	5.57E-05	4.68E-05	7.07E-05	1.55E-04	3.66E-04	8.03E-04	7.37E-04	6.11E-04	5.59E-04	3.48E-04	3.12E-04	3.41E-04	3.76E-04	3.96E-04	4.55E-04	5.18E-04	4.70E-04	3.18E-04	2.32E-04	2.11E-04	1.81E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.73E-05	5.28E-05	3.65E-05	2.78E-05	2.34E-05	3.53E-05	7.77E-05	1.83E-04	4.02E-04	3.68E-04	3.06E-04	2.80E-04	1.74E-04	1.56E-04	1.71E-04	1.88E-04	1.98E-04	2.27E-04	2.59E-04	2.35E-04	1.59E-04	1.16E-04	1.06E-04	9.07E-05
	Emission in each Box of 1st jet	g/s	1.35E-05	1.06E-05	7.31E-06	5.57E-06	4.68E-06	7.07E-06	1.55E-05	3.66E-05	8.03E-05	7.37E-05	6.11E-05	5.59E-05	3.48E-05	3.12E-05	3.41E-05	3.76E-05	3.96E-05	4.55E-05	5.18E-05	4.70E-05	3.18E-05	2.32E-05	2.11E-05	1.81E-05
	Emission in each Box of 2nd jet	g/s	6.73E-06	5.28E-06	3.65E-06	2.78E-06	2.34E-06	3.53E-06	7.77E-06	1.83E-05	4.02E-05	3.68E-05	3.06E-05	2.80E-05	1.74E-05	1.56E-05	1.71E-05	1.88E-05	1.98E-05	2.27E-05	2.59E-05	2.35E-05	1.59E-05	1.16E-05	1.06E-05	9.07E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1237	0.1039	0.1057	0.1118	0.1143	0.2147	0.2275	0.1736	0.2043	0.1905	0.1742	0.1685	0.1368	0.1340	0.1375	0.1420	0.1455	0.1549	0.1647	0.1577	0.1334	0.1236	0.1209	0.1180
	NO2	g/vehicle/km	0.0208	0.0198	0.0200	0.0207	0.0209	0.0263	0.0268	0.0255	0.0371	0.0347	0.0313	0.0299	0.0275	0.0265	0.0277	0.0287	0.0294	0.0315	0.0339	0.0323	0.0265	0.0234	0.0227	0.0223
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0005***	***0.0004***	***0.0004***	***0.0008***	***0.0018***	***0.0035***	***0.0062***	***0.0056***	***0.0047***	***0.0044***	***0.0024***	***0.0022***	***0.0024***	***0.0026***	***0.0027***	***0.0031***	***0.0035***	***0.0032***	***0.0023***	***0.0017***	***0.0016***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.52E-04	5.17E-04	3.59E-04	2.82E-04	2.40E-04	5.42E-04	1.23E-03	2.35E-03	4.13E-03	3.74E-03	3.15E-03	2.92E-03	1.60E-03	1.47E-03	1.60E-03	1.73E-03	1.83E-03	2.10E-03	2.36E-03	2.16E-03	1.51E-03	1.15E-03	1.05E-03	8.97E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.76E-04	2.59E-04	1.80E-04	1.41E-04	1.20E-04	2.71E-04	6.15E-04	1.17E-03	2.06E-03	1.87E-03	1.58E-03	1.46E-03	8.01E-04	7.35E-04	8.00E-04	8.67E-04	9.16E-04	1.05E-03	1.18E-03	1.08E-03	7.54E-04	5.76E-04	5.25E-04	4.49E-04
	Emission in each Box of 1st jet	g/s	7.52E-05	5.17E-05	3.59E-05	2.82E-05	2.40E-05	5.42E-05	1.23E-04	2.35E-04	4.13E-04	3.74E-04	3.15E-04	2.92E-04	1.60E-04	1.47E-04	1.60E-04	1.73E-04	1.83E-04	2.10E-04	2.36E-04	2.16E-04	1.51E-04	1.15E-04	1.05E-04	8.97E-05
	Emission in each Box of 2nd jet	g/s	3.76E-05	2.59E-05	1.80E-05	1.41E-05	1.20E-05	2.71E-05	6.15E-05	1.17E-04	2.06E-04	1.87E-04	1.58E-04	1.46E-04	8.01E-05	7.35E-05	8.00E-05	8.67E-05	9.16E-05	1.05E-04	1.18E-04	1.08E-04	7.54E-05	5.76E-05	5.25E-05	4.49E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0007***	***0.0004***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.26E-04	9.88E-05	6.81E-05	5.24E-05	4.40E-05	6.64E-05	1.45E-04	3.45E-04	7.49E-04	6.81E-04	5.66E-04	5.19E-04	3.22E-04	2.91E-04	3.22E-04	3.50E-04	3.70E-04	4.27E-04	4.85E-04	4.43E-04	2.99E-04	2.19E-04	1.97E-04	1.69E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.32E-05	4.94E-05	3.41E-05	2.62E-05	2.20E-05	3.32E-05	7.25E-05	1.72E-04	3.74E-04	3.40E-04	2.83E-04	2.59E-04	1.61E-04	1.46E-04	1.61E-04	1.75E-04	1.85E-04	2.13E-04	2.43E-04	2.21E-04	1.50E-04	1.09E-04	9.87E-05	8.47E-05
	Emission in each Box of 1st jet	g/s	1.26E-05	9.88E-06	6.81E-06	5.24E-06	4.40E-06	6.64E-06	1.45E-05	3.45E-05	7.49E-05	6.81E-05	5.66E-05	5.19E-05	3.22E-05	2.91E-05	3.22E-05	3.50E-05	3.70E-05	4.27E-05	4.85E-05	4.43E-05	2.99E-05	2.19E-05	1.97E-05	1.69E-05
	Emission in each Box of 2nd jet	g/s	6.32E-06	4.94E-06	3.41E-06	2.62E-06	2.20E-06	3.32E-06	7.25E-06	1.72E-05	3.74E-05	3.40E-05	2.83E-05	2.59E-05	1.61E-05	1.46E-05	1.61E-05	1.75E-05	1.85E-05	2.13E-05	2.43E-05	2.21E-05	1.50E-05	1.09E-05	9.87E-06	8.47E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1164	0.0977	0.0997	0.1038	0.1061	0.2007	0.2132	0.1628	0.1922	0.1811	0.1636	0.1605	0.1303	0.1256	0.1289	0.1348	0.1367	0.1462	0.1565	0.1484	0.1250	0.1157	0.1132	0.1107
	NO2	g/vehicle/km	0.0197	0.0188	0.0191	0.0195	0.0197	0.0248	0.0253	0.0241	0.0351	0.0331	0.0296	0.0286	0.0263	0.0250	0.0261	0.0273	0.0277	0.0299	0.0323	0.0306	0.0250	0.0221	0.0214	0.0210
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0008***	***0.0017***	***0.0033***	***0.0058***	***0.0053***	***0.0044***	***0.0042***	***0.0023***	***0.0021***	***0.0022***	***0.0025***	***0.0026***	***0.0030***	***0.0034***	***0.0031***	***0.0021***	***0.0016***	***0.0015***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.07E-04	4.87E-04	3.39E-04	2.62E-04	2.23E-04	5.07E-04	1.15E-03	2.20E-03	3.88E-03	3.55E-03	2.96E-03	2.78E-03	1.53E-03	1.38E-03	1.50E-03	1.65E-03	1.72E-03	1.98E-03	2.24E-03	2.04E-03	1.41E-03	1.08E-03	9.83E-04	8.42E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.54E-04	2.43E-04	1.69E-04	1.31E-04	1.12E-04	2.53E-04	5.76E-04	1.10E-03	1.94E-03	1.78E-03	1.48E-03	1.39E-03	7.63E-04	6.89E-04	7.50E-04	8.23E-04	8.60E-04	9.91E-04	1.12E-03	1.02E-03	7.07E-04	5.40E-04	4.91E-04	4.21E-04
	Emission in each Box of 1st jet	g/s	7.07E-05	4.87E-05	3.39E-05	2.62E-05	2.23E-05	5.07E-05	1.15E-04	2.20E-04	3.88E-04	3.55E-04	2.96E-04	2.78E-04	1.53E-04	1.38E-04	1.50E-04	1.65E-04	1.72E-04	1.98E-04	2.24E-04	2.04E-04	1.41E-04	1.08E-04	9.83E-05	8.42E-05
	Emission in each Box of 2nd jet	g/s	3.54E-05	2.43E-05	1.69E-05	1.31E-05	1.12E-05	2.53E-05	5.76E-05	1.10E-04	1.94E-04	1.78E-04	1.48E-04	1.39E-04	7.63E-05	6.89E-05	7.50E-05	8.23E-05	8.60E-05	9.91E-05	1.12E-04	1.02E-04	7.07E-05	5.40E-05	4.91E-05	4.21E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0007***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.20E-04	9.38E-05	6.48E-05	4.93E-05	4.13E-05	6.25E-05	1.37E-04	3.26E-04	7.09E-04	6.49E-04	5.35E-04	4.96E-04	3.08E-04	2.75E-04	3.03E-04	3.34E-04	3.49E-04	4.05E-04	4.63E-04	4.20E-04	2.82E-04	2.06E-04	1.86E-04	1.60E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.99E-05	4.69E-05	3.24E-05	2.46E-05	2.07E-05	3.13E-05	6.83E-05	1.63E-04	3.54E-04	3.24E-04	2.68E-04	2.48E-04	1.54E-04	1.37E-04	1.52E-04	1.67E-04	1.74E-04	2.03E-04	2.32E-04	2.10E-04	1.41E-04	1.03E-04	9.30E-05	8.00E-05
	Emission in each Box of 1st jet	g/s	1.20E-05	9.38E-06	6.48E-06	4.93E-06	4.13E-06	6.25E-06	1.37E-05	3.26E-05	7.09E-05	6.49E-05	5.35E-05	4.96E-05	3.08E-05	2.75E-05	3.03E-05	3.34E-05	3.49E-05	4.05E-05	4.63E-05	4.20E-05	2.82E-05	2.06E-05	1.86E-05	1.60E-05
	Emission in each Box of 2nd jet	g/s	5.99E-06	4.69E-06	3.24E-06	2.46E-06	2.07E-06	3.13E-06	6.83E-06	1.63E-05	3.54E-05	3.24E-05	2.68E-05	2.48E-05	1.54E-05	1.37E-05	1.52E-05	1.67E-05	1.74E-05	2.03E-05	2.32E-05	2.10E-05	1.41E-05	1.03E-05	9.30E-06	8.00E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1090	0.0914	0.0927	0.0991	0.1013	0.1929	0.2050	0.1549	0.1828	0.1724	0.1556	0.1524	0.1236	0.1212	0.1245	0.1278	0.1323	0.1389	0.1488	0.1403	0.1184	0.1114	0.1085	0.1057
	NO2	g/vehicle/km	0.0186	0.0178	0.0180	0.0188	0.0189	0.0239	0.0244	0.0230	0.0336	0.0316	0.0282	0.0272	0.0251	0.0243	0.0252	0.0260	0.0269	0.0285	0.0308	0.0291	0.0237	0.0214	0.0206	0.0202
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0017***	***0.0031***	***0.0055***	***0.0051***	***0.0042***	***0.0040***	***0.0022***	***0.0020***	***0.0022***	***0.0023***	***0.0025***	***0.0028***	***0.0032***	***0.0029***	***0.0020***	***0.0016***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.62E-04	4.55E-04	3.15E-04	2.50E-04	2.13E-04	4.87E-04	1.11E-03	2.09E-03	3.69E-03	3.38E-03	2.82E-03	2.64E-03	1.45E-03	1.33E-03	1.45E-03	1.56E-03	1.67E-03	1.88E-03	2.13E-03	1.92E-03	1.34E-03	1.04E-03	9.42E-04	8.04E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.31E-04	2.28E-04	1.58E-04	1.25E-04	1.07E-04	2.44E-04	5.54E-04	1.05E-03	1.85E-03	1.69E-03	1.41E-03	1.32E-03	7.24E-04	6.65E-04	7.24E-04	7.80E-04	8.33E-04	9.41E-04	1.07E-03	9.62E-04	6.70E-04	5.20E-04	4.71E-04	4.02E-04
	Emission in each Box of 1st jet	g/s	6.62E-05	4.55E-05	3.15E-05	2.50E-05	2.13E-05	4.87E-05	1.11E-04	2.09E-04	3.69E-04	3.38E-04	2.82E-04	2.64E-04	1.45E-04	1.33E-04	1.45E-04	1.56E-04	1.67E-04	1.88E-04	2.13E-04	1.92E-04	1.34E-04	1.04E-04	9.42E-05	8.04E-05
	Emission in each Box of 2nd jet	g/s	3.31E-05	2.28E-05	1.58E-05	1.25E-05	1.07E-05	2.44E-05	5.54E-05	1.05E-04	1.85E-04	1.69E-04	1.41E-04	1.32E-04	7.24E-05	6.65E-05	7.24E-05	7.80E-05	8.33E-05	9.41E-05	1.07E-04	9.62E-05	6.70E-05	5.20E-05	4.71E-05	4.02E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0010***	***0.0009***	***0.0008***	***0.0007***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.13E-04	8.86E-05	6.10E-05	4.74E-05	3.98E-05	6.03E-05	1.32E-04	3.11E-04	6.78E-04	6.21E-04	5.10E-04	4.72E-04	2.94E-04	2.66E-04	2.93E-04	3.18E-04	3.39E-04	3.86E-04	4.42E-04	3.99E-04	2.68E-04	1.99E-04	1.79E-04	1.54E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.66E-05	4.43E-05	3.05E-05	2.37E-05	1.99E-05	3.01E-05	6.59E-05	1.55E-04	3.39E-04	3.10E-04	2.55E-04	2.36E-04	1.47E-04	1.33E-04	1.47E-04	1.59E-04	1.69E-04	1.93E-04	2.21E-04	2.00E-04	1.34E-04	9.97E-05	8.96E-05	7.68E-05
	Emission in each Box of 1st jet	g/s	1.13E-05	8.86E-06	6.10E-06	4.74E-06	3.98E-06	6.03E-06	1.32E-05	3.11E-05	6.78E-05	6.21E-05	5.10E-05	4.72E-05	2.94E-05	2.66E-05	2.93E-05	3.18E-05	3.39E-05	3.86E-05	4.42E-05	3.99E-05	2.68E-05	1.99E-05	1.79E-05	1.54E-05
	Emission in each Box of 2nd jet	g/s	5.66E-06	4.43E-06	3.05E-06	2.37E-06	1.99E-06	3.01E-06	6.59E-06	1.55E-05	3.39E-05	3.10E-05	2.55E-05	2.36E-05	1.47E-05	1.33E-05	1.47E-05	1.59E-05	1.69E-05	1.93E-05	2.21E-05	2.00E-05	1.34E-05	9.97E-06	8.96E-06	7.68E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0977	0.0811	0.0827	0.0859	0.0879	0.1680	0.1763	0.1341	0.1606	0.1506	0.1384	0.1352	0.1105	0.1078	0.1115	0.1140	0.1175	0.1252	0.1307	0.1256	0.1056	0.0966	0.0948	0.0922
	NO2	g/vehicle/km	0.0168	0.0160	0.0162	0.0165	0.0167	0.0210	0.0212	0.0201	0.0297	0.0279	0.0252	0.0243	0.0225	0.0217	0.0227	0.0234	0.0241	0.0259	0.0273	0.0262	0.0214	0.0188	0.0182	0.0178
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0006***	***0.0014***	***0.0027***	***0.0049***	***0.0044***	***0.0038***	***0.0035***	***0.0019***	***0.0018***	***0.0019***	***0.0021***	***0.0022***	***0.0025***	***0.0028***	***0.0026***	***0.0018***	***0.0014***	***0.0012***	***0.0011***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.94E-04	4.04E-04	2.81E-04	2.17E-04	1.85E-04	4.24E-04	9.53E-04	1.81E-03	3.24E-03	2.96E-03	2.50E-03	2.34E-03	1.29E-03	1.18E-03	1.30E-03	1.39E-03	1.48E-03	1.70E-03	1.87E-03	1.72E-03	1.19E-03	9.01E-04	8.23E-04	7.01E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.97E-04	2.02E-04	1.41E-04	1.08E-04	9.24E-05	2.12E-04	4.76E-04	9.06E-04	1.62E-03	1.48E-03	1.25E-03	1.17E-03	6.47E-04	5.91E-04	6.48E-04	6.95E-04	7.40E-04	8.48E-04	9.36E-04	8.61E-04	5.97E-04	4.50E-04	4.11E-04	3.51E-04
	Emission in each Box of 1st jet	g/s	5.94E-05	4.04E-05	2.81E-05	2.17E-05	1.85E-05	4.24E-05	9.53E-05	1.81E-04	3.24E-04	2.96E-04	2.50E-04	2.34E-04	1.29E-04	1.18E-04	1.30E-04	1.39E-04	1.48E-04	1.70E-04	1.87E-04	1.72E-04	1.19E-04	9.01E-05	8.23E-05	7.01E-05
	Emission in each Box of 2nd jet	g/s	2.97E-05	2.02E-05	1.41E-05	1.08E-05	9.24E-06	2.12E-05	4.76E-05	9.06E-05	1.62E-04	1.48E-04	1.25E-04	1.17E-04	6.47E-05	5.91E-05	6.48E-05	6.95E-05	7.40E-05	8.48E-05	9.36E-05	8.61E-05	5.97E-05	4.50E-05	4.11E-05	3.51E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.02E-04	7.97E-05	5.51E-05	4.17E-05	3.51E-05	5.30E-05	1.15E-04	2.71E-04	6.00E-04	5.47E-04	4.56E-04	4.21E-04	2.64E-04	2.38E-04	2.64E-04	2.85E-04	3.03E-04	3.50E-04	3.91E-04	3.60E-04	2.42E-04	1.75E-04	1.58E-04	1.35E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.11E-05	3.99E-05	2.75E-05	2.09E-05	1.75E-05	2.65E-05	5.73E-05	1.36E-04	3.00E-04	2.73E-04	2.28E-04	2.11E-04	1.32E-04	1.19E-04	1.32E-04	1.43E-04	1.51E-04	1.75E-04	1.96E-04	1.80E-04	1.21E-04	8.74E-05	7.92E-05	6.77E-05
	Emission in each Box of 1st jet	g/s	1.02E-05	7.97E-06	5.51E-06	4.17E-06	3.51E-06	5.30E-06	1.15E-05	2.71E-05	6.00E-05	5.47E-05	4.56E-05	4.21E-05	2.64E-05	2.38E-05	2.64E-05	2.85E-05	3.03E-05	3.50E-05	3.91E-05	3.60E-05	2.42E-05	1.75E-05	1.58E-05	1.35E-05
	Emission in each Box of 2nd jet	g/s	5.11E-06	3.99E-06	2.75E-06	2.09E-06	1.75E-06	2.65E-06	5.73E-06	1.36E-05	3.00E-05	2.73E-05	2.28E-05	2.11E-05	1.32E-05	1.19E-05	1.32E-05	1.43E-05	1.51E-05	1.75E-05	1.96E-05	1.80E-05	1.21E-05	8.74E-06	7.92E-06	6.77E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0941	0.0786	0.0822	0.0854	0.0869	0.1661	0.1722	0.1324	0.1569	0.1502	0.1338	0.1306	0.1060	0.1042	0.1062	0.1101	0.1155	0.1221	0.1283	0.1241	0.1044	0.0960	0.0936	0.0916
	NO2	g/vehicle/km	0.0163	0.0155	0.0161	0.0165	0.0165	0.0208	0.0207	0.0199	0.0291	0.0278	0.0245	0.0236	0.0217	0.0211	0.0218	0.0227	0.0237	0.0253	0.0269	0.0260	0.0212	0.0187	0.0180	0.0177
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0006***	***0.0014***	***0.0027***	***0.0048***	***0.0044***	***0.0036***	***0.0034***	***0.0019***	***0.0017***	***0.0019***	***0.0020***	***0.0022***	***0.0025***	***0.0028***	***0.0026***	***0.0018***	***0.0013***	***0.0012***	***0.0010***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.72E-04	3.92E-04	2.80E-04	2.16E-04	1.83E-04	4.19E-04	9.30E-04	1.79E-03	3.17E-03	2.95E-03	2.42E-03	2.26E-03	1.24E-03	1.14E-03	1.24E-03	1.34E-03	1.45E-03	1.65E-03	1.84E-03	1.70E-03	1.18E-03	8.95E-04	8.13E-04	6.97E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.86E-04	1.96E-04	1.40E-04	1.08E-04	9.14E-05	2.10E-04	4.65E-04	8.95E-04	1.58E-03	1.47E-03	1.21E-03	1.13E-03	6.21E-04	5.71E-04	6.18E-04	6.72E-04	7.27E-04	8.27E-04	9.18E-04	8.51E-04	5.90E-04	4.47E-04	4.07E-04	3.48E-04
	Emission in each Box of 1st jet	g/s	5.72E-05	3.92E-05	2.80E-05	2.16E-05	1.83E-05	4.19E-05	9.30E-05	1.79E-04	3.17E-04	2.95E-04	2.42E-04	2.26E-04	1.24E-04	1.14E-04	1.24E-04	1.34E-04	1.45E-04	1.65E-04	1.84E-04	1.70E-04	1.18E-04	8.95E-05	8.13E-05	6.97E-05
	Emission in each Box of 2nd jet	g/s	2.86E-05	1.96E-05	1.40E-05	1.08E-05	9.14E-06	2.10E-05	4.65E-05	8.95E-05	1.58E-04	1.47E-04	1.21E-04	1.13E-04	6.21E-05	5.71E-05	6.18E-05	6.72E-05	7.27E-05	8.27E-05	9.18E-05	8.51E-05	5.90E-05	4.47E-05	4.07E-05	3.48E-05
NO_2 Emission Rate		g/s	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.90E-05	7.75E-05	5.48E-05	4.16E-05	3.47E-05	5.25E-05	1.12E-04	2.68E-04	5.89E-04	5.46E-04	4.43E-04	4.09E-04	2.55E-04	2.31E-04	2.53E-04	2.77E-04	2.99E-04	3.43E-04	3.85E-04	3.56E-04	2.40E-04	1.74E-04	1.57E-04	1.35E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.95E-05	3.87E-05	2.74E-05	2.08E-05	1.73E-05	2.62E-05	5.60E-05	1.34E-04	2.94E-04	2.73E-04	2.22E-04	2.05E-04	1.27E-04	1.16E-04	1.27E-04	1.38E-04	1.49E-04	1.71E-04	1.93E-04	1.78E-04	1.20E-04	8.70E-05	7.83E-05	6.74E-05
	Emission in each Box of 1st jet	g/s	9.90E-06	7.75E-06	5.48E-06	4.16E-06	3.47E-06	5.25E-06	1.12E-05	2.68E-05	5.89E-05	5.46E-05	4.43E-05	4.09E-05	2.55E-05	2.31E-05	2.53E-05	2.77E-05	2.99E-05	3.43E-05	3.85E-05	3.56E-05	2.40E-05	1.74E-05	1.57E-05	1.35E-05
	Emission in each Box of 2nd jet	g/s	4.95E-06	3.87E-06	2.74E-06	2.08E-06	1.73E-06	2.62E-06	5.60E-06	1.34E-05	2.94E-05	2.73E-05	2.22E-05	2.05E-05	1.27E-05	1.16E-05	1.27E-05	1.38E-05	1.49E-05	1.71E-05	1.93E-05	1.78E-05	1.20E-05	8.70E-06	7.83E-06	6.74E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0948	0.0781	0.0796	0.0826	0.0845	0.1608	0.1722	0.1290	0.1531	0.1452	0.1344	0.1323	0.1040	0.1023	0.1075	0.1107	0.1134	0.1218	0.1268	0.1227	0.1025	0.0948	0.0924	0.0892
	NO2	g/vehicle/km	0.0164	0.0155	0.0157	0.0160	0.0161	0.0202	0.0207	0.0194	0.0284	0.0269	0.0246	0.0239	0.0214	0.0207	0.0220	0.0228	0.0233	0.0252	0.0266	0.0257	0.0208	0.0184	0.0178	0.0173
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0006***	***0.0014***	***0.0026***	***0.0046***	***0.0043***	***0.0036***	***0.0034***	***0.0018***	***0.0017***	***0.0019***	***0.0020***	***0.0021***	***0.0025***	***0.0027***	***0.0025***	***0.0017***	***0.0013***	***0.0012***	***0.0010***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.76E-04	3.89E-04	2.71E-04	2.09E-04	1.78E-04	4.06E-04	9.30E-04	1.74E-03	3.09E-03	2.85E-03	2.43E-03	2.29E-03	1.22E-03	1.12E-03	1.25E-03	1.35E-03	1.43E-03	1.65E-03	1.82E-03	1.68E-03	1.16E-03	8.84E-04	8.03E-04	6.78E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.88E-04	1.95E-04	1.35E-04	1.04E-04	8.89E-05	2.03E-04	4.65E-04	8.72E-04	1.55E-03	1.43E-03	1.22E-03	1.15E-03	6.09E-04	5.61E-04	6.25E-04	6.75E-04	7.14E-04	8.25E-04	9.08E-04	8.41E-04	5.80E-04	4.42E-04	4.01E-04	3.39E-04
	Emission in each Box of 1st jet	g/s	5.76E-05	3.89E-05	2.71E-05	2.09E-05	1.78E-05	4.06E-05	9.30E-05	1.74E-04	3.09E-04	2.85E-04	2.43E-04	2.29E-04	1.22E-04	1.12E-04	1.25E-04	1.35E-04	1.43E-04	1.65E-04	1.82E-04	1.68E-04	1.16E-04	8.84E-05	8.03E-05	6.78E-05
	Emission in each Box of 2nd jet	g/s	2.88E-05	1.95E-05	1.35E-05	1.04E-05	8.89E-06	2.03E-05	4.65E-05	8.72E-05	1.55E-04	1.43E-04	1.22E-04	1.15E-04	6.09E-05	5.61E-05	6.25E-05	6.75E-05	7.14E-05	8.25E-05	9.08E-05	8.41E-05	5.80E-05	4.42E-05	4.01E-05	3.39E-05
NO_2 Emission Rate		g/s	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.96E-05	7.71E-05	5.33E-05	4.03E-05	3.39E-05	5.10E-05	1.12E-04	2.62E-04	5.74E-04	5.28E-04	4.45E-04	4.14E-04	2.50E-04	2.27E-04	2.56E-04	2.78E-04	2.93E-04	3.41E-04	3.81E-04	3.52E-04	2.35E-04	1.72E-04	1.55E-04	1.32E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.98E-05	3.85E-05	2.66E-05	2.02E-05	1.69E-05	2.55E-05	5.60E-05	1.31E-04	2.87E-04	2.64E-04	2.22E-04	2.07E-04	1.25E-04	1.14E-04	1.28E-04	1.39E-04	1.47E-04	1.71E-04	1.90E-04	1.76E-04	1.18E-04	8.60E-05	7.74E-05	6.58E-05
	Emission in each Box of 1st jet	g/s	9.96E-06	7.71E-06	5.33E-06	4.03E-06	3.39E-06	5.10E-06	1.12E-05	2.62E-05	5.74E-05	5.28E-05	4.45E-05	4.14E-05	2.50E-05	2.27E-05	2.56E-05	2.78E-05	2.93E-05	3.41E-05	3.81E-05	3.52E-05	2.35E-05	1.72E-05	1.55E-05	1.32E-05
	Emission in each Box of 2nd jet	g/s	4.98E-06	3.85E-06	2.66E-06	2.02E-06	1.69E-06	2.55E-06	5.60E-06	1.31E-05	2.87E-05	2.64E-05	2.22E-05	2.07E-05	1.25E-05	1.14E-05	1.28E-05	1.39E-05	1.47E-05	1.71E-05	1.90E-05	1.76E-05	1.18E-05	8.60E-06	7.74E-06	6.58E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0960	0.0797	0.0813	0.0844	0.0863	0.1642	0.1757	0.1324	0.1550	0.1457	0.1365	0.1324	0.1060	0.1042	0.1069	0.1101	0.1162	0.1213	0.1306	0.1226	0.1026	0.0948	0.0925	0.0904
	NO2	g/vehicle/km	0.0166	0.0158	0.0160	0.0163	0.0164	0.0206	0.0211	0.0199	0.0287	0.0270	0.0250	0.0239	0.0217	0.0211	0.0219	0.0227	0.0239	0.0251	0.0273	0.0257	0.0208	0.0185	0.0178	0.0175
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0006***	***0.0014***	***0.0027***	***0.0047***	***0.0043***	***0.0037***	***0.0034***	***0.0019***	***0.0017***	***0.0019***	***0.0020***	***0.0022***	***0.0025***	***0.0028***	***0.0025***	***0.0017***	***0.0013***	***0.0012***	***0.0010***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.83E-04	3.97E-04	2.76E-04	2.13E-04	1.82E-04	4.15E-04	9.49E-04	1.79E-03	3.13E-03	2.86E-03	2.47E-03	2.30E-03	1.24E-03	1.14E-03	1.24E-03	1.34E-03	1.46E-03	1.64E-03	1.87E-03	1.68E-03	1.16E-03	8.84E-04	8.03E-04	6.88E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.92E-04	1.99E-04	1.38E-04	1.07E-04	9.08E-05	2.07E-04	4.75E-04	8.95E-04	1.56E-03	1.43E-03	1.24E-03	1.15E-03	6.21E-04	5.71E-04	6.22E-04	6.72E-04	7.32E-04	8.22E-04	9.35E-04	8.41E-04	5.80E-04	4.42E-04	4.01E-04	3.44E-04
	Emission in each Box of 1st jet	g/s	5.83E-05	3.97E-05	2.76E-05	2.13E-05	1.82E-05	4.15E-05	9.49E-05	1.79E-04	3.13E-04	2.86E-04	2.47E-04	2.30E-04	1.24E-04	1.14E-04	1.24E-04	1.34E-04	1.46E-04	1.64E-04	1.87E-04	1.68E-04	1.16E-04	8.84E-05	8.03E-05	6.88E-05
	Emission in each Box of 2nd jet	g/s	2.92E-05	1.99E-05	1.38E-05	1.07E-05	9.08E-06	2.07E-05	4.75E-05	8.95E-05	1.56E-04	1.43E-04	1.24E-04	1.15E-04	6.21E-05	5.71E-05	6.22E-05	6.72E-05	7.32E-05	8.22E-05	9.35E-05	8.41E-05	5.80E-05	4.42E-05	4.01E-05	3.44E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.01E-04	7.85E-05	5.42E-05	4.11E-05	3.45E-05	5.19E-05	1.14E-04	2.68E-04	5.81E-04	5.30E-04	4.52E-04	4.14E-04	2.55E-04	2.31E-04	2.55E-04	2.77E-04	3.00E-04	3.41E-04	3.91E-04	3.52E-04	2.35E-04	1.72E-04	1.55E-04	1.33E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.04E-05	3.92E-05	2.71E-05	2.06E-05	1.73E-05	2.60E-05	5.71E-05	1.34E-04	2.90E-04	2.65E-04	2.26E-04	2.07E-04	1.27E-04	1.16E-04	1.27E-04	1.38E-04	1.50E-04	1.70E-04	1.96E-04	1.76E-04	1.18E-04	8.61E-05	7.74E-05	6.66E-05
	Emission in each Box of 1st jet	g/s	1.01E-05	7.85E-06	5.42E-06	4.11E-06	3.45E-06	5.19E-06	1.14E-05	2.68E-05	5.81E-05	5.30E-05	4.52E-05	4.14E-05	2.55E-05	2.31E-05	2.55E-05	2.77E-05	3.00E-05	3.41E-05	3.91E-05	3.52E-05	2.35E-05	1.72E-05	1.55E-05	1.33E-05
	Emission in each Box of 2nd jet	g/s	5.04E-06	3.92E-06	2.71E-06	2.06E-06	1.73E-06	2.60E-06	5.71E-06	1.34E-05	2.90E-05	2.65E-05	2.26E-05	2.07E-05	1.27E-05	1.16E-05	1.27E-05	1.38E-05	1.50E-05	1.70E-05	1.96E-05	1.76E-05	1.18E-05	8.61E-06	7.74E-06	6.66E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.0953	0.0791	0.0806	0.0832	0.0879	0.1670	0.1776	0.1307	0.1563	0.1474	0.1384	0.1324	0.1074	0.1070	0.1091	0.1131	0.1151	0.1209	0.1299	0.1211	0.1056	0.0972	0.0948	0.0927
	NO2	g/vehicle/km	0.0165	0.0156	0.0158	0.0161	0.0167	0.0209	0.0213	0.0196	0.0290	0.0273	0.0252	0.0238	0.0220	0.0216	0.0223	0.0232	0.0236	0.0250	0.0272	0.0254	0.0214	0.0189	0.0182	0.0179
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0009***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0006***	***0.0014***	***0.0026***	***0.0047***	***0.0043***	***0.0038***	***0.0034***	***0.0019***	***0.0018***	***0.0019***	***0.0021***	***0.0022***	***0.0025***	***0.0028***	***0.0025***	***0.0018***	***0.0014***	***0.0012***	***0.0011***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.79E-04	3.94E-04	2.74E-04	2.10E-04	1.85E-04	4.22E-04	9.60E-04	1.77E-03	3.16E-03	2.89E-03	2.50E-03	2.29E-03	1.26E-03	1.17E-03	1.27E-03	1.38E-03	1.45E-03	1.64E-03	1.86E-03	1.66E-03	1.19E-03	9.06E-04	8.23E-04	7.05E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.90E-04	1.97E-04	1.37E-04	1.05E-04	9.24E-05	2.11E-04	4.80E-04	8.83E-04	1.58E-03	1.45E-03	1.25E-03	1.15E-03	6.29E-04	5.87E-04	6.35E-04	6.90E-04	7.24E-04	8.19E-04	9.30E-04	8.31E-04	5.97E-04	4.53E-04	4.11E-04	3.52E-04
	Emission in each Box of 1st jet	g/s	5.79E-05	3.94E-05	2.74E-05	2.10E-05	1.85E-05	4.22E-05	9.60E-05	1.77E-04	3.16E-04	2.89E-04	2.50E-04	2.29E-04	1.26E-04	1.17E-04	1.27E-04	1.38E-04	1.45E-04	1.64E-04	1.86E-04	1.66E-04	1.19E-04	9.06E-05	8.23E-05	7.05E-05
	Emission in each Box of 2nd jet	g/s	2.90E-05	1.97E-05	1.37E-05	1.05E-05	9.24E-06	2.11E-05	4.80E-05	8.83E-05	1.58E-04	1.45E-04	1.25E-04	1.15E-04	6.29E-05	5.87E-05	6.35E-05	6.90E-05	7.24E-05	8.19E-05	9.30E-05	8.31E-05	5.97E-05	4.53E-05	4.11E-05	3.52E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0004***	***0.0009***	***0.0008***	***0.0007***	***0.0006***	***0.0004***	***0.0004***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0006***	***0.0005***	***0.0004***	***0.0003***	***0.0002***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.00E-04	7.79E-05	5.38E-05	4.06E-05	3.51E-05	5.27E-05	1.15E-04	2.65E-04	5.86E-04	5.36E-04	4.56E-04	4.13E-04	2.57E-04	2.37E-04	2.59E-04	2.83E-04	2.97E-04	3.39E-04	3.89E-04	3.48E-04	2.42E-04	1.76E-04	1.58E-04	1.36E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.00E-05	3.90E-05	2.69E-05	2.03E-05	1.75E-05	2.64E-05	5.77E-05	1.33E-04	2.93E-04	2.68E-04	2.28E-04	2.07E-04	1.29E-04	1.18E-04	1.30E-04	1.42E-04	1.49E-04	1.70E-04	1.95E-04	1.74E-04	1.21E-04	8.80E-05	7.92E-05	6.81E-05
	Emission in each Box of 1st jet	g/s	1.00E-05	7.79E-06	5.38E-06	4.06E-06	3.51E-06	5.27E-06	1.15E-05	2.65E-05	5.86E-05	5.36E-05	4.56E-05	4.13E-05	2.57E-05	2.37E-05	2.59E-05	2.83E-05	2.97E-05	3.39E-05	3.89E-05	3.48E-05	2.42E-05	1.76E-05	1.58E-05	1.36E-05
	Emission in each Box of 2nd jet	g/s	5.00E-06	3.90E-06	2.69E-06	2.03E-06	1.75E-06	2.64E-06	5.77E-06	1.33E-05	2.93E-05	2.68E-05	2.28E-05	2.07E-05	1.29E-05	1.18E-05	1.30E-05	1.42E-05	1.49E-05	1.70E-05	1.95E-05	1.74E-05	1.21E-05	8.80E-06	7.92E-06	6.81E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1080	0.0904	0.0918	0.0955	0.0973	0.1849	0.1974	0.1505	0.1776	0.1674	0.1509	0.1479	0.1207	0.1177	0.1209	0.1247	0.1285	0.1348	0.1459	0.1380	0.1169	0.1082	0.1057	0.1029
	NO2	g/vehicle/km	0.0185	0.0176	0.0178	0.0182	0.0182	0.0230	0.0236	0.0224	0.0327	0.0307	0.0274	0.0265	0.0244	0.0236	0.0245	0.0255	0.0262	0.0277	0.0303	0.0287	0.0235	0.0208	0.0202	0.0197
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0007***	***0.0016***	***0.0031***	***0.0054***	***0.0049***	***0.0041***	***0.0038***	***0.0021***	***0.0019***	***0.0021***	***0.0023***	***0.0024***	***0.0027***	***0.0031***	***0.0028***	***0.0020***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.56E-04	4.51E-04	3.12E-04	2.41E-04	2.05E-04	4.67E-04	1.07E-03	2.03E-03	3.59E-03	3.29E-03	2.73E-03	2.56E-03	1.41E-03	1.29E-03	1.41E-03	1.52E-03	1.62E-03	1.83E-03	2.09E-03	1.89E-03	1.32E-03	1.01E-03	9.18E-04	7.83E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.28E-04	2.25E-04	1.56E-04	1.21E-04	1.02E-04	2.33E-04	5.33E-04	1.02E-03	1.79E-03	1.64E-03	1.37E-03	1.28E-03	7.07E-04	6.46E-04	7.03E-04	7.61E-04	8.09E-04	9.13E-04	1.04E-03	9.46E-04	6.61E-04	5.05E-04	4.59E-04	3.91E-04
	Emission in each Box of 1st jet	g/s	6.56E-05	4.51E-05	3.12E-05	2.41E-05	2.05E-05	4.67E-05	1.07E-04	2.03E-04	3.59E-04	3.29E-04	2.73E-04	2.56E-04	1.41E-04	1.29E-04	1.41E-04	1.52E-04	1.62E-04	1.83E-04	2.09E-04	1.89E-04	1.32E-04	1.01E-04	9.18E-05	7.83E-05
	Emission in each Box of 2nd jet	g/s	3.28E-05	2.25E-05	1.56E-05	1.21E-05	1.02E-05	2.33E-05	5.33E-05	1.02E-04	1.79E-04	1.64E-04	1.37E-04	1.28E-04	7.07E-05	6.46E-05	7.03E-05	7.61E-05	8.09E-05	9.13E-05	1.04E-04	9.46E-05	6.61E-05	5.05E-05	4.59E-05	3.91E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0010***	***0.0009***	***0.0007***	***0.0007***	***0.0004***	***0.0004***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.12E-04	8.79E-05	6.05E-05	4.59E-05	3.83E-05	5.80E-05	1.27E-04	3.03E-04	6.60E-04	6.03E-04	4.96E-04	4.60E-04	2.86E-04	2.59E-04	2.85E-04	3.11E-04	3.30E-04	3.76E-04	4.34E-04	3.93E-04	2.65E-04	1.94E-04	1.75E-04	1.50E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.62E-05	4.40E-05	3.02E-05	2.30E-05	1.91E-05	2.90E-05	6.37E-05	1.51E-04	3.30E-04	3.02E-04	2.48E-04	2.30E-04	1.43E-04	1.29E-04	1.42E-04	1.55E-04	1.65E-04	1.88E-04	2.17E-04	1.97E-04	1.33E-04	9.71E-05	8.76E-05	7.50E-05
	Emission in each Box of 1st jet	g/s	1.12E-05	8.79E-06	6.05E-06	4.59E-06	3.83E-06	5.80E-06	1.27E-05	3.03E-05	6.60E-05	6.03E-05	4.96E-05	4.60E-05	2.86E-05	2.59E-05	2.85E-05	3.11E-05	3.30E-05	3.76E-05	4.34E-05	3.93E-05	2.65E-05	1.94E-05	1.75E-05	1.50E-05
	Emission in each Box of 2nd jet	g/s	5.62E-06	4.40E-06	3.02E-06	2.30E-06	1.91E-06	2.90E-06	6.37E-06	1.51E-05	3.30E-05	3.02E-05	2.48E-05	2.30E-05	1.43E-05	1.29E-05	1.42E-05	1.55E-05	1.65E-05	1.88E-05	2.17E-05	1.97E-05	1.33E-05	9.71E-06	8.76E-06	7.50E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1189	0.1011	0.1028	0.1080	0.1104	0.2091	0.2227	0.1696	0.2006	0.1897	0.1710	0.1666	0.1341	0.1308	0.1343	0.1387	0.1421	0.1518	0.1608	0.1546	0.1303	0.1206	0.1179	0.1154
	NO2	g/vehicle/km	0.0201	0.0194	0.0196	0.0202	0.0203	0.0257	0.0263	0.0250	0.0366	0.0346	0.0308	0.0296	0.0270	0.0260	0.0270	0.0280	0.0288	0.0309	0.0332	0.0318	0.0259	0.0230	0.0223	0.0219
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0005***	***0.0004***	***0.0003***	***0.0008***	***0.0018***	***0.0034***	***0.0061***	***0.0056***	***0.0046***	***0.0043***	***0.0024***	***0.0022***	***0.0023***	***0.0025***	***0.0027***	***0.0031***	***0.0035***	***0.0032***	***0.0022***	***0.0017***	***0.0015***	***0.0013***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.22E-04	5.03E-04	3.49E-04	2.73E-04	2.32E-04	5.28E-04	1.20E-03	2.29E-03	4.05E-03	3.72E-03	3.09E-03	2.89E-03	1.57E-03	1.44E-03	1.56E-03	1.69E-03	1.79E-03	2.06E-03	2.30E-03	2.12E-03	1.47E-03	1.12E-03	1.02E-03	8.78E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.61E-04	2.52E-04	1.75E-04	1.36E-04	1.16E-04	2.64E-04	6.02E-04	1.15E-03	2.03E-03	1.86E-03	1.55E-03	1.44E-03	7.85E-04	7.18E-04	7.81E-04	8.46E-04	8.95E-04	1.03E-03	1.15E-03	1.06E-03	7.37E-04	5.62E-04	5.12E-04	4.39E-04
	Emission in each Box of 1st jet	g/s	7.22E-05	5.03E-05	3.49E-05	2.73E-05	2.32E-05	5.28E-05	1.20E-04	2.29E-04	4.05E-04	3.72E-04	3.09E-04	2.89E-04	1.57E-04	1.44E-04	1.56E-04	1.69E-04	1.79E-04	2.06E-04	2.30E-04	2.12E-04	1.47E-04	1.12E-04	1.02E-04	8.78E-05
	Emission in each Box of 2nd jet	g/s	3.61E-05	2.52E-05	1.75E-05	1.36E-05	1.16E-05	2.64E-05	6.02E-05	1.15E-04	2.03E-04	1.86E-04	1.55E-04	1.44E-04	7.85E-05	7.18E-05	7.81E-05	8.46E-05	8.95E-05	1.03E-04	1.15E-04	1.06E-04	7.37E-05	5.62E-05	5.12E-05	4.39E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0011***	***0.0010***	***0.0008***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0005***	***0.0006***	***0.0007***	***0.0007***	***0.0004***	***0.0003***	***0.0003***	***0.0002***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.22E-04	9.66E-05	6.66E-05	5.10E-05	4.28E-05	6.49E-05	1.42E-04	3.38E-04	7.39E-04	6.78E-04	5.57E-04	5.13E-04	3.16E-04	2.85E-04	3.14E-04	3.42E-04	3.62E-04	4.19E-04	4.75E-04	4.36E-04	2.93E-04	2.15E-04	1.94E-04	1.67E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.11E-05	4.83E-05	3.33E-05	2.55E-05	2.14E-05	3.24E-05	7.11E-05	1.69E-04	3.70E-04	3.39E-04	2.79E-04	2.57E-04	1.58E-04	1.43E-04	1.57E-04	1.71E-04	1.81E-04	2.10E-04	2.37E-04	2.18E-04	1.47E-04	1.07E-04	9.69E-05	8.33E-05
	Emission in each Box of 1st jet	g/s	1.22E-05	9.66E-06	6.66E-06	5.10E-06	4.28E-06	6.49E-06	1.42E-05	3.38E-05	7.39E-05	6.78E-05	5.57E-05	5.13E-05	3.16E-05	2.85E-05	3.14E-05	3.42E-05	3.62E-05	4.19E-05	4.75E-05	4.36E-05	2.93E-05	2.15E-05	1.94E-05	1.67E-05
	Emission in each Box of 2nd jet	g/s	6.11E-06	4.83E-06	3.33E-06	2.55E-06	2.14E-06	3.24E-06	7.11E-06	1.69E-05	3.70E-05	3.39E-05	2.79E-05	2.57E-05	1.58E-05	1.43E-05	1.57E-05	1.71E-05	1.81E-05	2.10E-05	2.37E-05	2.18E-05	1.47E-05	1.07E-05	9.69E-06	8.33E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	104D01-104D20
Enclosure Involvec	104P4
Road Located	123
Vehicle EF Adopte	104

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	361	296	202	150	125	150	321	803	1200	1166	1075	1030	696	652	691	725	748	805	851	815	672	554	516	452
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1258	0.1062	0.1080	0.1128	0.1168	0.2194	0.2329	0.1774	0.2097	0.1980	0.1778	0.1736	0.1393	0.1360	0.1400	0.1442	0.1478	0.1574	0.1687	0.1600	0.1354	0.1251	0.1241	0.1214
	NO2	g/vehicle/km	0.0211	0.0202	0.0204	0.0210	0.0213	0.0268	0.0274	0.0260	0.0380	0.0358	0.0319	0.0307	0.0280	0.0270	0.0281	0.0291	0.0298	0.0319	0.0346	0.0328	0.0268	0.0237	0.0232	0.0228
	RSP	g/vehicle/km	0.0085	0.0071	0.0073	0.0076	0.0078	0.0151	0.0160	0.0117	0.0119	0.0114	0.0108	0.0106	0.0087	0.0087	0.0088	0.0089	0.0089	0.0093	0.0097	0.0093	0.0085	0.0084	0.0083	0.0081
	FSP	g/vehicle/km	0.0079	0.0066	0.0067	0.0070	0.0072	0.0139	0.0147	0.0107	0.0109	0.0105	0.0099	0.0098	0.0081	0.0080	0.0081	0.0082	0.0082	0.0086	0.0089	0.0086	0.0078	0.0077	0.0076	0.0075
Parameters of the Enclosure	Width of Enclosure	m	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Height of Enclosure	m	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Length of Tunnel	m	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89	90.89
	Number of 1st 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Number of 2nd 50m Box	#	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
NO Emission Rate		g/s	***0.0011***	***0.0008***	***0.0006***	***0.0004***	***0.0004***	***0.0008***	***0.0019***	***0.0036***	***0.0064***	***0.0058***	***0.0048***	***0.0045***	***0.0024***	***0.0022***	***0.0024***	***0.0026***	***0.0028***	***0.0032***	***0.0036***	***0.0033***	***0.0023***	***0.0018***	***0.0016***	***0.0014***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.64E-04	5.29E-04	3.67E-04	2.85E-04	2.46E-04	5.54E-04	1.26E-03	2.40E-03	4.23E-03	3.89E-03	3.22E-03	3.01E-03	1.63E-03	1.49E-03	1.63E-03	1.76E-03	1.86E-03	2.13E-03	2.42E-03	2.20E-03	1.53E-03	1.17E-03	1.08E-03	9.24E-04
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.82E-04	2.65E-04	1.84E-04	1.42E-04	1.23E-04	2.77E-04	6.29E-04	1.20E-03	2.12E-03	1.94E-03	1.61E-03	1.50E-03	8.16E-04	7.46E-04	8.14E-04	8.80E-04	9.30E-04	1.07E-03	1.21E-03	1.10E-03	7.66E-04	5.83E-04	5.39E-04	4.62E-04
	Emission in each Box of 1st jet	g/s	7.64E-05	5.29E-05	3.67E-05	2.85E-05	2.46E-05	5.54E-05	1.26E-04	2.40E-04	4.23E-04	3.89E-04	3.22E-04	3.01E-04	1.63E-04	1.49E-04	1.63E-04	1.76E-04	1.86E-04	2.13E-04	2.42E-04	2.20E-04	1.53E-04	1.17E-04	1.08E-04	9.24E-05
	Emission in each Box of 2nd jet	g/s	3.82E-05	2.65E-05	1.84E-05	1.42E-05	1.23E-05	2.77E-05	6.29E-05	1.20E-04	2.12E-04	1.94E-04	1.61E-04	1.50E-04	8.16E-05	7.46E-05	8.14E-05	8.80E-05	9.30E-05	1.07E-04	1.21E-04	1.10E-04	7.66E-05	5.83E-05	5.39E-05	4.62E-05
NO_2 Emission Rate		g/s	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0001***	***0.0001***	***0.0002***	***0.0005***	***0.0012***	***0.0011***	***0.0009***	***0.0008***	***0.0005***	***0.0004***	***0.0005***	***0.0005***	***0.0006***	***0.0006***	***0.0007***	***0.0007***	***0.0005***	***0.0003***	***0.0003***	***0.0003***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.28E-04	1.01E-04	6.95E-05	5.29E-05	4.48E-05	6.77E-05	1.48E-04	3.51E-04	7.67E-04	7.03E-04	5.77E-04	5.32E-04	3.28E-04	2.96E-04	3.27E-04	3.55E-04	3.75E-04	4.33E-04	4.95E-04	4.50E-04	3.03E-04	2.21E-04	2.02E-04	1.73E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	6.42E-05	5.03E-05	3.47E-05	2.65E-05	2.24E-05	3.39E-05	7.40E-05	1.76E-04	3.84E-04	3.51E-04	2.88E-04	2.66E-04	1.64E-04	1.48E-04	1.63E-04	1.78E-04	1.87E-04	2.16E-04	2.48E-04	2.25E-04	1.52E-04	1.11E-04	1.01E-04	8.67E-05
	Emission in each Box of 1st jet	g/s	1.28E-05	1.01E-05	6.95E-06	5.29E-06	4.48E-06	6.77E-06	1.48E-05	3.51E-05	7.67E-05	7.03E-05	5.77E-05	5.32E-05	3.28E-05	2.96E-05	3.27E-05	3.55E-05	3.75E-05	4.33E-05	4.95E-05	4.50E-05	3.03E-05	2.21E-05	2.02E-05	1.73E-05
	Emission in each Box of 2nd jet	g/s	6.42E-06	5.03E-06	3.47E-06	2.65E-06	2.24E-06	3.39E-06	7.40E-06	1.76E-05	3.84E-05	3.51E-05	2.88E-05	2.66E-05	1.64E-05	1.48E-05	1.63E-05	1.78E-05	1.87E-05	2.16E-05	2.48E-05	2.25E-05	1.52E-05	1.11E-05	1.01E-05	8.67E-06
RSP Emission Rate		g/s	***7.79E-05***	***5.32E-05***	***3.73E-05***	***2.89E-05***	***2.48E-05***	***5.70E-05***	***1.30E-04***	***2.37E-04***	***3.59E-04***	***3.34E-04***	***2.92E-04***	***2.76E-04***	***1.54E-04***	***1.44E-04***	***1.53E-04***	***1.63E-04***	***1.69E-04***	***1.89E-04***	***2.08E-04***	***1.91E-04***	***1.44E-04***	***1.17E-04***	***1.09E-04***	***9.28E-05***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.19E-05	3.55E-05	2.48E-05	1.93E-05	1.65E-05	3.80E-05	8.66E-05	1.58E-04	2.40E-04	2.23E-04	1.95E-04	1.84E-04	1.02E-04	9.59E-05	1.02E-04	1.09E-04	1.12E-04	1.26E-04	1.39E-04	1.28E-04	9.62E-05	7.80E-05	7.24E-05	6.19E-05
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.60E-05	1.77E-05	1.24E-05	9.64E-06	8.25E-06	1.90E-05	4.33E-05	7.89E-05	1.20E-04	1.11E-04	9.74E-05	9.19E-05	5.12E-05	4.79E-05	5.09E-05	5.44E-05	5.62E-05	6.31E-05	6.93E-05	6.38E-05	4.81E-05	3.90E-05	3.62E-05	3.09E-05
	Emission in each Box of 1st jet	g/s	5.19E-06	3.55E-06	2.48E-06	1.93E-06	1.65E-06	3.80E-06	8.66E-06	1.58E-05	2.40E-05	2.23E-05	1.95E-05	1.84E-05	1.02E-05	9.59E-06	1.02E-05	1.09E-05	1.12E-05	1.26E-05	1.39E-05	1.28E-05	9.62E-06	7.80E-06	7.24E-06	6.19E-06
	Emission in each Box of 2nd jet	g/s	2.60E-06	1.77E-06	1.24E-06	9.64E-07	8.25E-07	1.90E-06	4.33E-06	7.89E-06	1.20E-05	1.11E-05	9.74E-06	9.19E-06	5.12E-06	4.79E-06	5.09E-06	5.44E-06	5.62E-06	6.31E-06	6.93E-06	6.38E-06	4.81E-06	3.90E-06	3.62E-06	3.09E-06
FSP Emission Rate		g/s	***7.18E-05***	***4.90E-05***	***3.43E-05***	***2.66E-05***	***2.26E-05***	***5.25E-05***	***1.19E-04***	***2.17E-04***	***3.31E-04***	***3.08E-04***	***2.70E-04***	***2.55E-04***	***1.42E-04***	***1.32E-04***	***1.41E-04***	***1.51E-04***	***1.56E-04***	***1.74E-04***	***1.91E-04***	***1.77E-04***	***1.33E-04***	***1.08E-04***	***9.92E-05***	***8.55E-05***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.79E-05	3.27E-05	2.29E-05	1.78E-05	1.51E-05	3.50E-05	7.96E-05	1.45E-04	2.21E-04	2.05E-04	1.80E-04	1.70E-04	9.44E-05	8.78E-05	9.40E-05	1.01E-04	1.04E-04	1.16E-04	1.28E-04	1.18E-04	8.87E-05	7.19E-05	6.61E-05	5.70E-05
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.39E-05	1.63E-05	1.14E-05	8.88E-06	7.54E-06	1.75E-05	3.98E-05	7.23E-05	1.10E-04	1.03E-04	8.99E-05	8.50E-05	4.72E-05	4.39E-05	4.70E-05	5.03E-05	5.19E-05	5.79E-05	6.38E-05	5.89E-05	4.43E-05	3.59E-05	3.31E-05	2.85E-05
	Emission in each Box of 1st jet	g/s	4.79E-06	3.27E-06	2.29E-06	1.78E-06	1.51E-06	3.50E-06	7.96E-06	1.45E-05	2.21E-05	2.05E-05	1.80E-05	1.70E-05	9.44E-06	8.78E-06	9.40E-06	1.01E-05	1.04E-05	1.16E-05	1.28E-05	1.18E-05	8.87E-06	7.19E-06	6.61E-06	5.70E-06
	Emission in each Box of 2nd jet	g/s	2.39E-06	1.63E-06	1.14E-06	8.88E-07	7.54E-07	1.75E-06	3.98E-06	7.23E-06	1.10E-05	1.03E-05	8.99E-06	8.50E-06	4.72E-06	4.39E-06	4.70E-06	5.03E-06	5.19E-06	5.79E-06	6.38E-06	5.89E-06	4.43E-06	3.59E-06	3.31E-06	2.85E-06
Initial Lateral Dimension		σy	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Initial Vertical Dimension		σz	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256	5.256

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1832	0.1389	0.1437	0.1546	0.1656	0.3822	0.4105	0.2762	0.2065	0.2039	0.2073	0.2105	0.1566	0.1579	0.1542	0.1559	0.1548	0.1538	0.1524	0.1488	0.1530	0.1605	0.1622	0.1566
	NO2	g/vehicle/km	0.0276	0.0258	0.0266	0.0275	0.0281	0.0393	0.0405	0.0328	0.0292	0.0290	0.0295	0.0296	0.0273	0.0273	0.0270	0.0271	0.0267	0.0265	0.0264	0.0262	0.0265	0.0269	0.0270	0.0266
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0065***	***0.0040***	***0.0029***	***0.0023***	***0.0021***	***0.0061***	***0.0140***	***0.0223***	***0.0245***	***0.0234***	***0.0219***	***0.0213***	***0.0146***	***0.0137***	***0.0142***	***0.0151***	***0.0156***	***0.0168***	***0.0176***	***0.0165***	***0.0139***	***0.0119***	***0.0113***	***0.0096***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.33E-03	2.65E-03	1.90E-03	1.53E-03	1.37E-03	4.07E-03	9.34E-03	1.49E-02	1.63E-02	1.56E-02	1.46E-02	1.42E-02	9.71E-03	9.16E-03	9.49E-03	1.01E-02	1.04E-02	1.12E-02	1.17E-02	1.10E-02	9.24E-03	7.94E-03	7.51E-03	6.39E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.17E-03	1.33E-03	9.52E-04	7.63E-04	6.85E-04	2.03E-03	4.67E-03	7.44E-03	8.15E-03	7.80E-03	7.31E-03	7.11E-03	4.85E-03	4.58E-03	4.75E-03	5.04E-03	5.22E-03	5.59E-03	5.85E-03	5.49E-03	4.62E-03	3.97E-03	3.75E-03	3.20E-03
	Emission in each Box of 1st jet	g/s	2.17E-03	1.33E-03	9.52E-04	7.63E-04	6.85E-04	2.03E-03	4.67E-03	7.44E-03	8.15E-03	7.80E-03	7.31E-03	7.11E-03	4.85E-03	4.58E-03	4.75E-03	5.04E-03	5.22E-03	5.59E-03	5.85E-03	5.49E-03	4.62E-03	3.97E-03	3.75E-03	3.20E-03
	Emission in each Box of 2nd jet	g/s	2.17E-03	1.33E-03	9.52E-04	7.63E-04	6.85E-04	2.03E-03	4.67E-03	7.44E-03	8.15E-03	7.80E-03	7.31E-03	7.11E-03	4.85E-03	4.58E-03	4.75E-03	5.04E-03	5.22E-03	5.59E-03	5.85E-03	5.49E-03	4.62E-03	3.97E-03	3.75E-03	3.20E-03
NO_2 Emission Rate		g/s	***0.0010***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0014***	***0.0027***	***0.0035***	***0.0033***	***0.0031***	***0.0030***	***0.0025***	***0.0024***	***0.0025***	***0.0026***	***0.0027***	***0.0029***	***0.0030***	***0.0029***	***0.0024***	***0.0020***	***0.0019***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.52E-04	4.93E-04	3.53E-04	2.72E-04	2.33E-04	4.18E-04	9.22E-04	1.77E-03	2.31E-03	2.22E-03	2.08E-03	2.00E-03	1.69E-03	1.58E-03	1.66E-03	1.75E-03	1.80E-03	1.93E-03	2.03E-03	1.93E-03	1.60E-03	1.33E-03	1.25E-03	1.09E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.26E-04	2.46E-04	1.76E-04	1.36E-04	1.16E-04	2.09E-04	4.61E-04	8.84E-04	1.15E-03	1.11E-03	1.04E-03	1.00E-03	8.45E-04	7.91E-04	8.30E-04	8.75E-04	8.99E-04	9.63E-04	1.01E-03	9.67E-04	7.99E-04	6.66E-04	6.25E-04	5.43E-04
	Emission in each Box of 1st jet	g/s	3.26E-04	2.46E-04	1.76E-04	1.36E-04	1.16E-04	2.09E-04	4.61E-04	8.84E-04	1.15E-03	1.11E-03	1.04E-03	1.00E-03	8.45E-04	7.91E-04	8.30E-04	8.75E-04	8.99E-04	9.63E-04	1.01E-03	9.67E-04	7.99E-04	6.66E-04	6.25E-04	5.43E-04
	Emission in each Box of 2nd jet	g/s	3.26E-04	2.46E-04	1.76E-04	1.36E-04	1.16E-04	2.09E-04	4.61E-04	8.84E-04	1.15E-03	1.11E-03	1.04E-03	1.00E-03	8.45E-04	7.91E-04	8.30E-04	8.75E-04	8.99E-04	9.63E-04	1.01E-03	9.67E-04	7.99E-04	6.66E-04	6.25E-04	5.43E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1712	0.1283	0.1323	0.1441	0.1542	0.3577	0.3807	0.2586	0.1911	0.1864	0.1909	0.1939	0.1440	0.1463	0.1441	0.1444	0.1431	0.1429	0.1414	0.1391	0.1430	0.1504	0.1502	0.1449
	NO2	g/vehicle/km	0.0260	0.0242	0.0249	0.0260	0.0265	0.0369	0.0378	0.0309	0.0273	0.0268	0.0274	0.0275	0.0253	0.0255	0.0253	0.0253	0.0249	0.0249	0.0247	0.0248	0.0249	0.0254	0.0252	0.0248
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0061***	***0.0037***	***0.0026***	***0.0021***	***0.0019***	***0.0057***	***0.0130***	***0.0209***	***0.0226***	***0.0214***	***0.0202***	***0.0196***	***0.0134***	***0.0127***	***0.0133***	***0.0140***	***0.0145***	***0.0156***	***0.0163***	***0.0154***	***0.0130***	***0.0112***	***0.0104***	***0.0089***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.05E-03	2.45E-03	1.75E-03	1.42E-03	1.28E-03	3.81E-03	8.66E-03	1.39E-02	1.51E-02	1.43E-02	1.35E-02	1.31E-02	8.93E-03	8.49E-03	8.87E-03	9.34E-03	9.64E-03	1.04E-02	1.09E-02	1.03E-02	8.64E-03	7.44E-03	6.95E-03	5.92E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.03E-03	1.22E-03	8.77E-04	7.12E-04	6.38E-04	1.90E-03	4.33E-03	6.97E-03	7.55E-03	7.14E-03	6.73E-03	6.55E-03	4.46E-03	4.24E-03	4.43E-03	4.67E-03	4.82E-03	5.19E-03	5.43E-03	5.13E-03	4.32E-03	3.72E-03	3.48E-03	2.96E-03
	Emission in each Box of 1st jet	g/s	2.03E-03	1.22E-03	8.77E-04	7.12E-04	6.38E-04	1.90E-03	4.33E-03	6.97E-03	7.55E-03	7.14E-03	6.73E-03	6.55E-03	4.46E-03	4.24E-03	4.43E-03	4.67E-03	4.82E-03	5.19E-03	5.43E-03	5.13E-03	4.32E-03	3.72E-03	3.48E-03	2.96E-03
	Emission in each Box of 2nd jet	g/s	2.03E-03	1.22E-03	8.77E-04	7.12E-04	6.38E-04	1.90E-03	4.33E-03	6.97E-03	7.55E-03	7.14E-03	6.73E-03	6.55E-03	4.46E-03	4.24E-03	4.43E-03	4.67E-03	4.82E-03	5.19E-03	5.43E-03	5.13E-03	4.32E-03	3.72E-03	3.48E-03	2.96E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0025***	***0.0032***	***0.0031***	***0.0029***	***0.0028***	***0.0023***	***0.0022***	***0.0023***	***0.0024***	***0.0025***	***0.0027***	***0.0028***	***0.0027***	***0.0023***	***0.0019***	***0.0018***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.15E-04	4.61E-04	3.29E-04	2.56E-04	2.19E-04	3.93E-04	8.61E-04	1.66E-03	2.15E-03	2.05E-03	1.93E-03	1.86E-03	1.57E-03	1.48E-03	1.56E-03	1.63E-03	1.68E-03	1.81E-03	1.90E-03	1.83E-03	1.51E-03	1.26E-03	1.17E-03	1.01E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.07E-04	2.31E-04	1.65E-04	1.28E-04	1.10E-04	1.96E-04	4.30E-04	8.31E-04	1.08E-03	1.02E-03	9.65E-04	9.28E-04	7.83E-04	7.39E-04	7.80E-04	8.16E-04	8.38E-04	9.03E-04	9.49E-04	9.13E-04	7.53E-04	6.28E-04	5.84E-04	5.07E-04
	Emission in each Box of 1st jet	g/s	3.07E-04	2.31E-04	1.65E-04	1.28E-04	1.10E-04	1.96E-04	4.30E-04	8.31E-04	1.08E-03	1.02E-03	9.65E-04	9.28E-04	7.83E-04	7.39E-04	7.80E-04	8.16E-04	8.38E-04	9.03E-04	9.49E-04	9.13E-04	7.53E-04	6.28E-04	5.84E-04	5.07E-04
	Emission in each Box of 2nd jet	g/s	3.07E-04	2.31E-04	1.65E-04	1.28E-04	1.10E-04	1.96E-04	4.30E-04	8.31E-04	1.08E-03	1.02E-03	9.65E-04	9.28E-04	7.83E-04	7.39E-04	7.80E-04	8.16E-04	8.38E-04	9.03E-04	9.49E-04	9.13E-04	7.53E-04	6.28E-04	5.84E-04	5.07E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1615	0.1209	0.1250	0.1341	0.1436	0.3353	0.3579	0.2434	0.1802	0.1773	0.1795	0.1848	0.1372	0.1373	0.1352	0.1371	0.1343	0.1349	0.1344	0.1311	0.1342	0.1411	0.1408	0.1362
	NO2	g/vehicle/km	0.0246	0.0229	0.0237	0.0244	0.0249	0.0348	0.0357	0.0292	0.0258	0.0256	0.0259	0.0263	0.0242	0.0240	0.0239	0.0241	0.0235	0.0236	0.0236	0.0235	0.0236	0.0240	0.0239	0.0235
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0057***	***0.0035***	***0.0025***	***0.0020***	***0.0018***	***0.0054***	***0.0122***	***0.0197***	***0.0213***	***0.0204***	***0.0190***	***0.0187***	***0.0128***	***0.0119***	***0.0125***	***0.0133***	***0.0136***	***0.0147***	***0.0155***	***0.0145***	***0.0122***	***0.0105***	***0.0098***	***0.0083***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.82E-03	2.31E-03	1.66E-03	1.32E-03	1.19E-03	3.57E-03	8.14E-03	1.31E-02	1.42E-02	1.36E-02	1.27E-02	1.25E-02	8.51E-03	7.96E-03	8.32E-03	8.86E-03	9.05E-03	9.80E-03	1.03E-02	9.66E-03	8.10E-03	6.98E-03	6.52E-03	5.56E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.91E-03	1.15E-03	8.29E-04	6.62E-04	5.94E-04	1.78E-03	4.07E-03	6.56E-03	7.11E-03	6.79E-03	6.33E-03	6.24E-03	4.25E-03	3.98E-03	4.16E-03	4.43E-03	4.53E-03	4.90E-03	5.16E-03	4.83E-03	4.05E-03	3.49E-03	3.26E-03	2.78E-03
	Emission in each Box of 1st jet	g/s	1.91E-03	1.15E-03	8.29E-04	6.62E-04	5.94E-04	1.78E-03	4.07E-03	6.56E-03	7.11E-03	6.79E-03	6.33E-03	6.24E-03	4.25E-03	3.98E-03	4.16E-03	4.43E-03	4.53E-03	4.90E-03	5.16E-03	4.83E-03	4.05E-03	3.49E-03	3.26E-03	2.78E-03
	Emission in each Box of 2nd jet	g/s	1.91E-03	1.15E-03	8.29E-04	6.62E-04	5.94E-04	1.78E-03	4.07E-03	6.56E-03	7.11E-03	6.79E-03	6.33E-03	6.24E-03	4.25E-03	3.98E-03	4.16E-03	4.43E-03	4.53E-03	4.90E-03	5.16E-03	4.83E-03	4.05E-03	3.49E-03	3.26E-03	2.78E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0012***	***0.0024***	***0.0031***	***0.0029***	***0.0027***	***0.0027***	***0.0022***	***0.0021***	***0.0022***	***0.0023***	***0.0024***	***0.0026***	***0.0027***	***0.0026***	***0.0021***	***0.0018***	***0.0017***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.83E-04	4.38E-04	3.14E-04	2.41E-04	2.06E-04	3.70E-04	8.13E-04	1.57E-03	2.04E-03	1.96E-03	1.82E-03	1.78E-03	1.50E-03	1.39E-03	1.47E-03	1.56E-03	1.59E-03	1.72E-03	1.81E-03	1.73E-03	1.42E-03	1.19E-03	1.10E-03	9.61E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.91E-04	2.19E-04	1.57E-04	1.21E-04	1.03E-04	1.85E-04	4.06E-04	7.87E-04	1.02E-03	9.78E-04	9.12E-04	8.88E-04	7.49E-04	6.97E-04	7.36E-04	7.79E-04	7.93E-04	8.58E-04	9.07E-04	8.65E-04	7.12E-04	5.94E-04	5.52E-04	4.80E-04
	Emission in each Box of 1st jet	g/s	2.91E-04	2.19E-04	1.57E-04	1.21E-04	1.03E-04	1.85E-04	4.06E-04	7.87E-04	1.02E-03	9.78E-04	9.12E-04	8.88E-04	7.49E-04	6.97E-04	7.36E-04	7.79E-04	7.93E-04	8.58E-04	9.07E-04	8.65E-04	7.12E-04	5.94E-04	5.52E-04	4.80E-04
	Emission in each Box of 2nd jet	g/s	2.91E-04	2.19E-04	1.57E-04	1.21E-04	1.03E-04	1.85E-04	4.06E-04	7.87E-04	1.02E-03	9.78E-04	9.12E-04	8.88E-04	7.49E-04	6.97E-04	7.36E-04	7.79E-04	7.93E-04	8.58E-04	9.07E-04	8.65E-04	7.12E-04	5.94E-04	5.52E-04	4.80E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1517	0.1132	0.1166	0.1281	0.1373	0.3226	0.3444	0.2318	0.1714	0.1689	0.1708	0.1756	0.1303	0.1326	0.1305	0.1300	0.1301	0.1282	0.1278	0.1238	0.1271	0.1359	0.1351	0.1301
	NO2	g/vehicle/km	0.0233	0.0217	0.0223	0.0235	0.0240	0.0336	0.0344	0.0279	0.0247	0.0244	0.0247	0.0251	0.0231	0.0233	0.0232	0.0230	0.0228	0.0225	0.0226	0.0223	0.0225	0.0232	0.0230	0.0226
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0054***	***0.0032***	***0.0023***	***0.0019***	***0.0017***	***0.0052***	***0.0118***	***0.0187***	***0.0203***	***0.0194***	***0.0181***	***0.0178***	***0.0121***	***0.0115***	***0.0121***	***0.0126***	***0.0132***	***0.0140***	***0.0147***	***0.0137***	***0.0115***	***0.0101***	***0.0094***	***0.0080***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.59E-03	2.16E-03	1.54E-03	1.27E-03	1.14E-03	3.43E-03	7.84E-03	1.25E-02	1.35E-02	1.29E-02	1.20E-02	1.19E-02	8.08E-03	7.69E-03	8.04E-03	8.41E-03	8.77E-03	9.32E-03	9.81E-03	9.13E-03	7.68E-03	6.72E-03	6.26E-03	5.32E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.79E-03	1.08E-03	7.72E-04	6.33E-04	5.68E-04	1.72E-03	3.92E-03	6.24E-03	6.77E-03	6.46E-03	6.02E-03	5.93E-03	4.04E-03	3.84E-03	4.02E-03	4.20E-03	4.39E-03	4.66E-03	4.90E-03	4.57E-03	3.84E-03	3.36E-03	3.13E-03	2.66E-03
	Emission in each Box of 1st jet	g/s	1.79E-03	1.08E-03	7.72E-04	6.33E-04	5.68E-04	1.72E-03	3.92E-03	6.24E-03	6.77E-03	6.46E-03	6.02E-03	5.93E-03	4.04E-03	3.84E-03	4.02E-03	4.20E-03	4.39E-03	4.66E-03	4.90E-03	4.57E-03	3.84E-03	3.36E-03	3.13E-03	2.66E-03
	Emission in each Box of 2nd jet	g/s	1.79E-03	1.08E-03	7.72E-04	6.33E-04	5.68E-04	1.72E-03	3.92E-03	6.24E-03	6.77E-03	6.46E-03	6.02E-03	5.93E-03	4.04E-03	3.84E-03	4.02E-03	4.20E-03	4.39E-03	4.66E-03	4.90E-03	4.57E-03	3.84E-03	3.36E-03	3.13E-03	2.66E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0012***	***0.0023***	***0.0029***	***0.0028***	***0.0026***	***0.0025***	***0.0021***	***0.0020***	***0.0021***	***0.0022***	***0.0023***	***0.0025***	***0.0026***	***0.0025***	***0.0020***	***0.0017***	***0.0016***	***0.0014***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.51E-04	4.14E-04	2.95E-04	2.32E-04	1.98E-04	3.57E-04	7.84E-04	1.50E-03	1.95E-03	1.87E-03	1.74E-03	1.69E-03	1.43E-03	1.35E-03	1.43E-03	1.48E-03	1.54E-03	1.64E-03	1.73E-03	1.65E-03	1.36E-03	1.15E-03	1.06E-03	9.22E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.75E-04	2.07E-04	1.48E-04	1.16E-04	9.92E-05	1.79E-04	3.92E-04	7.52E-04	9.74E-04	9.35E-04	8.72E-04	8.47E-04	7.15E-04	6.75E-04	7.13E-04	7.42E-04	7.70E-04	8.19E-04	8.67E-04	8.23E-04	6.79E-04	5.75E-04	5.32E-04	4.61E-04
	Emission in each Box of 1st jet	g/s	2.75E-04	2.07E-04	1.48E-04	1.16E-04	9.92E-05	1.79E-04	3.92E-04	7.52E-04	9.74E-04	9.35E-04	8.72E-04	8.47E-04	7.15E-04	6.75E-04	7.13E-04	7.42E-04	7.70E-04	8.19E-04	8.67E-04	8.23E-04	6.79E-04	5.75E-04	5.32E-04	4.61E-04
	Emission in each Box of 2nd jet	g/s	2.75E-04	2.07E-04	1.48E-04	1.16E-04	9.92E-05	1.79E-04	3.92E-04	7.52E-04	9.74E-04	9.35E-04	8.72E-04	8.47E-04	7.15E-04	6.75E-04	7.13E-04	7.42E-04	7.70E-04	8.19E-04	8.67E-04	8.23E-04	6.79E-04	5.75E-04	5.32E-04	4.61E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1364	0.1008	0.1041	0.1113	0.1193	0.2816	0.2971	0.2014	0.1507	0.1477	0.1520	0.1559	0.1165	0.1180	0.1170	0.1159	0.1157	0.1156	0.1123	0.1109	0.1137	0.1181	0.1183	0.1137
	NO2	g/vehicle/km	0.0211	0.0195	0.0201	0.0207	0.0212	0.0295	0.0300	0.0244	0.0218	0.0215	0.0221	0.0224	0.0207	0.0208	0.0209	0.0206	0.0204	0.0205	0.0200	0.0201	0.0202	0.0204	0.0203	0.0199
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0048***	***0.0029***	***0.0021***	***0.0016***	***0.0015***	***0.0045***	***0.0101***	***0.0163***	***0.0179***	***0.0170***	***0.0161***	***0.0158***	***0.0108***	***0.0103***	***0.0108***	***0.0112***	***0.0117***	***0.0126***	***0.0129***	***0.0123***	***0.0103***	***0.0088***	***0.0082***	***0.0070***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.23E-03	1.92E-03	1.38E-03	1.10E-03	9.87E-04	3.00E-03	6.76E-03	1.09E-02	1.19E-02	1.13E-02	1.07E-02	1.05E-02	7.22E-03	6.84E-03	7.20E-03	7.50E-03	7.79E-03	8.40E-03	8.62E-03	8.18E-03	6.86E-03	5.84E-03	5.48E-03	4.64E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.61E-03	9.62E-04	6.90E-04	5.50E-04	4.94E-04	1.50E-03	3.38E-03	5.43E-03	5.95E-03	5.65E-03	5.36E-03	5.27E-03	3.61E-03	3.42E-03	3.60E-03	3.75E-03	3.90E-03	4.20E-03	4.31E-03	4.09E-03	3.43E-03	2.92E-03	2.74E-03	2.32E-03
	Emission in each Box of 1st jet	g/s	1.61E-03	9.62E-04	6.90E-04	5.50E-04	4.94E-04	1.50E-03	3.38E-03	5.43E-03	5.95E-03	5.65E-03	5.36E-03	5.27E-03	3.61E-03	3.42E-03	3.60E-03	3.75E-03	3.90E-03	4.20E-03	4.31E-03	4.09E-03	3.43E-03	2.92E-03	2.74E-03	2.32E-03
	Emission in each Box of 2nd jet	g/s	1.61E-03	9.62E-04	6.90E-04	5.50E-04	4.94E-04	1.50E-03	3.38E-03	5.43E-03	5.95E-03	5.65E-03	5.36E-03	5.27E-03	3.61E-03	3.42E-03	3.60E-03	3.75E-03	3.90E-03	4.20E-03	4.31E-03	4.09E-03	3.43E-03	2.92E-03	2.74E-03	2.32E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0020***	***0.0026***	***0.0025***	***0.0023***	***0.0023***	***0.0019***	***0.0018***	***0.0019***	***0.0020***	***0.0021***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.98E-04	3.73E-04	2.67E-04	2.05E-04	1.75E-04	3.14E-04	6.82E-04	1.32E-03	1.72E-03	1.65E-03	1.56E-03	1.51E-03	1.28E-03	1.21E-03	1.28E-03	1.33E-03	1.38E-03	1.49E-03	1.54E-03	1.48E-03	1.22E-03	1.01E-03	9.40E-04	8.14E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.49E-04	1.86E-04	1.33E-04	1.02E-04	8.75E-05	1.57E-04	3.41E-04	6.58E-04	8.62E-04	8.24E-04	7.80E-04	7.57E-04	6.42E-04	6.04E-04	6.42E-04	6.66E-04	6.88E-04	7.43E-04	7.68E-04	7.42E-04	6.11E-04	5.04E-04	4.70E-04	4.07E-04
	Emission in each Box of 1st jet	g/s	2.49E-04	1.86E-04	1.33E-04	1.02E-04	8.75E-05	1.57E-04	3.41E-04	6.58E-04	8.62E-04	8.24E-04	7.80E-04	7.57E-04	6.42E-04	6.04E-04	6.42E-04	6.66E-04	6.88E-04	7.43E-04	7.68E-04	7.42E-04	6.11E-04	5.04E-04	4.70E-04	4.07E-04
	Emission in each Box of 2nd jet	g/s	2.49E-04	1.86E-04	1.33E-04	1.02E-04	8.75E-05	1.57E-04	3.41E-04	6.58E-04	8.62E-04	8.24E-04	7.80E-04	7.57E-04	6.42E-04	6.04E-04	6.42E-04	6.66E-04	6.88E-04	7.43E-04	7.68E-04	7.42E-04	6.11E-04	5.04E-04	4.70E-04	4.07E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1315	0.0977	0.1035	0.1107	0.1180	0.2786	0.2903	0.1990	0.1474	0.1474	0.1471	0.1509	0.1118	0.1141	0.1116	0.1122	0.1137	0.1128	0.1101	0.1096	0.1123	0.1174	0.1169	0.1131
	NO2	g/vehicle/km	0.0204	0.0190	0.0200	0.0206	0.0209	0.0292	0.0293	0.0242	0.0214	0.0215	0.0215	0.0217	0.0200	0.0202	0.0200	0.0200	0.0201	0.0200	0.0197	0.0199	0.0200	0.0203	0.0201	0.0198
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0047***	***0.0028***	***0.0021***	***0.0016***	***0.0015***	***0.0044***	***0.0099***	***0.0161***	***0.0175***	***0.0169***	***0.0156***	***0.0153***	***0.0104***	***0.0099***	***0.0103***	***0.0109***	***0.0115***	***0.0123***	***0.0127***	***0.0121***	***0.0102***	***0.0087***	***0.0081***	***0.0069***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.11E-03	1.87E-03	1.37E-03	1.09E-03	9.76E-04	2.96E-03	6.61E-03	1.07E-02	1.16E-02	1.13E-02	1.04E-02	1.02E-02	6.93E-03	6.62E-03	6.87E-03	7.25E-03	7.66E-03	8.19E-03	8.46E-03	8.08E-03	6.78E-03	5.81E-03	5.41E-03	4.62E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.56E-03	9.33E-04	6.86E-04	5.47E-04	4.88E-04	1.48E-03	3.30E-03	5.36E-03	5.82E-03	5.64E-03	5.19E-03	5.10E-03	3.47E-03	3.31E-03	3.43E-03	3.63E-03	3.83E-03	4.10E-03	4.23E-03	4.04E-03	3.39E-03	2.90E-03	2.71E-03	2.31E-03
	Emission in each Box of 1st jet	g/s	1.56E-03	9.33E-04	6.86E-04	5.47E-04	4.88E-04	1.48E-03	3.30E-03	5.36E-03	5.82E-03	5.64E-03	5.19E-03	5.10E-03	3.47E-03	3.31E-03	3.43E-03	3.63E-03	3.83E-03	4.10E-03	4.23E-03	4.04E-03	3.39E-03	2.90E-03	2.71E-03	2.31E-03
	Emission in each Box of 2nd jet	g/s	1.56E-03	9.33E-04	6.86E-04	5.47E-04	4.88E-04	1.48E-03	3.30E-03	5.36E-03	5.82E-03	5.64E-03	5.19E-03	5.10E-03	3.47E-03	3.31E-03	3.43E-03	3.63E-03	3.83E-03	4.10E-03	4.23E-03	4.04E-03	3.39E-03	2.90E-03	2.71E-03	2.31E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0020***	***0.0025***	***0.0025***	***0.0023***	***0.0022***	***0.0019***	***0.0018***	***0.0018***	***0.0019***	***0.0020***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.82E-04	3.62E-04	2.65E-04	2.04E-04	1.73E-04	3.11E-04	6.67E-04	1.30E-03	1.69E-03	1.65E-03	1.52E-03	1.47E-03	1.24E-03	1.17E-03	1.23E-03	1.29E-03	1.36E-03	1.45E-03	1.51E-03	1.47E-03	1.21E-03	1.00E-03	9.30E-04	8.09E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.41E-04	1.81E-04	1.33E-04	1.02E-04	8.66E-05	1.56E-04	3.33E-04	6.51E-04	8.45E-04	8.23E-04	7.58E-04	7.35E-04	6.20E-04	5.87E-04	6.15E-04	6.46E-04	6.78E-04	7.26E-04	7.55E-04	7.34E-04	6.04E-04	5.02E-04	4.65E-04	4.05E-04
	Emission in each Box of 1st jet	g/s	2.41E-04	1.81E-04	1.33E-04	1.02E-04	8.66E-05	1.56E-04	3.33E-04	6.51E-04	8.45E-04	8.23E-04	7.58E-04	7.35E-04	6.20E-04	5.87E-04	6.15E-04	6.46E-04	6.78E-04	7.26E-04	7.55E-04	7.34E-04	6.04E-04	5.02E-04	4.65E-04	4.05E-04
	Emission in each Box of 2nd jet	g/s	2.41E-04	1.81E-04	1.33E-04	1.02E-04	8.66E-05	1.56E-04	3.33E-04	6.51E-04	8.45E-04	8.23E-04	7.58E-04	7.35E-04	6.20E-04	5.87E-04	6.15E-04	6.46E-04	6.78E-04	7.26E-04	7.55E-04	7.34E-04	6.04E-04	5.02E-04	4.65E-04	4.05E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1324	0.0971	0.1003	0.1071	0.1149	0.2700	0.2903	0.1940	0.1438	0.1425	0.1477	0.1527	0.1097	0.1120	0.1129	0.1127	0.1116	0.1124	0.1090	0.1083	0.1103	0.1160	0.1154	0.1102
	NO2	g/vehicle/km	0.0205	0.0189	0.0195	0.0201	0.0205	0.0284	0.0293	0.0236	0.0209	0.0208	0.0216	0.0220	0.0196	0.0199	0.0202	0.0201	0.0198	0.0199	0.0195	0.0197	0.0197	0.0201	0.0199	0.0193
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0047***	***0.0028***	***0.0020***	***0.0016***	***0.0014***	***0.0043***	***0.0099***	***0.0157***	***0.0170***	***0.0164***	***0.0156***	***0.0155***	***0.0102***	***0.0097***	***0.0104***	***0.0109***	***0.0113***	***0.0122***	***0.0125***	***0.0120***	***0.0100***	***0.0086***	***0.0080***	***0.0068***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.13E-03	1.85E-03	1.33E-03	1.06E-03	9.50E-04	2.87E-03	6.61E-03	1.05E-02	1.14E-02	1.09E-02	1.04E-02	1.03E-02	6.80E-03	6.50E-03	6.95E-03	7.28E-03	7.52E-03	8.17E-03	8.36E-03	7.99E-03	6.66E-03	5.74E-03	5.35E-03	4.50E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.57E-03	9.27E-04	6.64E-04	5.29E-04	4.75E-04	1.44E-03	3.30E-03	5.23E-03	5.68E-03	5.45E-03	5.21E-03	5.16E-03	3.40E-03	3.25E-03	3.47E-03	3.64E-03	3.76E-03	4.08E-03	4.18E-03	3.99E-03	3.33E-03	2.87E-03	2.67E-03	2.25E-03
	Emission in each Box of 1st jet	g/s	1.57E-03	9.27E-04	6.64E-04	5.29E-04	4.75E-04	1.44E-03	3.30E-03	5.23E-03	5.68E-03	5.45E-03	5.21E-03	5.16E-03	3.40E-03	3.25E-03	3.47E-03	3.64E-03	3.76E-03	4.08E-03	4.18E-03	3.99E-03	3.33E-03	2.87E-03	2.67E-03	2.25E-03
	Emission in each Box of 2nd jet	g/s	1.57E-03	9.27E-04	6.64E-04	5.29E-04	4.75E-04	1.44E-03	3.30E-03	5.23E-03	5.68E-03	5.45E-03	5.21E-03	5.16E-03	3.40E-03	3.25E-03	3.47E-03	3.64E-03	3.76E-03	4.08E-03	4.18E-03	3.99E-03	3.33E-03	2.87E-03	2.67E-03	2.25E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0019***	***0.0025***	***0.0024***	***0.0023***	***0.0022***	***0.0018***	***0.0017***	***0.0019***	***0.0019***	***0.0020***	***0.0022***	***0.0022***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.85E-04	3.60E-04	2.58E-04	1.98E-04	1.69E-04	3.02E-04	6.67E-04	1.27E-03	1.65E-03	1.60E-03	1.52E-03	1.48E-03	1.22E-03	1.15E-03	1.24E-03	1.30E-03	1.33E-03	1.45E-03	1.49E-03	1.45E-03	1.19E-03	9.92E-04	9.19E-04	7.90E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.42E-04	1.80E-04	1.29E-04	9.90E-05	8.46E-05	1.51E-04	3.33E-04	6.35E-04	8.25E-04	7.98E-04	7.60E-04	7.42E-04	6.09E-04	5.77E-04	6.22E-04	6.49E-04	6.66E-04	7.24E-04	7.47E-04	7.26E-04	5.94E-04	4.96E-04	4.60E-04	3.95E-04
	Emission in each Box of 1st jet	g/s	2.42E-04	1.80E-04	1.29E-04	9.90E-05	8.46E-05	1.51E-04	3.33E-04	6.35E-04	8.25E-04	7.98E-04	7.60E-04	7.42E-04	6.09E-04	5.77E-04	6.22E-04	6.49E-04	6.66E-04	7.24E-04	7.47E-04	7.26E-04	5.94E-04	4.96E-04	4.60E-04	3.95E-04
	Emission in each Box of 2nd jet	g/s	2.42E-04	1.80E-04	1.29E-04	9.90E-05	8.46E-05	1.51E-04	3.33E-04	6.35E-04	8.25E-04	7.98E-04	7.60E-04	7.42E-04	6.09E-04	5.77E-04	6.22E-04	6.49E-04	6.66E-04	7.24E-04	7.47E-04	7.26E-04	5.94E-04	4.96E-04	4.60E-04	3.95E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1341	0.0991	0.1023	0.1094	0.1173	0.2756	0.2961	0.1990	0.1455	0.1430	0.1501	0.1529	0.1118	0.1141	0.1123	0.1122	0.1144	0.1120	0.1122	0.1083	0.1103	0.1160	0.1155	0.1117
	NO2	g/vehicle/km	0.0207	0.0192	0.0198	0.0204	0.0208	0.0289	0.0298	0.0242	0.0212	0.0209	0.0219	0.0220	0.0200	0.0202	0.0201	0.0200	0.0202	0.0199	0.0200	0.0197	0.0197	0.0201	0.0199	0.0196
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0048***	***0.0028***	***0.0020***	***0.0016***	***0.0015***	***0.0044***	***0.0101***	***0.0161***	***0.0172***	***0.0164***	***0.0159***	***0.0155***	***0.0104***	***0.0099***	***0.0104***	***0.0109***	***0.0116***	***0.0122***	***0.0129***	***0.0120***	***0.0100***	***0.0086***	***0.0080***	***0.0068***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.17E-03	1.89E-03	1.36E-03	1.08E-03	9.70E-04	2.93E-03	6.74E-03	1.07E-02	1.15E-02	1.09E-02	1.06E-02	1.03E-02	6.93E-03	6.62E-03	6.91E-03	7.25E-03	7.71E-03	8.14E-03	8.61E-03	7.98E-03	6.66E-03	5.74E-03	5.35E-03	4.56E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.59E-03	9.46E-04	6.78E-04	5.40E-04	4.85E-04	1.47E-03	3.37E-03	5.36E-03	5.75E-03	5.47E-03	5.29E-03	5.16E-03	3.47E-03	3.31E-03	3.46E-03	3.63E-03	3.85E-03	4.07E-03	4.30E-03	3.99E-03	3.33E-03	2.87E-03	2.67E-03	2.28E-03
	Emission in each Box of 1st jet	g/s	1.59E-03	9.46E-04	6.78E-04	5.40E-04	4.85E-04	1.47E-03	3.37E-03	5.36E-03	5.75E-03	5.47E-03	5.29E-03	5.16E-03	3.47E-03	3.31E-03	3.46E-03	3.63E-03	3.85E-03	4.07E-03	4.30E-03	3.99E-03	3.33E-03	2.87E-03	2.67E-03	2.28E-03
	Emission in each Box of 2nd jet	g/s	1.59E-03	9.46E-04	6.78E-04	5.40E-04	4.85E-04	1.47E-03	3.37E-03	5.36E-03	5.75E-03	5.47E-03	5.29E-03	5.16E-03	3.47E-03	3.31E-03	3.46E-03	3.63E-03	3.85E-03	4.07E-03	4.30E-03	3.99E-03	3.33E-03	2.87E-03	2.67E-03	2.28E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0020***	***0.0025***	***0.0024***	***0.0023***	***0.0022***	***0.0019***	***0.0018***	***0.0019***	***0.0019***	***0.0020***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.91E-04	3.67E-04	2.63E-04	2.02E-04	1.72E-04	3.08E-04	6.79E-04	1.30E-03	1.67E-03	1.60E-03	1.54E-03	1.49E-03	1.24E-03	1.17E-03	1.24E-03	1.29E-03	1.36E-03	1.44E-03	1.54E-03	1.45E-03	1.19E-03	9.92E-04	9.20E-04	8.01E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.45E-04	1.83E-04	1.31E-04	1.01E-04	8.62E-05	1.54E-04	3.40E-04	6.51E-04	8.35E-04	8.00E-04	7.71E-04	7.44E-04	6.20E-04	5.87E-04	6.19E-04	6.46E-04	6.82E-04	7.22E-04	7.68E-04	7.26E-04	5.95E-04	4.96E-04	4.60E-04	4.00E-04
	Emission in each Box of 1st jet	g/s	2.45E-04	1.83E-04	1.31E-04	1.01E-04	8.62E-05	1.54E-04	3.40E-04	6.51E-04	8.35E-04	8.00E-04	7.71E-04	7.44E-04	6.20E-04	5.87E-04	6.19E-04	6.46E-04	6.82E-04	7.22E-04	7.68E-04	7.26E-04	5.95E-04	4.96E-04	4.60E-04	4.00E-04
	Emission in each Box of 2nd jet	g/s	2.45E-04	1.83E-04	1.31E-04	1.01E-04	8.62E-05	1.54E-04	3.40E-04	6.51E-04	8.35E-04	8.00E-04	7.71E-04	7.44E-04	6.20E-04	5.87E-04	6.19E-04	6.46E-04	6.82E-04	7.22E-04	7.68E-04	7.26E-04	5.95E-04	4.96E-04	4.60E-04	4.00E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1331	0.0983	0.1016	0.1078	0.1193	0.2801	0.2993	0.1964	0.1468	0.1446	0.1520	0.1527	0.1132	0.1171	0.1145	0.1151	0.1132	0.1117	0.1116	0.1070	0.1137	0.1188	0.1183	0.1145
	NO2	g/vehicle/km	0.0206	0.0191	0.0197	0.0202	0.0212	0.0294	0.0302	0.0239	0.0213	0.0211	0.0221	0.0220	0.0202	0.0207	0.0205	0.0205	0.0200	0.0198	0.0199	0.0195	0.0202	0.0205	0.0203	0.0200
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0047***	***0.0028***	***0.0020***	***0.0016***	***0.0015***	***0.0045***	***0.0102***	***0.0159***	***0.0174***	***0.0166***	***0.0161***	***0.0155***	***0.0105***	***0.0102***	***0.0106***	***0.0112***	***0.0114***	***0.0122***	***0.0128***	***0.0118***	***0.0103***	***0.0088***	***0.0082***	***0.0070***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.15E-03	1.88E-03	1.35E-03	1.06E-03	9.87E-04	2.98E-03	6.81E-03	1.06E-02	1.16E-02	1.11E-02	1.07E-02	1.03E-02	7.02E-03	6.79E-03	7.05E-03	7.44E-03	7.63E-03	8.11E-03	8.57E-03	7.89E-03	6.86E-03	5.88E-03	5.48E-03	4.67E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.57E-03	9.39E-04	6.73E-04	5.32E-04	4.94E-04	1.49E-03	3.41E-03	5.29E-03	5.80E-03	5.53E-03	5.36E-03	5.16E-03	3.51E-03	3.40E-03	3.52E-03	3.72E-03	3.82E-03	4.06E-03	4.28E-03	3.94E-03	3.43E-03	2.94E-03	2.74E-03	2.34E-03
	Emission in each Box of 1st jet	g/s	1.57E-03	9.39E-04	6.73E-04	5.32E-04	4.94E-04	1.49E-03	3.41E-03	5.29E-03	5.80E-03	5.53E-03	5.36E-03	5.16E-03	3.51E-03	3.40E-03	3.52E-03	3.72E-03	3.82E-03	4.06E-03	4.28E-03	3.94E-03	3.43E-03	2.94E-03	2.74E-03	2.34E-03
	Emission in each Box of 2nd jet	g/s	1.57E-03	9.39E-04	6.73E-04	5.32E-04	4.94E-04	1.49E-03	3.41E-03	5.29E-03	5.80E-03	5.53E-03	5.36E-03	5.16E-03	3.51E-03	3.40E-03	3.52E-03	3.72E-03	3.82E-03	4.06E-03	4.28E-03	3.94E-03	3.43E-03	2.94E-03	2.74E-03	2.34E-03
NO_2 Emission Rate		g/s	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0010***	***0.0019***	***0.0025***	***0.0024***	***0.0023***	***0.0022***	***0.0019***	***0.0018***	***0.0019***	***0.0020***	***0.0020***	***0.0022***	***0.0023***	***0.0022***	***0.0018***	***0.0015***	***0.0014***	***0.0012***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	4.88E-04	3.64E-04	2.61E-04	1.99E-04	1.75E-04	3.13E-04	6.86E-04	1.29E-03	1.68E-03	1.62E-03	1.56E-03	1.48E-03	1.25E-03	1.20E-03	1.26E-03	1.32E-03	1.35E-03	1.44E-03	1.53E-03	1.44E-03	1.22E-03	1.01E-03	9.40E-04	8.18E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.44E-04	1.82E-04	1.30E-04	9.96E-05	8.75E-05	1.56E-04	3.43E-04	6.43E-04	8.41E-04	8.08E-04	7.80E-04	7.42E-04	6.26E-04	6.00E-04	6.30E-04	6.61E-04	6.75E-04	7.19E-04	7.64E-04	7.18E-04	6.11E-04	5.07E-04	4.70E-04	4.09E-04
	Emission in each Box of 1st jet	g/s	2.44E-04	1.82E-04	1.30E-04	9.96E-05	8.75E-05	1.56E-04	3.43E-04	6.43E-04	8.41E-04	8.08E-04	7.80E-04	7.42E-04	6.26E-04	6.00E-04	6.30E-04	6.61E-04	6.75E-04	7.19E-04	7.64E-04	7.18E-04	6.11E-04	5.07E-04	4.70E-04	4.09E-04
	Emission in each Box of 2nd jet	g/s	2.44E-04	1.82E-04	1.30E-04	9.96E-05	8.75E-05	1.56E-04	3.43E-04	6.43E-04	8.41E-04	8.08E-04	7.80E-04	7.42E-04	6.26E-04	6.00E-04	6.30E-04	6.61E-04	6.75E-04	7.19E-04	7.64E-04	7.18E-04	6.11E-04	5.07E-04	4.70E-04	4.09E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1503	0.1122	0.1154	0.1236	0.1318	0.3095	0.3319	0.2255	0.1667	0.1641	0.1658	0.1705	0.1271	0.1288	0.1268	0.1268	0.1264	0.1245	0.1252	0.1219	0.1257	0.1321	0.1318	0.1268
	NO2	g/vehicle/km	0.0230	0.0215	0.0220	0.0227	0.0231	0.0323	0.0332	0.0272	0.0240	0.0237	0.0240	0.0244	0.0225	0.0227	0.0225	0.0224	0.0223	0.0219	0.0222	0.0219	0.0222	0.0226	0.0224	0.0220
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0053***	***0.0032***	***0.0023***	***0.0018***	***0.0016***	***0.0049***	***0.0113***	***0.0182***	***0.0197***	***0.0188***	***0.0175***	***0.0173***	***0.0118***	***0.0112***	***0.0117***	***0.0123***	***0.0128***	***0.0136***	***0.0144***	***0.0135***	***0.0114***	***0.0098***	***0.0092***	***0.0078***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.56E-03	2.14E-03	1.53E-03	1.22E-03	1.09E-03	3.29E-03	7.55E-03	1.21E-02	1.32E-02	1.26E-02	1.17E-02	1.15E-02	7.88E-03	7.47E-03	7.81E-03	8.20E-03	8.52E-03	9.04E-03	9.61E-03	8.99E-03	7.59E-03	6.54E-03	6.10E-03	5.18E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.78E-03	1.07E-03	7.65E-04	6.10E-04	5.45E-04	1.65E-03	3.78E-03	6.07E-03	6.58E-03	6.28E-03	5.84E-03	5.76E-03	3.94E-03	3.73E-03	3.90E-03	4.10E-03	4.26E-03	4.52E-03	4.80E-03	4.50E-03	3.79E-03	3.27E-03	3.05E-03	2.59E-03
	Emission in each Box of 1st jet	g/s	1.78E-03	1.07E-03	7.65E-04	6.10E-04	5.45E-04	1.65E-03	3.78E-03	6.07E-03	6.58E-03	6.28E-03	5.84E-03	5.76E-03	3.94E-03	3.73E-03	3.90E-03	4.10E-03	4.26E-03	4.52E-03	4.80E-03	4.50E-03	3.79E-03	3.27E-03	3.05E-03	2.59E-03
	Emission in each Box of 2nd jet	g/s	1.78E-03	1.07E-03	7.65E-04	6.10E-04	5.45E-04	1.65E-03	3.78E-03	6.07E-03	6.58E-03	6.28E-03	5.84E-03	5.76E-03	3.94E-03	3.73E-03	3.90E-03	4.10E-03	4.26E-03	4.52E-03	4.80E-03	4.50E-03	3.79E-03	3.27E-03	3.05E-03	2.59E-03
NO_2 Emission Rate		g/s	***0.0008***	***0.0006***	***0.0004***	***0.0003***	***0.0003***	***0.0005***	***0.0011***	***0.0022***	***0.0028***	***0.0027***	***0.0025***	***0.0025***	***0.0021***	***0.0020***	***0.0021***	***0.0022***	***0.0022***	***0.0024***	***0.0026***	***0.0024***	***0.0020***	***0.0017***	***0.0016***	***0.0013***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.45E-04	4.10E-04	2.92E-04	2.25E-04	1.91E-04	3.43E-04	7.57E-04	1.46E-03	1.89E-03	1.82E-03	1.69E-03	1.65E-03	1.40E-03	1.31E-03	1.39E-03	1.45E-03	1.50E-03	1.59E-03	1.70E-03	1.62E-03	1.34E-03	1.12E-03	1.04E-03	8.98E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.73E-04	2.05E-04	1.46E-04	1.12E-04	9.56E-05	1.72E-04	3.78E-04	7.32E-04	9.46E-04	9.09E-04	8.46E-04	8.25E-04	6.99E-04	6.57E-04	6.94E-04	7.25E-04	7.50E-04	7.95E-04	8.51E-04	8.08E-04	6.69E-04	5.58E-04	5.19E-04	4.49E-04
	Emission in each Box of 1st jet	g/s	2.73E-04	2.05E-04	1.46E-04	1.12E-04	9.56E-05	1.72E-04	3.78E-04	7.32E-04	9.46E-04	9.09E-04	8.46E-04	8.25E-04	6.99E-04	6.57E-04	6.94E-04	7.25E-04	7.50E-04	7.95E-04	8.51E-04	8.08E-04	6.69E-04	5.58E-04	5.19E-04	4.49E-04
	Emission in each Box of 2nd jet	g/s	2.73E-04	2.05E-04	1.46E-04	1.12E-04	9.56E-05	1.72E-04	3.78E-04	7.32E-04	9.46E-04	9.09E-04	8.46E-04	8.25E-04	6.99E-04	6.57E-04	6.94E-04	7.25E-04	7.50E-04	7.95E-04	8.51E-04	8.08E-04	6.69E-04	5.58E-04	5.19E-04	4.49E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involvec	108P1
Road Located	108
Vehicle EF Adopte	108

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1649	0.1250	0.1289	0.1394	0.1493	0.3490	0.3734	0.2532	0.1880	0.1856	0.1875	0.1917	0.1411	0.1429	0.1408	0.1409	0.1397	0.1400	0.1381	0.1365	0.1398	0.1470	0.1467	0.1419
	NO2	g/vehicle/km	0.0251	0.0236	0.0243	0.0253	0.0258	0.0361	0.0372	0.0303	0.0268	0.0267	0.0270	0.0272	0.0248	0.0249	0.0248	0.0247	0.0244	0.0244	0.0242	0.0244	0.0245	0.0249	0.0248	0.0244
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0059***	***0.0036***	***0.0026***	***0.0021***	***0.0019***	***0.0056***	***0.0127***	***0.0205***	***0.0223***	***0.0213***	***0.0198***	***0.0194***	***0.0131***	***0.0124***	***0.0130***	***0.0137***	***0.0141***	***0.0153***	***0.0159***	***0.0151***	***0.0127***	***0.0109***	***0.0102***	***0.0087***
	2/3 of NO emission rate in 1st 50m Box	g/s	3.90E-03	2.39E-03	1.71E-03	1.38E-03	1.24E-03	3.71E-03	8.50E-03	1.36E-02	1.48E-02	1.42E-02	1.32E-02	1.29E-02	8.75E-03	8.29E-03	8.66E-03	9.11E-03	9.42E-03	1.02E-02	1.06E-02	1.01E-02	8.44E-03	7.27E-03	6.79E-03	5.79E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	1.95E-03	1.19E-03	8.54E-04	6.89E-04	6.18E-04	1.86E-03	4.25E-03	6.82E-03	7.42E-03	7.10E-03	6.61E-03	6.47E-03	4.37E-03	4.14E-03	4.33E-03	4.56E-03	4.71E-03	5.09E-03	5.30E-03	5.03E-03	4.22E-03	3.63E-03	3.40E-03	2.90E-03
	Emission in each Box of 1st jet	g/s	1.95E-03	1.19E-03	8.54E-04	6.89E-04	6.18E-04	1.86E-03	4.25E-03	6.82E-03	7.42E-03	7.10E-03	6.61E-03	6.47E-03	4.37E-03	4.14E-03	4.33E-03	4.56E-03	4.71E-03	5.09E-03	5.30E-03	5.03E-03	4.22E-03	3.63E-03	3.40E-03	2.90E-03
	Emission in each Box of 2nd jet	g/s	1.95E-03	1.19E-03	8.54E-04	6.89E-04	6.18E-04	1.86E-03	4.25E-03	6.82E-03	7.42E-03	7.10E-03	6.61E-03	6.47E-03	4.37E-03	4.14E-03	4.33E-03	4.56E-03	4.71E-03	5.09E-03	5.30E-03	5.03E-03	4.22E-03	3.63E-03	3.40E-03	2.90E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0024***	***0.0032***	***0.0031***	***0.0029***	***0.0028***	***0.0023***	***0.0022***	***0.0023***	***0.0024***	***0.0025***	***0.0027***	***0.0028***	***0.0027***	***0.0022***	***0.0019***	***0.0017***	***0.0015***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	5.94E-04	4.51E-04	3.22E-04	2.50E-04	2.14E-04	3.84E-04	8.46E-04	1.63E-03	2.12E-03	2.04E-03	1.90E-03	1.84E-03	1.54E-03	1.45E-03	1.53E-03	1.60E-03	1.64E-03	1.77E-03	1.86E-03	1.80E-03	1.48E-03	1.23E-03	1.15E-03	9.97E-04
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	2.97E-04	2.26E-04	1.61E-04	1.25E-04	1.07E-04	1.92E-04	4.23E-04	8.16E-04	1.06E-03	1.02E-03	9.50E-04	9.19E-04	7.69E-04	7.23E-04	7.64E-04	7.98E-04	8.22E-04	8.87E-04	9.30E-04	8.98E-04	7.39E-04	6.17E-04	5.73E-04	4.99E-04
	Emission in each Box of 1st jet	g/s	2.97E-04	2.26E-04	1.61E-04	1.25E-04	1.07E-04	1.92E-04	4.23E-04	8.16E-04	1.06E-03	1.02E-03	9.50E-04	9.19E-04	7.69E-04	7.23E-04	7.64E-04	7.98E-04	8.22E-04	8.87E-04	9.30E-04	8.98E-04	7.39E-04	6.17E-04	5.73E-04	4.99E-04
	Emission in each Box of 2nd jet	g/s	2.97E-04	2.26E-04	1.61E-04	1.25E-04	1.07E-04	1.92E-04	4.23E-04	8.16E-04	1.06E-03	1.02E-03	9.50E-04	9.19E-04	7.69E-04	7.23E-04	7.64E-04	7.98E-04	8.22E-04	8.87E-04	9.30E-04	8.98E-04	7.39E-04	6.17E-04	5.73E-04	4.99E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	108A01-108A03
Enclosure Involved	108P1
Road Located	108
Vehicle EF Adopted	108

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1078	870	604	450	377	485	1037	2455	3599	3488	3212	3078	2825	2643	2805	2946	3071	3311	3498	3360	2752	2254	2110	1861
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1740	0.1310	0.1353	0.1455	0.1577	0.3653	0.3896	0.2640	0.1962	0.1934	0.1948	0.1995	0.1466	0.1485	0.1467	0.1466	0.1453	0.1452	0.1447	0.1412	0.1451	0.1522	0.1540	0.1489
	NO2	g/vehicle/km	0.0264	0.0246	0.0253	0.0262	0.0270	0.0377	0.0387	0.0315	0.0279	0.0277	0.0279	0.0283	0.0257	0.0258	0.0258	0.0256	0.0252	0.0253	0.0253	0.0251	0.0253	0.0257	0.0258	0.0255
	RSP	g/vehicle/km	0.0121	0.0089	0.0093	0.0099	0.0106	0.0254	0.0272	0.0183	0.0135	0.0134	0.0137	0.0140	0.0103	0.0105	0.0103	0.0104	0.0102	0.0102	0.0101	0.0098	0.0102	0.0107	0.0107	0.0104
	FSP	g/vehicle/km	0.0111	0.0082	0.0085	0.0091	0.0097	0.0233	0.0249	0.0168	0.0124	0.0122	0.0126	0.0128	0.0095	0.0096	0.0094	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0098	0.0098	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50	118.50
	Number of 1st 50m Box	#	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Number of 2nd 50m Box	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NO Emission Rate		g/s	***0.0062***	***0.0038***	***0.0027***	***0.0022***	***0.0020***	***0.0058***	***0.0133***	***0.0213***	***0.0232***	***0.0222***	***0.0206***	***0.0202***	***0.0136***	***0.0129***	***0.0135***	***0.0142***	***0.0147***	***0.0158***	***0.0167***	***0.0156***	***0.0131***	***0.0113***	***0.0107***	***0.0091***
	2/3 of NO emission rate in 1st 50m Box	g/s	4.12E-03	2.50E-03	1.79E-03	1.44E-03	1.30E-03	3.89E-03	8.87E-03	1.42E-02	1.55E-02	1.48E-02	1.37E-02	1.35E-02	9.09E-03	8.61E-03	9.03E-03	9.48E-03	9.79E-03	1.05E-02	1.11E-02	1.04E-02	8.76E-03	7.53E-03	7.13E-03	6.08E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.06E-03	1.25E-03	8.96E-04	7.18E-04	6.52E-04	1.94E-03	4.43E-03	7.11E-03	7.75E-03	7.40E-03	6.86E-03	6.74E-03	4.55E-03	4.31E-03	4.51E-03	4.74E-03	4.89E-03	5.27E-03	5.55E-03	5.21E-03	4.38E-03	3.76E-03	3.56E-03	3.04E-03
	Emission in each Box of 1st jet	g/s	2.06E-03	1.25E-03	8.96E-04	7.18E-04	6.52E-04	1.94E-03	4.43E-03	7.11E-03	7.75E-03	7.40E-03	6.86E-03	6.74E-03	4.55E-03	4.31E-03	4.51E-03	4.74E-03	4.89E-03	5.27E-03	5.55E-03	5.21E-03	4.38E-03	3.76E-03	3.56E-03	3.04E-03
	Emission in each Box of 2nd jet	g/s	2.06E-03	1.25E-03	8.96E-04	7.18E-04	6.52E-04	1.94E-03	4.43E-03	7.11E-03	7.75E-03	7.40E-03	6.86E-03	6.74E-03	4.55E-03	4.31E-03	4.51E-03	4.74E-03	4.89E-03	5.27E-03	5.55E-03	5.21E-03	4.38E-03	3.76E-03	3.56E-03	3.04E-03
NO_2 Emission Rate		g/s	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0003***	***0.0006***	***0.0013***	***0.0025***	***0.0033***	***0.0032***	***0.0030***	***0.0029***	***0.0024***	***0.0022***	***0.0024***	***0.0025***	***0.0025***	***0.0028***	***0.0029***	***0.0028***	***0.0023***	***0.0019***	***0.0018***	***0.0016***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	6.24E-04	4.70E-04	3.36E-04	2.59E-04	2.24E-04	4.01E-04	8.80E-04	1.70E-03	2.20E-03	2.12E-03	1.97E-03	1.91E-03	1.59E-03	1.50E-03	1.59E-03	1.65E-03	1.70E-03	1.83E-03	1.94E-03	1.85E-03	1.53E-03	1.27E-03	1.20E-03	1.04E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	3.12E-04	2.35E-04	1.68E-04	1.29E-04	1.12E-04	2.00E-04	4.40E-04	8.48E-04	1.10E-03	1.06E-03	9.85E-04	9.55E-04	7.96E-04	7.49E-04	7.94E-04	8.27E-04	8.50E-04	9.17E-04	9.70E-04	9.26E-04	7.64E-04	6.37E-04	5.98E-04	5.20E-04
	Emission in each Box of 1st jet	g/s	3.12E-04	2.35E-04	1.68E-04	1.29E-04	1.12E-04	2.00E-04	4.40E-04	8.48E-04	1.10E-03	1.06E-03	9.85E-04	9.55E-04	7.96E-04	7.49E-04	7.94E-04	8.27E-04	8.50E-04	9.17E-04	9.70E-04	9.26E-04	7.64E-04	6.37E-04	5.98E-04	5.20E-04
	Emission in each Box of 2nd jet	g/s	3.12E-04	2.35E-04	1.68E-04	1.29E-04	1.12E-04	2.00E-04	4.40E-04	8.48E-04	1.10E-03	1.06E-03	9.85E-04	9.55E-04	7.96E-04	7.49E-04	7.94E-04	8.27E-04	8.50E-04	9.17E-04	9.70E-04	9.26E-04	7.64E-04	6.37E-04	5.98E-04	5.20E-04
RSP Emission Rate		g/s	***4.31E-04***	***2.56E-04***	***1.84E-04***	***1.47E-04***	***1.32E-04***	***4.05E-04***	***9.27E-04***	***1.48E-03***	***1.60E-03***	***1.53E-03***	***1.45E-03***	***1.41E-03***	***9.61E-04***	***9.11E-04***	***9.52E-04***	***1.01E-03***	***1.03E-03***	***1.11E-03***	***1.16E-03***	***1.09E-03***	***9.20E-04***	***7.93E-04***	***7.44E-04***	***6.35E-04***
	2/3 of RSP emission rate in 1st 50m Box	g/s	2.87E-04	1.71E-04	1.23E-04	9.80E-05	8.81E-05	2.70E-04	6.18E-04	9.86E-04	1.07E-03	1.02E-03	9.66E-04	9.43E-04	6.41E-04	6.08E-04	6.35E-04	6.71E-04	6.88E-04	7.40E-04	7.74E-04	7.26E-04	6.13E-04	5.28E-04	4.96E-04	4.23E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 1st jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	8.54E-05	6.13E-05	4.90E-05	4.40E-05	1.35E-04	3.09E-04	4.93E-04	5.34E-04	5.11E-04	4.83E-04	4.71E-04	3.20E-04	3.04E-04	3.17E-04	3.35E-04	3.44E-04	3.70E-04	3.87E-04	3.63E-04	3.07E-04	2.64E-04	2.48E-04	2.12E-04
FSP Emission Rate		g/s	***3.94E-04***	***2.34E-04***	***1.68E-04***	***1.34E-04***	***1.21E-04***	***3.72E-04***	***8.51E-04***	***1.36E-03***	***1.47E-03***	***1.40E-03***	***1.33E-03***	***1.30E-03***	***8.79E-04***	***8.34E-04***	***8.71E-04***	***9.20E-04***	***9.44E-04***	***1.02E-03***	***1.06E-03***	***9.96E-04***	***8.41E-04***	***7.25E-04***	***6.81E-04***	***5.81E-04***
	2/3 of FSP emission rate in 1st 50m Box	g/s	2.63E-04	1.56E-04	1.12E-04	8.97E-05	8.06E-05	2.48E-04	5.68E-04	9.04E-04	9.78E-04	9.36E-04	8.85E-04	8.64E-04	5.86E-04	5.56E-04	5.81E-04	6.13E-04	6.29E-04	6.77E-04	7.08E-04	6.64E-04	5.61E-04	4.84E-04	4.54E-04	3.87E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 1st jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
	Emission in each Box of 2nd jet	g/s	1.31E-04	7.80E-05	5.61E-05	4.48E-05	4.03E-05	1.24E-04	2.84E-04	4.52E-04	4.89E-04	4.68E-04	4.43E-04	4.32E-04	2.93E-04	2.78E-04	2.90E-04	3.07E-04	3.15E-04	3.39E-04	3.54E-04	3.32E-04	2.80E-04	2.42E-04	2.27E-04	1.94E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) The distance to te next portal is less than 100m (i.e. 54m). It was assumed that 2/3 of the total emission from the portal is dispersed in the first 36m and 1/3 of the total emission is dispersed in the remaining 18m

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1623	0.1223	0.1253	0.1392	0.1488	0.3491	0.3764	0.2487	0.1852	0.1827	0.1851	0.1879	0.1528	0.1548	0.1512	0.1519	0.1502	0.1504	0.1488	0.1446	0.1486	0.1584	0.1593	0.1531
	NO2	g/vehicle/km	0.0239	0.0223	0.0227	0.0239	0.0243	0.0353	0.0366	0.0289	0.0256	0.0254	0.0260	0.0261	0.0255	0.0256	0.0252	0.0253	0.0247	0.0246	0.0245	0.0243	0.0245	0.0251	0.0250	0.0246
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0117***	***0.0071***	***0.0051***	***0.0042***	***0.0038***	***0.0112***	***0.0258***	***0.0407***	***0.0447***	***0.0427***	***0.0399***	***0.0388***	***0.0276***	***0.0262***	***0.0272***	***0.0286***	***0.0295***	***0.0318***	***0.0332***	***0.0310***	***0.0261***	***0.0228***	***0.0215***	***0.0182***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.83E-03	4.77E-03	3.38E-03	2.81E-03	2.51E-03	7.46E-03	1.72E-02	2.71E-02	2.98E-02	2.85E-02	2.66E-02	2.59E-02	1.84E-02	1.75E-02	1.81E-02	1.91E-02	1.96E-02	2.12E-02	2.22E-02	2.07E-02	1.74E-02	1.52E-02	1.43E-02	1.21E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.91E-03	2.38E-03	1.69E-03	1.40E-03	1.25E-03	3.73E-03	8.60E-03	1.36E-02	1.49E-02	1.42E-02	1.33E-02	1.29E-02	9.21E-03	8.74E-03	9.06E-03	9.55E-03	9.82E-03	1.06E-02	1.11E-02	1.03E-02	8.72E-03	7.61E-03	7.15E-03	6.07E-03
	Emission in each Box of 1st jet	g/s	2.61E-03	1.59E-03	1.13E-03	9.36E-04	8.37E-04	2.49E-03	5.73E-03	9.05E-03	9.92E-03	9.49E-03	8.86E-03	8.63E-03	6.14E-03	5.83E-03	6.04E-03	6.37E-03	6.55E-03	7.06E-03	7.39E-03	6.89E-03	5.81E-03	5.08E-03	4.77E-03	4.05E-03
	Emission in each Box of 2nd jet	g/s	1.30E-03	7.94E-04	5.63E-04	4.68E-04	4.18E-04	1.24E-03	2.87E-03	4.52E-03	4.96E-03	4.75E-03	4.43E-03	4.31E-03	3.07E-03	2.91E-03	3.02E-03	3.18E-03	3.27E-03	3.53E-03	3.69E-03	3.45E-03	2.91E-03	2.54E-03	2.38E-03	2.02E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0013***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0025***	***0.0047***	***0.0062***	***0.0059***	***0.0056***	***0.0054***	***0.0046***	***0.0043***	***0.0045***	***0.0048***	***0.0049***	***0.0052***	***0.0055***	***0.0052***	***0.0043***	***0.0036***	***0.0034***	***0.0029***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.15E-03	8.69E-04	6.13E-04	4.82E-04	4.09E-04	7.55E-04	1.67E-03	3.15E-03	4.11E-03	3.96E-03	3.73E-03	3.59E-03	3.07E-03	2.89E-03	3.02E-03	3.18E-03	3.23E-03	3.47E-03	3.65E-03	3.47E-03	2.88E-03	2.41E-03	2.25E-03	1.95E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.77E-04	4.34E-04	3.06E-04	2.41E-04	2.04E-04	3.77E-04	8.36E-04	1.58E-03	2.06E-03	1.98E-03	1.86E-03	1.80E-03	1.54E-03	1.44E-03	1.51E-03	1.59E-03	1.62E-03	1.73E-03	1.83E-03	1.74E-03	1.44E-03	1.21E-03	1.12E-03	9.75E-04
	Emission in each Box of 1st jet	g/s	3.84E-04	2.90E-04	2.04E-04	1.61E-04	1.36E-04	2.52E-04	5.57E-04	1.05E-03	1.37E-03	1.32E-03	1.24E-03	1.20E-03	1.02E-03	9.63E-04	1.01E-03	1.06E-03	1.08E-03	1.16E-03	1.22E-03	1.16E-03	9.60E-04	8.04E-04	7.50E-04	6.50E-04
	Emission in each Box of 2nd jet	g/s	1.92E-04	1.45E-04	1.02E-04	8.04E-05	6.81E-05	1.26E-04	2.79E-04	5.25E-04	6.85E-04	6.61E-04	6.21E-04	5.99E-04	5.12E-04	4.81E-04	5.03E-04	5.30E-04	5.39E-04	5.78E-04	6.08E-04	5.79E-04	4.80E-04	4.02E-04	3.75E-04	3.25E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1515	0.1127	0.1151	0.1295	0.1384	0.3264	0.3488	0.2327	0.1712	0.1667	0.1702	0.1728	0.1404	0.1434	0.1412	0.1405	0.1387	0.1396	0.1379	0.1351	0.1388	0.1483	0.1474	0.1416
	NO2	g/vehicle/km	0.0225	0.0208	0.0212	0.0225	0.0228	0.0332	0.0341	0.0271	0.0238	0.0235	0.0241	0.0242	0.0236	0.0239	0.0237	0.0236	0.0231	0.0231	0.0230	0.0229	0.0231	0.0236	0.0234	0.0230
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0110***	***0.0066***	***0.0047***	***0.0039***	***0.0035***	***0.0105***	***0.0239***	***0.0381***	***0.0413***	***0.0390***	***0.0367***	***0.0357***	***0.0254***	***0.0243***	***0.0254***	***0.0265***	***0.0272***	***0.0295***	***0.0308***	***0.0290***	***0.0244***	***0.0214***	***0.0199***	***0.0168***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.31E-03	4.39E-03	3.10E-03	2.61E-03	2.33E-03	6.97E-03	1.59E-02	2.54E-02	2.75E-02	2.60E-02	2.45E-02	2.38E-02	1.69E-02	1.62E-02	1.69E-02	1.77E-02	1.81E-02	1.97E-02	2.05E-02	1.93E-02	1.63E-02	1.43E-02	1.32E-02	1.12E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.65E-03	2.20E-03	1.55E-03	1.31E-03	1.17E-03	3.49E-03	7.97E-03	1.27E-02	1.38E-02	1.30E-02	1.22E-02	1.19E-02	8.46E-03	8.10E-03	8.46E-03	8.83E-03	9.07E-03	9.83E-03	1.03E-02	9.66E-03	8.14E-03	7.13E-03	6.62E-03	5.61E-03
	Emission in each Box of 1st jet	g/s	2.44E-03	1.46E-03	1.03E-03	8.71E-04	7.78E-04	2.32E-03	5.31E-03	8.46E-03	9.18E-03	8.66E-03	8.15E-03	7.93E-03	5.64E-03	5.40E-03	5.64E-03	5.89E-03	6.05E-03	6.55E-03	6.85E-03	6.44E-03	5.43E-03	4.75E-03	4.41E-03	3.74E-03
	Emission in each Box of 2nd jet	g/s	1.22E-03	7.32E-04	5.17E-04	4.36E-04	3.89E-04	1.16E-03	2.66E-03	4.23E-03	4.59E-03	4.33E-03	4.08E-03	3.97E-03	2.82E-03	2.70E-03	2.82E-03	2.94E-03	3.02E-03	3.28E-03	3.42E-03	3.22E-03	2.71E-03	2.38E-03	2.21E-03	1.87E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0023***	***0.0044***	***0.0058***	***0.0055***	***0.0052***	***0.0050***	***0.0043***	***0.0040***	***0.0043***	***0.0044***	***0.0045***	***0.0049***	***0.0051***	***0.0049***	***0.0041***	***0.0034***	***0.0032***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.08E-03	8.12E-04	5.72E-04	4.54E-04	3.85E-04	7.09E-04	1.56E-03	2.96E-03	3.83E-03	3.66E-03	3.46E-03	3.33E-03	2.85E-03	2.70E-03	2.84E-03	2.96E-03	3.01E-03	3.25E-03	3.42E-03	3.27E-03	2.71E-03	2.27E-03	2.10E-03	1.82E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.42E-04	4.06E-04	2.86E-04	2.27E-04	1.92E-04	3.55E-04	7.79E-04	1.48E-03	1.92E-03	1.83E-03	1.73E-03	1.67E-03	1.42E-03	1.35E-03	1.42E-03	1.48E-03	1.51E-03	1.62E-03	1.71E-03	1.64E-03	1.35E-03	1.14E-03	1.05E-03	9.11E-04
	Emission in each Box of 1st jet	g/s	3.62E-04	2.71E-04	1.91E-04	1.51E-04	1.28E-04	2.36E-04	5.19E-04	9.87E-04	1.28E-03	1.22E-03	1.15E-03	1.11E-03	9.49E-04	8.99E-04	9.47E-04	9.87E-04	1.00E-03	1.08E-03	1.14E-03	1.09E-03	9.03E-04	7.58E-04	7.01E-04	6.07E-04
	Emission in each Box of 2nd jet	g/s	1.81E-04	1.35E-04	9.53E-05	7.57E-05	6.41E-05	1.18E-04	2.60E-04	4.94E-04	6.39E-04	6.10E-04	5.76E-04	5.55E-04	4.75E-04	4.49E-04	4.74E-04	4.94E-04	5.02E-04	5.41E-04	5.70E-04	5.46E-04	4.52E-04	3.79E-04	3.50E-04	3.04E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1427	0.1061	0.1085	0.1202	0.1286	0.3057	0.3276	0.2187	0.1611	0.1584	0.1599	0.1647	0.1337	0.1345	0.1324	0.1334	0.1303	0.1317	0.1311	0.1272	0.1302	0.1392	0.1383	0.1331
	NO2	g/vehicle/km	0.0214	0.0198	0.0202	0.0212	0.0215	0.0313	0.0322	0.0257	0.0226	0.0224	0.0228	0.0232	0.0226	0.0225	0.0223	0.0225	0.0217	0.0219	0.0219	0.0217	0.0218	0.0223	0.0221	0.0217
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0103***	***0.0062***	***0.0044***	***0.0036***	***0.0033***	***0.0098***	***0.0225***	***0.0358***	***0.0388***	***0.0371***	***0.0345***	***0.0340***	***0.0242***	***0.0228***	***0.0238***	***0.0251***	***0.0256***	***0.0278***	***0.0293***	***0.0273***	***0.0229***	***0.0201***	***0.0186***	***0.0158***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.88E-03	4.13E-03	2.92E-03	2.43E-03	2.17E-03	6.53E-03	1.50E-02	2.39E-02	2.59E-02	2.47E-02	2.30E-02	2.27E-02	1.61E-02	1.52E-02	1.59E-02	1.68E-02	1.70E-02	1.86E-02	1.95E-02	1.82E-02	1.53E-02	1.34E-02	1.24E-02	1.06E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.44E-03	2.07E-03	1.46E-03	1.21E-03	1.08E-03	3.27E-03	7.49E-03	1.19E-02	1.29E-02	1.24E-02	1.15E-02	1.13E-02	8.06E-03	7.59E-03	7.93E-03	8.38E-03	8.52E-03	9.28E-03	9.76E-03	9.09E-03	7.63E-03	6.69E-03	6.21E-03	5.28E-03
	Emission in each Box of 1st jet	g/s	2.29E-03	1.38E-03	9.75E-04	8.09E-04	7.23E-04	2.18E-03	4.99E-03	7.96E-03	8.63E-03	8.23E-03	7.66E-03	7.56E-03	5.38E-03	5.06E-03	5.29E-03	5.59E-03	5.68E-03	6.18E-03	6.51E-03	6.06E-03	5.09E-03	4.46E-03	4.14E-03	3.52E-03
	Emission in each Box of 2nd jet	g/s	1.15E-03	6.89E-04	4.87E-04	4.04E-04	3.61E-04	1.09E-03	2.50E-03	3.98E-03	4.32E-03	4.12E-03	3.83E-03	3.78E-03	2.69E-03	2.53E-03	2.64E-03	2.79E-03	2.84E-03	3.09E-03	3.25E-03	3.03E-03	2.54E-03	2.23E-03	2.07E-03	1.76E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0012***	***0.0008***	***0.0006***	***0.0005***	***0.0010***	***0.0022***	***0.0042***	***0.0055***	***0.0052***	***0.0049***	***0.0048***	***0.0041***	***0.0038***	***0.0040***	***0.0042***	***0.0043***	***0.0046***	***0.0049***	***0.0047***	***0.0038***	***0.0032***	***0.0030***	***0.0026***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.03E-03	7.74E-04	5.46E-04	4.28E-04	3.63E-04	6.69E-04	1.47E-03	2.81E-03	3.64E-03	3.49E-03	3.27E-03	3.19E-03	2.73E-03	2.54E-03	2.67E-03	2.83E-03	2.84E-03	3.08E-03	3.27E-03	3.11E-03	2.56E-03	2.15E-03	1.98E-03	1.72E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.16E-04	3.87E-04	2.73E-04	2.14E-04	1.81E-04	3.35E-04	7.36E-04	1.40E-03	1.82E-03	1.75E-03	1.63E-03	1.59E-03	1.36E-03	1.27E-03	1.34E-03	1.41E-03	1.42E-03	1.54E-03	1.63E-03	1.55E-03	1.28E-03	1.07E-03	9.91E-04	8.61E-04
	Emission in each Box of 1st jet	g/s	3.44E-04	2.58E-04	1.82E-04	1.43E-04	1.21E-04	2.23E-04	4.91E-04	9.35E-04	1.21E-03	1.16E-03	1.09E-03	1.06E-03	9.09E-04	8.46E-04	8.91E-04	9.43E-04	9.47E-04	1.03E-03	1.09E-03	1.04E-03	8.52E-04	7.15E-04	6.61E-04	5.74E-04
	Emission in each Box of 2nd jet	g/s	1.72E-04	1.29E-04	9.09E-05	7.14E-05	6.04E-05	1.12E-04	2.45E-04	4.68E-04	6.06E-04	5.82E-04	5.45E-04	5.32E-04	4.55E-04	4.23E-04	4.46E-04	4.71E-04	4.74E-04	5.14E-04	5.45E-04	5.18E-04	4.26E-04	3.58E-04	3.30E-04	2.87E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1339	0.0992	0.1010	0.1148	0.1228	0.2940	0.3152	0.2082	0.1532	0.1508	0.1522	0.1564	0.1269	0.1299	0.1279	0.1265	0.1261	0.1252	0.1246	0.1202	0.1233	0.1340	0.1326	0.1272
	NO2	g/vehicle/km	0.0201	0.0187	0.0190	0.0204	0.0206	0.0302	0.0310	0.0245	0.0216	0.0214	0.0217	0.0220	0.0215	0.0218	0.0216	0.0214	0.0211	0.0209	0.0209	0.0206	0.0208	0.0216	0.0213	0.0208
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0097***	***0.0058***	***0.0041***	***0.0035***	***0.0031***	***0.0094***	***0.0216***	***0.0341***	***0.0370***	***0.0353***	***0.0328***	***0.0323***	***0.0230***	***0.0220***	***0.0230***	***0.0239***	***0.0247***	***0.0264***	***0.0278***	***0.0258***	***0.0217***	***0.0193***	***0.0179***	***0.0151***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.46E-03	3.87E-03	2.72E-03	2.32E-03	2.07E-03	6.28E-03	1.44E-02	2.27E-02	2.46E-02	2.35E-02	2.19E-02	2.15E-02	1.53E-02	1.47E-02	1.53E-02	1.59E-02	1.65E-02	1.76E-02	1.86E-02	1.72E-02	1.45E-02	1.29E-02	1.19E-02	1.01E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.23E-03	1.93E-03	1.36E-03	1.16E-03	1.04E-03	3.14E-03	7.20E-03	1.14E-02	1.23E-02	1.18E-02	1.09E-02	1.08E-02	7.65E-03	7.33E-03	7.66E-03	7.95E-03	8.25E-03	8.82E-03	9.28E-03	8.59E-03	7.23E-03	6.44E-03	5.95E-03	5.04E-03
	Emission in each Box of 1st jet	g/s	2.15E-03	1.29E-03	9.07E-04	7.72E-04	6.90E-04	2.09E-03	4.80E-03	7.57E-03	8.21E-03	7.84E-03	7.29E-03	7.18E-03	5.10E-03	4.89E-03	5.11E-03	5.30E-03	5.50E-03	5.88E-03	6.18E-03	5.73E-03	4.82E-03	4.30E-03	3.97E-03	3.36E-03
	Emission in each Box of 2nd jet	g/s	1.08E-03	6.44E-04	4.54E-04	3.86E-04	3.45E-04	1.05E-03	2.40E-03	3.79E-03	4.11E-03	3.92E-03	3.64E-03	3.59E-03	2.55E-03	2.44E-03	2.55E-03	2.65E-03	2.75E-03	2.94E-03	3.09E-03	2.86E-03	2.41E-03	2.15E-03	1.98E-03	1.68E-03
NO_2 Emission Rate		g/s	***0.0015***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0010***	***0.0021***	***0.0040***	***0.0052***	***0.0050***	***0.0047***	***0.0045***	***0.0039***	***0.0037***	***0.0039***	***0.0040***	***0.0041***	***0.0044***	***0.0047***	***0.0044***	***0.0037***	***0.0031***	***0.0029***	***0.0025***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.72E-04	7.29E-04	5.12E-04	4.11E-04	3.48E-04	6.45E-04	1.42E-03	2.68E-03	3.47E-03	3.33E-03	3.11E-03	3.03E-03	2.59E-03	2.46E-03	2.59E-03	2.69E-03	2.76E-03	2.94E-03	3.11E-03	2.95E-03	2.44E-03	2.07E-03	1.91E-03	1.65E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.86E-04	3.64E-04	2.56E-04	2.05E-04	1.74E-04	3.22E-04	7.09E-04	1.34E-03	1.73E-03	1.67E-03	1.56E-03	1.52E-03	1.30E-03	1.23E-03	1.29E-03	1.34E-03	1.38E-03	1.47E-03	1.56E-03	1.47E-03	1.22E-03	1.04E-03	9.55E-04	8.26E-04
	Emission in each Box of 1st jet	g/s	3.24E-04	2.43E-04	1.71E-04	1.37E-04	1.16E-04	2.15E-04	4.73E-04	8.92E-04	1.16E-03	1.11E-03	1.04E-03	1.01E-03	8.65E-04	8.19E-04	8.63E-04	8.96E-04	9.20E-04	9.79E-04	1.04E-03	9.83E-04	8.12E-04	6.91E-04	6.36E-04	5.51E-04
	Emission in each Box of 2nd jet	g/s	1.62E-04	1.21E-04	8.53E-05	6.85E-05	5.80E-05	1.07E-04	2.36E-04	4.46E-04	5.78E-04	5.55E-04	5.19E-04	5.05E-04	4.32E-04	4.09E-04	4.32E-04	4.48E-04	4.60E-04	4.90E-04	5.19E-04	4.91E-04	4.06E-04	3.46E-04	3.18E-04	2.75E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section: 109A01-109A05
Enclosure Involved: 109P1
Road Located: 109
Vehicle EF Adopted: 109

		Unit																									
Month		-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Hour		time	**0000-0100**	**0100-0200**	**0200-0300**	**0300-0400**	**0400-0500**	**0500-0600**	**0600-0700**	**0700-0800**	**0800-0900**	**0900-1000**	**1000-1100**	**1100-1200**	**1200-1300**	**1300-1400**	**1400-1500**	**1500-1600**	**1600-1700**	**1700-1800**	**1800-1900**	**1900-2000**	**2000-2100**	**2100-2200**	**2200-2300**	**2300-2400**
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1201	0.0880	0.0899	0.0995	0.1066	0.2564	0.2716	0.1807	0.1345	0.1317	0.1352	0.1387	0.1133	0.1154	0.1144	0.1127	0.1120	0.1128	0.1093	0.1075	0.1100	0.1164	0.1160	0.1111
	NO2	g/vehicle/km	0.0183	0.0169	0.0172	0.0179	0.0182	0.0265	0.0270	0.0215	0.0191	0.0189	0.0194	0.0197	0.0194	0.0195	0.0195	0.0192	0.0189	0.0189	0.0186	0.0186	0.0187	0.0189	0.0188	0.0184
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0087***	***0.0051***	***0.0036***	***0.0030***	***0.0027***	***0.0082***	***0.0186***	***0.0296***	***0.0324***	***0.0308***	***0.0291***	***0.0287***	***0.0205***	***0.0195***	***0.0206***	***0.0212***	***0.0220***	***0.0238***	***0.0244***	***0.0231***	***0.0194***	***0.0168***	***0.0156***	***0.0132***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.79E-03	3.43E-03	2.42E-03	2.01E-03	1.80E-03	5.48E-03	1.24E-02	1.97E-02	2.16E-02	2.05E-02	1.94E-02	1.91E-02	1.37E-02	1.30E-02	1.37E-02	1.42E-02	1.46E-02	1.59E-02	1.63E-02	1.54E-02	1.29E-02	1.12E-02	1.04E-02	8.80E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.90E-03	1.72E-03	1.21E-03	1.00E-03	8.98E-04	2.74E-03	6.21E-03	9.86E-03	1.08E-02	1.03E-02	9.71E-03	9.55E-03	6.83E-03	6.52E-03	6.85E-03	7.08E-03	7.32E-03	7.94E-03	8.14E-03	7.68E-03	6.45E-03	5.59E-03	5.21E-03	4.40E-03
	Emission in each Box of 1st jet	g/s	1.93E-03	1.14E-03	8.07E-04	6.69E-04	5.99E-04	1.83E-03	4.14E-03	6.57E-03	7.21E-03	6.84E-03	6.47E-03	6.37E-03	4.56E-03	4.34E-03	4.57E-03	4.72E-03	4.88E-03	5.30E-03	5.43E-03	5.12E-03	4.30E-03	3.73E-03	3.47E-03	2.93E-03
	Emission in each Box of 2nd jet	g/s	9.66E-04	5.72E-04	4.04E-04	3.35E-04	2.99E-04	9.13E-04	2.07E-03	3.29E-03	3.60E-03	3.42E-03	3.24E-03	3.18E-03	2.28E-03	2.17E-03	2.28E-03	2.36E-03	2.44E-03	2.65E-03	2.71E-03	2.56E-03	2.15E-03	1.86E-03	1.74E-03	1.47E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0035***	***0.0046***	***0.0044***	***0.0042***	***0.0041***	***0.0035***	***0.0033***	***0.0035***	***0.0036***	***0.0037***	***0.0040***	***0.0041***	***0.0040***	***0.0033***	***0.0027***	***0.0025***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.81E-04	6.57E-04	4.64E-04	3.62E-04	3.06E-04	5.67E-04	1.23E-03	2.34E-03	3.07E-03	2.94E-03	2.79E-03	2.71E-03	2.33E-03	2.20E-03	2.34E-03	2.41E-03	2.47E-03	2.67E-03	2.77E-03	2.66E-03	2.20E-03	1.82E-03	1.68E-03	1.46E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.40E-04	3.29E-04	2.32E-04	1.81E-04	1.53E-04	2.83E-04	6.16E-04	1.17E-03	1.54E-03	1.47E-03	1.40E-03	1.36E-03	1.17E-03	1.10E-03	1.17E-03	1.21E-03	1.24E-03	1.33E-03	1.38E-03	1.33E-03	1.10E-03	9.09E-04	8.42E-04	7.28E-04
	Emission in each Box of 1st jet	g/s	2.94E-04	2.19E-04	1.55E-04	1.21E-04	1.02E-04	1.89E-04	4.11E-04	7.81E-04	1.02E-03	9.80E-04	9.30E-04	9.04E-04	7.78E-04	7.34E-04	7.79E-04	8.05E-04	8.25E-04	8.90E-04	9.22E-04	8.88E-04	7.33E-04	6.06E-04	5.62E-04	4.85E-04
	Emission in each Box of 2nd jet	g/s	1.47E-04	1.10E-04	7.73E-05	6.03E-05	5.11E-05	9.44E-05	2.05E-04	3.91E-04	5.12E-04	4.90E-04	4.65E-04	4.52E-04	3.89E-04	3.67E-04	3.90E-04	4.02E-04	4.12E-04	4.45E-04	4.61E-04	4.44E-04	3.66E-04	3.03E-04	2.81E-04	2.43E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1159	0.0854	0.0895	0.0989	0.1053	0.2536	0.2653	0.1786	0.1315	0.1314	0.1308	0.1342	0.1088	0.1115	0.1091	0.1090	0.1101	0.1099	0.1073	0.1062	0.1088	0.1156	0.1146	0.1104
	NO2	g/vehicle/km	0.0176	0.0163	0.0171	0.0179	0.0180	0.0262	0.0264	0.0212	0.0187	0.0188	0.0188	0.0191	0.0186	0.0190	0.0186	0.0186	0.0186	0.0185	0.0183	0.0184	0.0185	0.0188	0.0186	0.0183
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0084***	***0.0050***	***0.0036***	***0.0030***	***0.0027***	***0.0081***	***0.0182***	***0.0292***	***0.0317***	***0.0307***	***0.0282***	***0.0277***	***0.0197***	***0.0189***	***0.0196***	***0.0205***	***0.0216***	***0.0232***	***0.0240***	***0.0228***	***0.0191***	***0.0167***	***0.0154***	***0.0131***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.59E-03	3.33E-03	2.41E-03	2.00E-03	1.78E-03	5.42E-03	1.21E-02	1.95E-02	2.11E-02	2.05E-02	1.88E-02	1.85E-02	1.31E-02	1.26E-02	1.31E-02	1.37E-02	1.44E-02	1.55E-02	1.60E-02	1.52E-02	1.28E-02	1.11E-02	1.03E-02	8.75E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.80E-03	1.66E-03	1.21E-03	9.98E-04	8.88E-04	2.71E-03	6.06E-03	9.74E-03	1.06E-02	1.02E-02	9.40E-03	9.24E-03	6.56E-03	6.30E-03	6.53E-03	6.85E-03	7.20E-03	7.74E-03	7.99E-03	7.60E-03	6.38E-03	5.56E-03	5.15E-03	4.38E-03
	Emission in each Box of 1st jet	g/s	1.86E-03	1.11E-03	8.04E-04	6.65E-04	5.92E-04	1.81E-03	4.04E-03	6.49E-03	7.05E-03	6.83E-03	6.27E-03	6.16E-03	4.37E-03	4.20E-03	4.36E-03	4.57E-03	4.80E-03	5.16E-03	5.32E-03	5.06E-03	4.25E-03	3.71E-03	3.43E-03	2.92E-03
	Emission in each Box of 2nd jet	g/s	9.32E-04	5.55E-04	4.02E-04	3.33E-04	2.96E-04	9.03E-04	2.02E-03	3.25E-03	3.52E-03	3.41E-03	3.13E-03	3.08E-03	2.19E-03	2.10E-03	2.18E-03	2.28E-03	2.40E-03	2.58E-03	2.66E-03	2.53E-03	2.13E-03	1.85E-03	1.72E-03	1.46E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0035***	***0.0045***	***0.0044***	***0.0041***	***0.0039***	***0.0034***	***0.0032***	***0.0034***	***0.0035***	***0.0037***	***0.0039***	***0.0041***	***0.0040***	***0.0033***	***0.0027***	***0.0025***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.50E-04	6.37E-04	4.60E-04	3.60E-04	3.03E-04	5.61E-04	1.21E-03	2.31E-03	3.01E-03	2.94E-03	2.70E-03	2.63E-03	2.25E-03	2.14E-03	2.23E-03	2.34E-03	2.44E-03	2.61E-03	2.72E-03	2.63E-03	2.17E-03	1.81E-03	1.67E-03	1.45E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.25E-04	3.19E-04	2.30E-04	1.80E-04	1.52E-04	2.80E-04	6.03E-04	1.16E-03	1.51E-03	1.47E-03	1.35E-03	1.31E-03	1.12E-03	1.07E-03	1.12E-03	1.17E-03	1.22E-03	1.31E-03	1.36E-03	1.32E-03	1.08E-03	9.05E-04	8.33E-04	7.24E-04
	Emission in each Box of 1st jet	g/s	2.83E-04	2.12E-04	1.53E-04	1.20E-04	1.01E-04	1.87E-04	4.02E-04	7.71E-04	1.00E-03	9.79E-04	9.01E-04	8.76E-04	7.49E-04	7.14E-04	7.45E-04	7.79E-04	8.13E-04	8.70E-04	9.06E-04	8.78E-04	7.22E-04	6.03E-04	5.56E-04	4.82E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	1.06E-04	7.66E-05	6.00E-05	5.05E-05	9.35E-05	2.01E-04	3.85E-04	5.02E-04	4.90E-04	4.50E-04	4.38E-04	3.75E-04	3.57E-04	3.72E-04	3.90E-04	4.06E-04	4.35E-04	4.53E-04	4.39E-04	3.61E-04	3.02E-04	2.78E-04	2.41E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1166	0.0848	0.0866	0.0957	0.1025	0.2457	0.2653	0.1740	0.1283	0.1270	0.1313	0.1358	0.1068	0.1097	0.1104	0.1095	0.1081	0.1096	0.1061	0.1050	0.1067	0.1142	0.1132	0.1076
	NO2	g/vehicle/km	0.0177	0.0162	0.0166	0.0173	0.0176	0.0255	0.0264	0.0207	0.0183	0.0182	0.0189	0.0193	0.0183	0.0186	0.0189	0.0187	0.0183	0.0185	0.0181	0.0182	0.0182	0.0186	0.0183	0.0178
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0084***	***0.0050***	***0.0035***	***0.0029***	***0.0026***	***0.0079***	***0.0182***	***0.0285***	***0.0309***	***0.0297***	***0.0283***	***0.0280***	***0.0193***	***0.0186***	***0.0198***	***0.0206***	***0.0212***	***0.0231***	***0.0237***	***0.0225***	***0.0188***	***0.0165***	***0.0152***	***0.0128***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.63E-03	3.31E-03	2.33E-03	1.93E-03	1.73E-03	5.25E-03	1.21E-02	1.90E-02	2.06E-02	1.98E-02	1.89E-02	1.87E-02	1.29E-02	1.24E-02	1.32E-02	1.38E-02	1.41E-02	1.54E-02	1.58E-02	1.50E-02	1.25E-02	1.10E-02	1.02E-02	8.52E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.81E-03	1.65E-03	1.17E-03	9.65E-04	8.64E-04	2.62E-03	6.06E-03	9.49E-03	1.03E-02	9.90E-03	9.43E-03	9.35E-03	6.44E-03	6.19E-03	6.61E-03	6.88E-03	7.07E-03	7.72E-03	7.90E-03	7.51E-03	6.26E-03	5.49E-03	5.08E-03	4.26E-03
	Emission in each Box of 1st jet	g/s	1.88E-03	1.10E-03	7.78E-04	6.44E-04	5.76E-04	1.75E-03	4.04E-03	6.33E-03	6.88E-03	6.60E-03	6.29E-03	6.23E-03	4.29E-03	4.13E-03	4.41E-03	4.59E-03	4.71E-03	5.14E-03	5.27E-03	5.00E-03	4.17E-03	3.66E-03	3.39E-03	2.84E-03
	Emission in each Box of 2nd jet	g/s	9.38E-04	5.51E-04	3.89E-04	3.22E-04	2.88E-04	8.75E-04	2.02E-03	3.16E-03	3.44E-03	3.30E-03	3.14E-03	3.12E-03	2.15E-03	2.06E-03	2.20E-03	2.29E-03	2.36E-03	2.57E-03	2.63E-03	2.50E-03	2.09E-03	1.83E-03	1.69E-03	1.42E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0009***	***0.0007***	***0.0005***	***0.0004***	***0.0008***	***0.0018***	***0.0034***	***0.0044***	***0.0043***	***0.0041***	***0.0040***	***0.0033***	***0.0031***	***0.0034***	***0.0035***	***0.0036***	***0.0039***	***0.0040***	***0.0039***	***0.0032***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.53E-04	6.33E-04	4.46E-04	3.50E-04	2.96E-04	5.45E-04	1.21E-03	2.26E-03	2.93E-03	2.84E-03	2.72E-03	2.66E-03	2.21E-03	2.10E-03	2.26E-03	2.35E-03	2.39E-03	2.60E-03	2.69E-03	2.61E-03	2.13E-03	1.79E-03	1.65E-03	1.41E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.27E-04	3.16E-04	2.23E-04	1.75E-04	1.48E-04	2.72E-04	6.03E-04	1.13E-03	1.47E-03	1.42E-03	1.36E-03	1.33E-03	1.10E-03	1.05E-03	1.13E-03	1.18E-03	1.20E-03	1.30E-03	1.34E-03	1.30E-03	1.07E-03	8.94E-04	8.24E-04	7.07E-04
	Emission in each Box of 1st jet	g/s	2.84E-04	2.11E-04	1.49E-04	1.17E-04	9.87E-05	1.82E-04	4.02E-04	7.53E-04	9.78E-04	9.48E-04	9.07E-04	8.87E-04	7.35E-04	6.99E-04	7.55E-04	7.84E-04	7.98E-04	8.67E-04	8.96E-04	8.69E-04	7.11E-04	5.96E-04	5.49E-04	4.71E-04
	Emission in each Box of 2nd jet	g/s	1.42E-04	1.05E-04	7.44E-05	5.83E-05	4.94E-05	9.08E-05	2.01E-04	3.76E-04	4.89E-04	4.74E-04	4.53E-04	4.44E-04	3.68E-04	3.49E-04	3.77E-04	3.92E-04	3.99E-04	4.34E-04	4.48E-04	4.34E-04	3.55E-04	2.98E-04	2.75E-04	2.36E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1181	0.0866	0.0884	0.0977	0.1047	0.2509	0.2706	0.1786	0.1299	0.1274	0.1335	0.1360	0.1088	0.1115	0.1098	0.1090	0.1108	0.1092	0.1093	0.1050	0.1068	0.1142	0.1132	0.1091
	NO2	g/vehicle/km	0.0179	0.0165	0.0169	0.0177	0.0179	0.0260	0.0269	0.0212	0.0185	0.0183	0.0192	0.0194	0.0186	0.0190	0.0188	0.0186	0.0188	0.0184	0.0186	0.0182	0.0182	0.0186	0.0184	0.0181
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0085***	***0.0051***	***0.0036***	***0.0030***	***0.0026***	***0.0080***	***0.0186***	***0.0292***	***0.0313***	***0.0298***	***0.0288***	***0.0281***	***0.0197***	***0.0189***	***0.0197***	***0.0205***	***0.0217***	***0.0231***	***0.0244***	***0.0225***	***0.0188***	***0.0165***	***0.0153***	***0.0130***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.70E-03	3.38E-03	2.38E-03	1.97E-03	1.76E-03	5.36E-03	1.24E-02	1.95E-02	2.09E-02	1.99E-02	1.92E-02	1.87E-02	1.31E-02	1.26E-02	1.32E-02	1.37E-02	1.45E-02	1.54E-02	1.63E-02	1.50E-02	1.25E-02	1.10E-02	1.02E-02	8.65E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.85E-03	1.69E-03	1.19E-03	9.86E-04	8.82E-04	2.68E-03	6.19E-03	9.74E-03	1.04E-02	9.94E-03	9.59E-03	9.37E-03	6.56E-03	6.30E-03	6.58E-03	6.85E-03	7.24E-03	7.69E-03	8.13E-03	7.51E-03	6.26E-03	5.49E-03	5.08E-03	4.32E-03
	Emission in each Box of 1st jet	g/s	1.90E-03	1.13E-03	7.94E-04	6.57E-04	5.88E-04	1.79E-03	4.12E-03	6.49E-03	6.96E-03	6.62E-03	6.39E-03	6.25E-03	4.37E-03	4.20E-03	4.38E-03	4.57E-03	4.83E-03	5.13E-03	5.42E-03	5.00E-03	4.18E-03	3.66E-03	3.39E-03	2.88E-03
	Emission in each Box of 2nd jet	g/s	9.50E-04	5.63E-04	3.97E-04	3.29E-04	2.94E-04	8.93E-04	2.06E-03	3.25E-03	3.48E-03	3.31E-03	3.20E-03	3.12E-03	2.19E-03	2.10E-03	2.19E-03	2.28E-03	2.41E-03	2.56E-03	2.71E-03	2.50E-03	2.09E-03	1.83E-03	1.69E-03	1.44E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0018***	***0.0035***	***0.0045***	***0.0043***	***0.0041***	***0.0040***	***0.0034***	***0.0032***	***0.0034***	***0.0035***	***0.0037***	***0.0039***	***0.0041***	***0.0039***	***0.0032***	***0.0027***	***0.0025***	***0.0021***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.65E-04	6.45E-04	4.55E-04	3.57E-04	3.02E-04	5.55E-04	1.23E-03	2.31E-03	2.97E-03	2.86E-03	2.76E-03	2.67E-03	2.25E-03	2.14E-03	2.26E-03	2.34E-03	2.45E-03	2.60E-03	2.76E-03	2.61E-03	2.13E-03	1.79E-03	1.65E-03	1.43E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.32E-04	3.22E-04	2.27E-04	1.78E-04	1.51E-04	2.78E-04	6.14E-04	1.16E-03	1.48E-03	1.43E-03	1.38E-03	1.33E-03	1.12E-03	1.07E-03	1.13E-03	1.17E-03	1.23E-03	1.30E-03	1.38E-03	1.30E-03	1.07E-03	8.95E-04	8.24E-04	7.16E-04
	Emission in each Box of 1st jet	g/s	2.88E-04	2.15E-04	1.52E-04	1.19E-04	1.01E-04	1.85E-04	4.09E-04	7.71E-04	9.90E-04	9.53E-04	9.21E-04	8.89E-04	7.49E-04	7.14E-04	7.52E-04	7.79E-04	8.18E-04	8.65E-04	9.21E-04	8.69E-04	7.11E-04	5.97E-04	5.50E-04	4.77E-04
	Emission in each Box of 2nd jet	g/s	1.44E-04	1.07E-04	7.58E-05	5.94E-05	5.03E-05	9.25E-05	2.05E-04	3.85E-04	4.95E-04	4.76E-04	4.60E-04	4.45E-04	3.75E-04	3.57E-04	3.76E-04	3.90E-04	4.09E-04	4.33E-04	4.61E-04	4.34E-04	3.56E-04	2.98E-04	2.75E-04	2.39E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1173	0.0860	0.0877	0.0963	0.1066	0.2550	0.2736	0.1763	0.1309	0.1289	0.1352	0.1358	0.1102	0.1146	0.1120	0.1119	0.1096	0.1089	0.1087	0.1037	0.1100	0.1170	0.1160	0.1118
	NO2	g/vehicle/km	0.0178	0.0164	0.0167	0.0174	0.0182	0.0264	0.0272	0.0209	0.0187	0.0185	0.0194	0.0193	0.0189	0.0194	0.0191	0.0191	0.0186	0.0184	0.0185	0.0180	0.0187	0.0191	0.0188	0.0185
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0085***	***0.0050***	***0.0035***	***0.0029***	***0.0027***	***0.0082***	***0.0188***	***0.0289***	***0.0316***	***0.0301***	***0.0291***	***0.0281***	***0.0199***	***0.0194***	***0.0201***	***0.0211***	***0.0215***	***0.0230***	***0.0243***	***0.0222***	***0.0194***	***0.0169***	***0.0156***	***0.0133***
	2/3 of NO emission rate in 1st 50m Box	g/s	5.66E-03	3.35E-03	2.36E-03	1.94E-03	1.80E-03	5.45E-03	1.25E-02	1.92E-02	2.11E-02	2.01E-02	1.94E-02	1.87E-02	1.33E-02	1.29E-02	1.34E-02	1.41E-02	1.43E-02	1.53E-02	1.62E-02	1.48E-02	1.29E-02	1.12E-02	1.04E-02	8.86E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	2.83E-03	1.68E-03	1.18E-03	9.71E-04	8.98E-04	2.72E-03	6.25E-03	9.62E-03	1.05E-02	1.00E-02	9.71E-03	9.35E-03	6.64E-03	6.47E-03	6.71E-03	7.03E-03	7.17E-03	7.67E-03	8.09E-03	7.41E-03	6.45E-03	5.62E-03	5.21E-03	4.43E-03
	Emission in each Box of 1st jet	g/s	1.89E-03	1.12E-03	7.88E-04	6.48E-04	5.99E-04	1.82E-03	4.17E-03	6.41E-03	7.02E-03	6.70E-03	6.47E-03	6.23E-03	4.43E-03	4.31E-03	4.47E-03	4.69E-03	4.78E-03	5.11E-03	5.40E-03	4.94E-03	4.30E-03	3.75E-03	3.47E-03	2.95E-03
	Emission in each Box of 2nd jet	g/s	9.43E-04	5.58E-04	3.94E-04	3.24E-04	2.99E-04	9.08E-04	2.08E-03	3.21E-03	3.51E-03	3.35E-03	3.24E-03	3.12E-03	2.21E-03	2.16E-03	2.24E-03	2.34E-03	2.39E-03	2.56E-03	2.70E-03	2.47E-03	2.15E-03	1.87E-03	1.74E-03	1.48E-03
NO_2 Emission Rate		g/s	***0.0013***	***0.0010***	***0.0007***	***0.0005***	***0.0005***	***0.0008***	***0.0019***	***0.0034***	***0.0045***	***0.0043***	***0.0042***	***0.0040***	***0.0034***	***0.0033***	***0.0034***	***0.0036***	***0.0036***	***0.0039***	***0.0041***	***0.0039***	***0.0033***	***0.0028***	***0.0025***	***0.0022***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	8.59E-04	6.40E-04	4.51E-04	3.52E-04	3.06E-04	5.64E-04	1.24E-03	2.29E-03	3.00E-03	2.88E-03	2.79E-03	2.66E-03	2.28E-03	2.19E-03	2.29E-03	2.40E-03	2.43E-03	2.58E-03	2.75E-03	2.57E-03	2.20E-03	1.83E-03	1.68E-03	1.46E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.29E-04	3.20E-04	2.26E-04	1.76E-04	1.53E-04	2.82E-04	6.21E-04	1.14E-03	1.50E-03	1.44E-03	1.40E-03	1.33E-03	1.14E-03	1.10E-03	1.15E-03	1.20E-03	1.21E-03	1.29E-03	1.37E-03	1.28E-03	1.10E-03	9.17E-04	8.42E-04	7.32E-04
	Emission in each Box of 1st jet	g/s	2.86E-04	2.13E-04	1.50E-04	1.17E-04	1.02E-04	1.88E-04	4.14E-04	7.62E-04	1.00E-03	9.61E-04	9.30E-04	8.87E-04	7.59E-04	7.30E-04	7.64E-04	7.99E-04	8.09E-04	8.62E-04	9.16E-04	8.56E-04	7.33E-04	6.11E-04	5.62E-04	4.88E-04
	Emission in each Box of 2nd jet	g/s	1.43E-04	1.07E-04	7.52E-05	5.86E-05	5.11E-05	9.40E-05	2.07E-04	3.81E-04	5.00E-04	4.81E-04	4.65E-04	4.43E-04	3.79E-04	3.65E-04	3.82E-04	4.00E-04	4.04E-04	4.31E-04	4.58E-04	4.28E-04	3.66E-04	3.06E-04	2.81E-04	2.44E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1326	0.0982	0.0999	0.1106	0.1179	0.2820	0.3036	0.2025	0.1489	0.1465	0.1476	0.1519	0.1239	0.1262	0.1242	0.1234	0.1226	0.1214	0.1221	0.1182	0.1217	0.1302	0.1292	0.1239
	NO2	g/vehicle/km	0.0200	0.0185	0.0188	0.0197	0.0199	0.0290	0.0300	0.0239	0.0210	0.0208	0.0211	0.0214	0.0210	0.0212	0.0210	0.0209	0.0205	0.0203	0.0205	0.0203	0.0205	0.0210	0.0208	0.0204
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0096***	***0.0057***	***0.0040***	***0.0033***	***0.0030***	***0.0090***	***0.0208***	***0.0331***	***0.0359***	***0.0343***	***0.0318***	***0.0314***	***0.0224***	***0.0214***	***0.0223***	***0.0233***	***0.0240***	***0.0257***	***0.0273***	***0.0254***	***0.0214***	***0.0188***	***0.0174***	***0.0147***
	2/3 of NO emission rate in 1st 50m Box	g/s	6.40E-03	3.83E-03	2.69E-03	2.23E-03	1.99E-03	6.03E-03	1.39E-02	2.21E-02	2.39E-02	2.28E-02	2.12E-02	2.09E-02	1.49E-02	1.42E-02	1.49E-02	1.55E-02	1.60E-02	1.71E-02	1.82E-02	1.69E-02	1.43E-02	1.25E-02	1.16E-02	9.82E-03
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.20E-03	1.91E-03	1.35E-03	1.12E-03	9.94E-04	3.01E-03	6.94E-03	1.10E-02	1.20E-02	1.14E-02	1.06E-02	1.05E-02	7.47E-03	7.12E-03	7.44E-03	7.75E-03	8.01E-03	8.55E-03	9.09E-03	8.45E-03	7.14E-03	6.26E-03	5.80E-03	4.91E-03
	Emission in each Box of 1st jet	g/s	2.13E-03	1.28E-03	8.98E-04	7.44E-04	6.63E-04	2.01E-03	4.63E-03	7.36E-03	7.98E-03	7.61E-03	7.07E-03	6.97E-03	4.98E-03	4.75E-03	4.96E-03	5.17E-03	5.34E-03	5.70E-03	6.06E-03	5.63E-03	4.76E-03	4.17E-03	3.87E-03	3.27E-03
	Emission in each Box of 2nd jet	g/s	1.07E-03	6.38E-04	4.49E-04	3.72E-04	3.31E-04	1.00E-03	2.31E-03	3.68E-03	3.99E-03	3.81E-03	3.53E-03	3.49E-03	2.49E-03	2.37E-03	2.48E-03	2.58E-03	2.67E-03	2.85E-03	3.03E-03	2.82E-03	2.38E-03	2.09E-03	1.93E-03	1.64E-03
NO_2 Emission Rate		g/s	***0.0014***	***0.0011***	***0.0008***	***0.0006***	***0.0005***	***0.0009***	***0.0021***	***0.0039***	***0.0051***	***0.0049***	***0.0045***	***0.0044***	***0.0038***	***0.0036***	***0.0038***	***0.0039***	***0.0040***	***0.0043***	***0.0046***	***0.0044***	***0.0036***	***0.0030***	***0.0028***	***0.0024***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	9.64E-04	7.23E-04	5.08E-04	3.98E-04	3.36E-04	6.20E-04	1.37E-03	2.61E-03	3.38E-03	3.24E-03	3.03E-03	2.95E-03	2.54E-03	2.39E-03	2.52E-03	2.63E-03	2.69E-03	2.86E-03	3.06E-03	2.90E-03	2.41E-03	2.02E-03	1.87E-03	1.61E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	4.82E-04	3.61E-04	2.54E-04	1.99E-04	1.68E-04	3.10E-04	6.85E-04	1.30E-03	1.69E-03	1.62E-03	1.51E-03	1.48E-03	1.27E-03	1.20E-03	1.26E-03	1.31E-03	1.34E-03	1.43E-03	1.53E-03	1.45E-03	1.20E-03	1.01E-03	9.33E-04	8.06E-04
	Emission in each Box of 1st jet	g/s	3.21E-04	2.41E-04	1.69E-04	1.33E-04	1.12E-04	2.07E-04	4.57E-04	8.70E-04	1.13E-03	1.08E-03	1.01E-03	9.84E-04	8.45E-04	7.97E-04	8.40E-04	8.75E-04	8.95E-04	9.52E-04	1.02E-03	9.68E-04	8.03E-04	6.74E-04	6.22E-04	5.38E-04
	Emission in each Box of 2nd jet	g/s	1.61E-04	1.20E-04	8.46E-05	6.64E-05	5.59E-05	1.03E-04	2.28E-04	4.35E-04	5.63E-04	5.41E-04	5.04E-04	4.92E-04	4.23E-04	3.99E-04	4.20E-04	4.38E-04	4.48E-04	4.76E-04	5.10E-04	4.84E-04	4.01E-04	3.37E-04	3.11E-04	2.69E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involvec	109P1
Road Located	109
Vehicle EF Adopte	109

		Unit																									
Month		-	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1457	0.1096	0.1119	0.1252	0.1338	0.3182	0.3419	0.2276	0.1682	0.1660	0.1671	0.1708	0.1375	0.1401	0.1379	0.1371	0.1355	0.1367	0.1347	0.1325	0.1356	0.1449	0.1440	0.1387
	NO2	g/vehicle/km	0.0218	0.0204	0.0208	0.0220	0.0223	0.0325	0.0335	0.0267	0.0235	0.0234	0.0237	0.0240	0.0232	0.0234	0.0232	0.0231	0.0226	0.0226	0.0225	0.0226	0.0227	0.0232	0.0230	0.0226
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0105***	***0.0064***	***0.0045***	***0.0038***	***0.0034***	***0.0102***	***0.0234***	***0.0373***	***0.0406***	***0.0388***	***0.0360***	***0.0353***	***0.0249***	***0.0237***	***0.0248***	***0.0259***	***0.0266***	***0.0289***	***0.0301***	***0.0284***	***0.0239***	***0.0209***	***0.0194***	***0.0165***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.03E-03	4.27E-03	3.01E-03	2.53E-03	2.26E-03	6.80E-03	1.56E-02	2.48E-02	2.71E-02	2.59E-02	2.40E-02	2.35E-02	1.66E-02	1.58E-02	1.65E-02	1.72E-02	1.77E-02	1.93E-02	2.01E-02	1.89E-02	1.59E-02	1.39E-02	1.29E-02	1.10E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.51E-03	2.14E-03	1.51E-03	1.26E-03	1.13E-03	3.40E-03	7.81E-03	1.24E-02	1.35E-02	1.29E-02	1.20E-02	1.18E-02	8.29E-03	7.91E-03	8.26E-03	8.62E-03	8.86E-03	9.63E-03	1.00E-02	9.47E-03	7.95E-03	6.97E-03	6.47E-03	5.49E-03
	Emission in each Box of 1st jet	g/s	2.34E-03	1.42E-03	1.00E-03	8.42E-04	7.52E-04	2.27E-03	5.21E-03	8.28E-03	9.02E-03	8.62E-03	8.00E-03	7.84E-03	5.53E-03	5.27E-03	5.51E-03	5.75E-03	5.91E-03	6.42E-03	6.68E-03	6.32E-03	5.30E-03	4.65E-03	4.31E-03	3.66E-03
	Emission in each Box of 2nd jet	g/s	1.17E-03	7.12E-04	5.02E-04	4.21E-04	3.76E-04	1.13E-03	2.60E-03	4.14E-03	4.51E-03	4.31E-03	4.00E-03	3.92E-03	2.76E-03	2.64E-03	2.75E-03	2.87E-03	2.95E-03	3.21E-03	3.34E-03	3.16E-03	2.65E-03	2.32E-03	2.16E-03	1.83E-03
NO_2 Emission Rate		g/s	***0.0016***	***0.0012***	***0.0008***	***0.0007***	***0.0006***	***0.0010***	***0.0023***	***0.0044***	***0.0057***	***0.0055***	***0.0051***	***0.0049***	***0.0042***	***0.0040***	***0.0042***	***0.0043***	***0.0044***	***0.0048***	***0.0050***	***0.0048***	***0.0040***	***0.0033***	***0.0031***	***0.0027***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.05E-03	7.96E-04	5.60E-04	4.44E-04	3.75E-04	6.95E-04	1.53E-03	2.91E-03	3.78E-03	3.65E-03	3.40E-03	3.30E-03	2.80E-03	2.64E-03	2.78E-03	2.90E-03	2.95E-03	3.19E-03	3.35E-03	3.22E-03	2.66E-03	2.23E-03	2.06E-03	1.79E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.26E-04	3.98E-04	2.80E-04	2.22E-04	1.88E-04	3.47E-04	7.66E-04	1.46E-03	1.89E-03	1.82E-03	1.70E-03	1.65E-03	1.40E-03	1.32E-03	1.39E-03	1.45E-03	1.48E-03	1.59E-03	1.67E-03	1.61E-03	1.33E-03	1.12E-03	1.03E-03	8.96E-04
	Emission in each Box of 1st jet	g/s	3.50E-04	2.65E-04	1.87E-04	1.48E-04	1.25E-04	2.32E-04	5.11E-04	9.71E-04	1.26E-03	1.22E-03	1.13E-03	1.10E-03	9.32E-04	8.80E-04	9.27E-04	9.67E-04	9.84E-04	1.06E-03	1.12E-03	1.07E-03	8.87E-04	7.44E-04	6.88E-04	5.97E-04
	Emission in each Box of 2nd jet	g/s	1.75E-04	1.33E-04	9.33E-05	7.39E-05	6.26E-05	1.16E-04	2.55E-04	4.85E-04	6.30E-04	6.08E-04	5.67E-04	5.50E-04	4.66E-04	4.40E-04	4.64E-04	4.83E-04	4.92E-04	5.31E-04	5.58E-04	5.37E-04	4.43E-04	3.72E-04	3.44E-04	2.99E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.

Appendix 3.5 - Emission Inventory for Portal Emissions

(Without Project Operation)

Calculations of Portal Emissions (Long-term assessment)

Section	109A01-109A05
Enclosure Involved	109P1
Road Located	109
Vehicle EF Adopted	109

		Unit																									
Month		-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Hour		time	0000-0100	0100-0200	0200-0300	0300-0400	0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100	2100-2200	2200-2300	2300-2400
Traffic Flow		veh/hr	1425	1151	796	596	498	631	1350	3223	4749	4605	4243	4068	3562	3335	3539	3713	3863	4160	4398	4223	3465	2840	2653	2341
Total Composite Vehicluar Emission Factor	NO	g/vehicle/km	0.1539	0.1152	0.1176	0.1308	0.1415	0.3334	0.3570	0.2376	0.1757	0.1731	0.1738	0.1780	0.1430	0.1456	0.1437	0.1427	0.1410	0.1419	0.1413	0.1372	0.1409	0.1502	0.1512	0.1456
	NO2	g/vehicle/km	0.0228	0.0212	0.0216	0.0227	0.0233	0.0339	0.0348	0.0277	0.0245	0.0242	0.0245	0.0248	0.0240	0.0242	0.0241	0.0239	0.0234	0.0234	0.0234	0.0232	0.0234	0.0239	0.0239	0.0235
	RSP	g/vehicle/km	0.0109	0.0080	0.0081	0.0090	0.0096	0.0232	0.0249	0.0166	0.0122	0.0120	0.0124	0.0126	0.0103	0.0105	0.0103	0.0103	0.0101	0.0101	0.0100	0.0097	0.0101	0.0107	0.0107	0.0103
	FSP	g/vehicle/km	0.0100	0.0074	0.0075	0.0083	0.0089	0.0214	0.0229	0.0153	0.0112	0.0111	0.0114	0.0116	0.0095	0.0097	0.0095	0.0095	0.0093	0.0093	0.0092	0.0090	0.0093	0.0099	0.0099	0.0095
Parameters of the Enclosure	Width of Enclosure	m	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Height of Enclosure	m	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Length of Tunnel	m	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83	182.83
	Number of 1st 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Number of 2nd 50m Box	#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NO Emission Rate		g/s	***0.0111***	***0.0067***	***0.0048***	***0.0040***	***0.0036***	***0.0107***	***0.0245***	***0.0389***	***0.0424***	***0.0405***	***0.0374***	***0.0368***	***0.0259***	***0.0247***	***0.0258***	***0.0269***	***0.0277***	***0.0300***	***0.0316***	***0.0294***	***0.0248***	***0.0217***	***0.0204***	***0.0173***
	2/3 of NO emission rate in 1st 50m Box	g/s	7.43E-03	4.49E-03	3.17E-03	2.64E-03	2.39E-03	7.12E-03	1.63E-02	2.59E-02	2.83E-02	2.70E-02	2.50E-02	2.45E-02	1.72E-02	1.64E-02	1.72E-02	1.79E-02	1.84E-02	2.00E-02	2.10E-02	1.96E-02	1.65E-02	1.44E-02	1.36E-02	1.15E-02
	1/3 of NO emission rate in 2nd 50m Box	g/s	3.71E-03	2.25E-03	1.59E-03	1.32E-03	1.19E-03	3.56E-03	8.16E-03	1.30E-02	1.41E-02	1.35E-02	1.25E-02	1.23E-02	8.62E-03	8.22E-03	8.61E-03	8.97E-03	9.22E-03	9.99E-03	1.05E-02	9.81E-03	8.26E-03	7.22E-03	6.79E-03	5.77E-03
	Emission in each Box of 1st jet	g/s	2.48E-03	1.50E-03	1.06E-03	8.80E-04	7.95E-04	2.37E-03	5.44E-03	8.64E-03	9.42E-03	9.00E-03	8.32E-03	8.17E-03	5.75E-03	5.48E-03	5.74E-03	5.98E-03	6.15E-03	6.66E-03	7.01E-03	6.54E-03	5.51E-03	4.81E-03	4.53E-03	3.85E-03
	Emission in each Box of 2nd jet	g/s	1.24E-03	7.48E-04	5.28E-04	4.40E-04	3.98E-04	1.19E-03	2.72E-03	4.32E-03	4.71E-03	4.50E-03	4.16E-03	4.09E-03	2.87E-03	2.74E-03	2.87E-03	2.99E-03	3.07E-03	3.33E-03	3.51E-03	3.27E-03	2.75E-03	2.41E-03	2.26E-03	1.92E-03
NO_2 Emission Rate		g/s	***0.0017***	***0.0012***	***0.0009***	***0.0007***	***0.0006***	***0.0011***	***0.0024***	***0.0045***	***0.0059***	***0.0057***	***0.0053***	***0.0051***	***0.0043***	***0.0041***	***0.0043***	***0.0045***	***0.0046***	***0.0049***	***0.0052***	***0.0050***	***0.0041***	***0.0034***	***0.0032***	***0.0028***
	2/3 of NO2 emission rate in 1st 50m Box	g/s	1.10E-03	8.28E-04	5.83E-04	4.59E-04	3.92E-04	7.23E-04	1.59E-03	3.02E-03	3.93E-03	3.78E-03	3.52E-03	3.42E-03	2.90E-03	2.73E-03	2.89E-03	3.00E-03	3.06E-03	3.29E-03	3.49E-03	3.32E-03	2.75E-03	2.30E-03	2.15E-03	1.87E-03
	1/3 of NO2 emission rate in 2nd 50m Box	g/s	5.51E-04	4.14E-04	2.91E-04	2.29E-04	1.96E-04	3.62E-04	7.96E-04	1.51E-03	1.97E-03	1.89E-03	1.76E-03	1.71E-03	1.45E-03	1.37E-03	1.44E-03	1.50E-03	1.53E-03	1.65E-03	1.74E-03	1.66E-03	1.37E-03	1.15E-03	1.07E-03	9.33E-04
	Emission in each Box of 1st jet	g/s	3.67E-04	2.76E-04	1.94E-04	1.53E-04	1.31E-04	2.41E-04	5.31E-04	1.01E-03	1.31E-03	1.26E-03	1.17E-03	1.14E-03	9.65E-04	9.11E-04	9.63E-04	1.00E-03	1.02E-03	1.10E-03	1.16E-03	1.11E-03	9.16E-04	7.66E-04	7.16E-04	6.22E-04
	Emission in each Box of 2nd jet	g/s	1.84E-04	1.38E-04	9.71E-05	7.64E-05	6.53E-05	1.21E-04	2.65E-04	5.04E-04	6.56E-04	6.30E-04	5.87E-04	5.70E-04	4.83E-04	4.55E-04	4.81E-04	5.01E-04	5.09E-04	5.49E-04	5.81E-04	5.53E-04	4.58E-04	3.83E-04	3.58E-04	3.11E-04
RSP Emission Rate		g/s	***7.87E-04***	***4.69E-04***	***3.29E-04***	***2.73E-04***	***2.44E-04***	***7.44E-04***	***1.71E-03***	***2.72E-03***	***2.93E-03***	***2.81E-03***	***2.66E-03***	***2.61E-03***	***1.87E-03***	***1.78E-03***	***1.86E-03***	***1.95E-03***	***1.98E-03***	***2.14E-03***	***2.23E-03***	***2.09E-03***	***1.77E-03***	***1.55E-03***	***1.44E-03***	***1.23E-03***
	2/3 of RSP emission rate in 1st 50m Box	g/s	5.25E-04	3.13E-04	2.19E-04	1.82E-04	1.63E-04	4.96E-04	1.14E-03	1.81E-03	1.96E-03	1.87E-03	1.78E-03	1.74E-03	1.24E-03	1.19E-03	1.24E-03	1.30E-03	1.32E-03	1.43E-03	1.48E-03	1.39E-03	1.18E-03	1.03E-03	9.62E-04	8.20E-04
	1/3 of RSP emission rate in 2nd 50m Box	g/s	2.62E-04	1.56E-04	1.10E-04	9.10E-05	8.13E-05	2.48E-04	5.70E-04	9.05E-04	9.78E-04	9.36E-04	8.88E-04	8.69E-04	6.22E-04	5.93E-04	6.20E-04	6.49E-04	6.61E-04	7.13E-04	7.42E-04	6.96E-04	5.90E-04	5.16E-04	4.81E-04	4.10E-04
	Emission in each Box of 1st jet	g/s	1.75E-04	1.04E-04	7.32E-05	6.07E-05	5.42E-05	1.65E-04	3.80E-04	6.03E-04	6.52E-04	6.24E-04	5.92E-04	5.79E-04	4.15E-04	3.96E-04	4.13E-04	4.33E-04	4.41E-04	4.75E-04	4.95E-04	4.64E-04	3.93E-04	3.44E-04	3.21E-04	2.73E-04
	Emission in each Box of 2nd jet	g/s	8.74E-05	5.21E-05	3.66E-05	3.03E-05	2.71E-05	8.26E-05	1.90E-04	3.02E-04	3.26E-04	3.12E-04	2.96E-04	2.90E-04	2.07E-04	1.98E-04	2.07E-04	2.16E-04	2.20E-04	2.38E-04	2.47E-04	2.32E-04	1.97E-04	1.72E-04	1.60E-04	1.37E-04
FSP Emission Rate		g/s	***7.25E-04***	***4.32E-04***	***3.03E-04***	***2.51E-04***	***2.25E-04***	***6.84E-04***	***1.57E-03***	***2.50E-03***	***2.70E-03***	***2.59E-03***	***2.45E-03***	***2.40E-03***	***1.72E-03***	***1.64E-03***	***1.71E-03***	***1.79E-03***	***1.83E-03***	***1.97E-03***	***2.05E-03***	***1.92E-03***	***1.63E-03***	***1.43E-03***	***1.33E-03***	***1.13E-03***
	2/3 of FSP emission rate in 1st 50m Box	g/s	4.83E-04	2.88E-04	2.02E-04	1.68E-04	1.50E-04	4.56E-04	1.05E-03	1.67E-03	1.80E-03	1.72E-03	1.63E-03	1.60E-03	1.15E-03	1.09E-03	1.14E-03	1.20E-03	1.22E-03	1.31E-03	1.37E-03	1.28E-03	1.09E-03	9.51E-04	8.87E-04	7.55E-04
	1/3 of FSP emission rate in 2nd 50m Box	g/s	2.42E-04	1.44E-04	1.01E-04	8.38E-05	7.49E-05	2.28E-04	5.24E-04	8.33E-04	9.01E-04	8.62E-04	8.17E-04	8.00E-04	5.73E-04	5.47E-04	5.71E-04	5.98E-04	6.09E-04	6.56E-04	6.83E-04	6.40E-04	5.43E-04	4.75E-04	4.43E-04	3.78E-04
	Emission in each Box of 1st jet	g/s	1.61E-04	9.60E-05	6.74E-05	5.59E-05	4.99E-05	1.52E-04	3.50E-04	5.55E-04	6.01E-04	5.75E-04	5.45E-04	5.33E-04	3.82E-04	3.64E-04	3.81E-04	3.99E-04	4.06E-04	4.37E-04	4.55E-04	4.27E-04	3.62E-04	3.17E-04	2.96E-04	2.52E-04
	Emission in each Box of 2nd jet	g/s	8.05E-05	4.80E-05	3.37E-05	2.79E-05	2.50E-05	7.60E-05	1.75E-04	2.78E-04	3.00E-04	2.87E-04	2.72E-04	2.67E-04	1.91E-04	1.82E-04	1.90E-04	1.99E-04	2.03E-04	2.19E-04	2.28E-04	2.13E-04	1.81E-04	1.58E-04	1.48E-04	1.26E-04
Initial Lateral Dimension		σy	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372	8.372
Initial Vertical Dimension		σz	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721	3.721

Notes:

(a) Traffic Flow and Composite Emission Factors are adopted from Appendix 3.2 and 3.3 respectively.

(b) It was assumed that 2/3 of the total emission from the portal is dispersed in the first 50m and 1/3 of the total emission is dispersed in the second 50m.