Appendix 3.02b Construction of CSTW - Calculation of Dust Emission Source (Short-term Prediction (Tier 2))

Construction of CSTW

Emission rates for Short-term Average Prediction (Tier 2)

Location	Source	Emission Rates	(Unmitigated)	(Mitigated)	Parameters		*Remarks*
Portal Exhaust	Exhaust Outlets during Construction of Cavern	Overall Emission Rate (during construciton hours)	**3.180553E-02**	**3.073899E-03**	TSP Emission Rate		*Overall Emission Rate for Heavy Construction, Loading, Screen and Crushing (With Enclosure and Dust Collector for dust suppression on Rock Crusher)*
		Volume Source ($g/s-m^2$)	**1.534185E-02**	**1.456933E-03**	RSP Emission Rate		*Emission Rate = (Construction Activities + Rock Loading + Rock Crushing + Screening) / Area of Exhaust*
	Source ID: 1		**5.732342E-03**	**2.557442E-04**	FSP Emission Rate		
					Area of Exhaust (m^2) (16m x 16m)	256	
	Construction Activities inside Cavern	Heavy Construction (g/s)	6.134748E+00	7.668435E-01	Emission Rate = (Emission Factor*10^6/10000)/(30*No. of Operation hour*60*60)*(Percentage Active/100)*Construction Area*(1-Dust Suppression%)		
					TSP emission factor (Mg/hectare/month of activity)	2.69	*from AP-42, S13.2.3, 1/95 ed.*
					Percentage area actively operating (%)	20	*Worst case assumption, refer to Justification of Percentage Active Works Area for Caverns for Relocation of STSTW*
					% of dust suppression	87.5	*Assuming watering eight times a day, reference to Kai Tak Development EIA Report*
					no. of operation hour (hr)	12	*Assumed typical working hours of work site referenced in AP-42*
					Emission height (m)	0.5	
					Total Construction Area in Cavern (m^2)	147781	*from enginneer*
			2.90174E+00	3.62717E-01	RSP emission factor (Mg/hectare/month of activity)	1.27237	
					RSP-to-TSP Ratio	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
			4.41702E-01	5.52127E-02	FSP emission factor (Mg/hectare/month of activity)	0.19368	
					FSP-to-TSP Ratio	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
	Rock Crusher inside Cavern	Truck Unloading - Fragmented Stone (g/s)	7.46667E-03	7.46667E-05	Emission Rate = Emission Factor*1000*Loading Rate/3600*Size Mulitplier*(1-Dust Suppression%)		
					RSP emission factor (kg/Mg)	0.000008	*from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1*
					TSP-to-RSP factor	2.1	*from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1*
					Loading rate (ton/hr)	1600	*from engineer*
					no. of operation hour (hr)	12	*from engineer (from 0700 to 1900)*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
			3.55556E-03	3.55556E-05	RSP emission factor (kg/Mg)	0.000008	*from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
			3.55556E-03	3.55556E-05	FSP emisison factor (kg/Mg)	0.000008	*adopt RSP emission factor as upper limit*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
		Tertiary Crushing (g/s)	1.20000E+00	1.20000E-02	Emission Rate = Emission Factor*Processing Rate*1000/3600*(1-Dust Suppression%)		
					TSP emission factor (kg/Mg)	0.0027	*from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1*
					Crushing rate (ton/hr)	1600	*from engineer*
					no. of operation hour (hr)	12	*from engineer (from 0700 to 1900)*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
			5.33333E-01	5.33333E-03	RSP emission factor (kg/Mg)	0.0012	*from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
			5.33333E-01	5.33333E-03	FSP emisison factor (kg/Mg)	0.0012	*adopt RSP emission factor as upper limit*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*

Appendix 3.02b Construction of CSTW - Calculation of Dust Emission Source (Short-term Prediction (Tier 2))

Construction of CSTW

Emission rates for Short-term Average Prediction (Tier 2)

Location	Source	Emission Rates	(Unmitigated)	(Mitigated)	Parameters		Remarks
		Fines Screening (controlled (with wet suppression) (g/s)	8.00000E-01	8.00000E-03	Emission Rate = Emission Factor*Processing Rate*1000/3600*(1-Dust Suppression%)		
					TSP emission factor (kg/Mg)	0.0018	*from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1*
					Crushing rate (ton/hr)	1600	*from engineer*
					no. of operation hour (hr)	12	*from engineer (from 0700 to 1900)*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
			4.88889E-01	4.88889E-03	RSP emission factor (kg/Mg)	0.0011	*from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
			4.88889E-01	4.88889E-03	FSP emisison factor (kg/Mg)	0.0011	*adopt RSP emission factor as upper limit*
					% of dust suppression	99%	*for typical removal efficiency for Dust Collector inside Enclosure Control Techniques for Particulate Emission from Stationary Sources Vol.2, Section 9.7.1.2.2*
Construction Sites at Main Portal	**Construction Activities** **Source ID: 2 - 28**	Heavy Construction Area Source ($g/m^2/s$)	**2.075617E-04**	**2.594522E-05**	Emission Rate = (Emission Factor*10^6/10000)/(30*No. of Operation hour*60*60)*(Percentage Active/100)*(1-Dust Suppression%)		
					TSP emission factor (Mg/hectare/month of activity)	2.69	*from AP-42, S13.2.3, 1/95 ed.*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					% of dust suppression	87.5	*Assuming watering eight times a day, reference to Kai Tak Development EIA Report*
					no. of operation hour (hr)	12	*Assumed typical working hours of work site referenced in AP-42*
					Emission height (m)	0.5	
			9.81767E-05	**1.22721E-05**	RSP emission factor (Mg/hectare/month of activity)	1.27237	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
			1.49444E-05	**1.86806E-06**	FSP emission factor (Mg/hectare/month of activity)	0.19368	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
		Wind Erosion Area Source ($g/m^2/s$)		**2.695332E-06**	Emission Rate = Emission Factor*10^6/(10000*365*24*60*60)*(Percentage Active/100)		
					TSP emission factor (Mg/hectare/yr)	0.85	*AP-42, 5th ed., Table 11.9.4*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					Emission height (m)	0.5	
				1.27489E-06	RSP emission factor (Mg/hectare/month of activity)	0.40205	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
				1.94064E-07	FSP emission factor (Mg/hectare/month of activity)	0.0612	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
Construction Sites at Secondary Portal	**Construction Activities** **Source ID: 30 - 39**	Heavy Construction Area Source ($g/m^2/s$)	**2.075617E-04**	**2.594522E-05**	Emission Rate = (Emission Factor*10^6/10000)/(30*No. of Operation hour*60*60)*(Percentage Active/100)*(1-Dust Suppression%)		
					TSP emission factor (Mg/hectare/month of activity)	2.69	*from AP-42, S13.2.3, 1/95 ed.*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					% of dust suppression	87.5	*Assuming watering eight times a day, reference to Kai Tak Development EIA Report*
					no. of operation hour (hr)	12	*Assumed typical working hours of work site referenced in AP-42*
					Emission height (m)	0.5	
			9.81767E-05	**1.22721E-05**	RSP emission factor (Mg/hectare/month of activity)	1.27237	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
			1.49444E-05	**1.86806E-06**	FSP emission factor (Mg/hectare/month of activity)	0.19368	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
		Wind Erosion Area Source ($g/m^2/s$)		**2.695332E-06**	Emission Rate = Emission Factor*10^6/(10000*365*24*60*60)*(Percentage Active/100)		
					TSP emission factor (Mg/hectare/yr)	0.85	*AP-42, 5th ed., Table 11.9.4*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					Emission height (m)	0.5	
				1.27489E-06	RSP emission factor (Mg/hectare/month of activity)	0.40205	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
				1.94064E-07	FSP emission factor (Mg/hectare/month of activity)	0.0612	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*

Appendix 3.02b Construction of CSTW - Calculation of Dust Emission Source (Short-term Prediction (Tier 2))

Construction of CSTW

Emission rates for Short-term Average Prediction (Tier 2)

Location	Source	Emission Rates	(Unmitigated)	(Mitigated)	Parameters		Remarks
Construction Sites at Ah Kung Kok Shan Road Surface Magazine Site	**Construction Activities**	Heavy Construction Area Source ($g/m^2/s$)	**2.075617E-04**	**2.594522E-05**	Emission Rate = (Emission Factor*10^6/10000)/(30*No. of Operation hour*60*60)*(Percentage Active/100)*(1-Dust Suppression%)		
	Source ID: 40 - 69				TSP emission factor (Mg/hectare/month of activity)	2.69	*from AP-42, S13.2.3, 1/95 ed.*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					% of dust suppression	87.5	*Assuming watering eight times a day, reference to Kai Tak Development EIA Report*
					no. of operation hour (hr)	12	*Assumed typical working hours of work site referenced in AP-42*
					Emission height (m)	0.5	
			9.81767E-05	**1.22721E-05**	RSP emission factor (Mg/hectare/month of activity)	1.27237	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
			1.49444E-05	**1.86806E-06**	FSP emission factor (Mg/hectare/month of activity)	0.19368	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
		Wind Erosion Area Source ($g/m^2/s$)		**2.695332E-06**	Emission Rate = Emission Factor*10^6/(10000*365*24*60*60)*(Percentage Active/100)		
					TSP emission factor (Mg/hectare/yr)	0.85	*AP-42, 5th ed., Table 11.9.4*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					Emission height (m)	0.5	
				1.27489E-06	RSP emission factor (Mg/hectare/month of activity)	0.40205	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
				1.94064E-07	FSP emission factor (Mg/hectare/month of activity)	0.0612	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
Haul Road Conneting Main Portal to Area 73	**Unpaved Haul Road** (assumed as Heavy Construction as worst case)	Heavy Construction Area Source ($g/m^2/s$)	**2.075617E-04**	**2.594522E-05**	Emission Rate = (Emission Factor*10^6/10000)/(30*No. of Operation hour*60*60)*(Percentage Active/100)*(1-Dust Suppression%)		
					TSP emission factor (Mg/hectare/month of activity)	2.69	*from AP-42, S13.2.3, 1/95 ed.*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					% of dust suppression	87.5	*Assuming watering eight times a day, reference to Kai Tak Development EIA Report*
	Source ID: 70 - 82				no. of operation hour (hr)	12	*Assumed typical working hours of work site referenced in AP-42*
					Emission height (m)	0.5	
			9.81767E-05	**1.22721E-05**	RSP emission factor (Mg/hectare/month of activity)	1.27237	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
			1.49444E-05	**1.86806E-06**	FSP emission factor (Mg/hectare/month of activity)	0.19368	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
		Wind Erosion Area Source ($g/m^2/s$)		**2.695332E-06**	Emission Rate = Emission Factor*10^6/(10000*365*24*60*60)*(Percentage Active/100)		
					TSP emission factor (Mg/hectare/yr)	0.85	*AP-42, 5th ed., Table 11.9.4*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					Emission height (m)	0.5	
				1.27489E-06	RSP emission factor (Mg/hectare/month of activity)	0.40205	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
				1.94064E-07	FSP emission factor (Mg/hectare/month of activity)	0.0612	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*

Appendix 3.02b Construction of CSTW - Calculation of Dust Emission Source (Short-term Prediction (Tier 2))

Construction of CSTW

Emission rates for Short-term Average Prediction (Tier 2)

Location	Source	Emission Rates	(Unmitigated)	(Mitigated)	Parameters		Remarks
Area 73	**Stockpile of Spoils from Cavern** (assumed as Heavy Construction as worst case) **Source ID: 83 - 113**	Heavy Construction Area Source ($g/m^2/s$)	**2.075617E-04**	**2.594522E-05**	Emission Rate = (Emission Factor*10^6/10000)/(30*No. of Operation hour*60*60)*(Percentage Active/100)*(1-Dust Suppression%)		
					TSP emission factor (Mg/hectare/month of activity)	2.69	*from AP-42, S13.2.3, 1/95 ed.*
					Percentage area actively operating (%)	100	*Full strength (Tier 2Test)*
					% of dust suppression	87.5	*Assuming watering eight times a day, reference to Kai Tak Development EIA Report*
					no. of operation hour (hr)	12	*Assumed typical working hours of work site referenced in AP-42*
					Emission height (m)	0.5	
			9.81767E-05	**1.22721E-05**	RSP emission factor (Mg/hectare/month of activity)	1.27237	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
			1.49444E-05	**1.86806E-06**	FSP emission factor (Mg/hectare/month of activity)	0.19368	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
		Wind Erosion Area Source ($g/m^2/s$)		**2.695332E-06**	Emission Rate = Emission Factor*10^6/(10000*365*24*60*60)*(Percentage Active/100)		
					TSP emission factor (Mg/hectare/yr)	0.85	*AP-42, 5th ed., Table 11.9.4*
					Percentage area actively operating (%)	100	*Full strength (Tier 2 Test)*
					Emission height (m)	0.5	
				1.27489E-06	RSP emission factor (Mg/hectare/month of activity)	0.40205	
					% fraction of TSP	0.473	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*
				1.94064E-07	FSP emission factor (Mg/hectare/month of activity)	0.0612	
					% fraction of TSP	0.072	*from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4*

Appendix 3.02b Construction of CSTW - Calculations of Construction Dust Emission Rates (Short-term Prediction (Tier 2))

Justification of Percentage Active Works Area for Caverns for Relocation of STSTW

Construction Peak Year = 2022

Total Area of for Works Area for Caverns = 122503.075 m^2

A1860 -Cavern Excavation (Drill & Blast) - Excavation of Caverns W4

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	4	120	120
Lorry	100%	2.4	10	4	96	96
Dump Truck	100%	2.4	10	4	96	96
Excavator	100%	3.2	8	4	102.4	102.4
Air compressor	100%	-	-	4	-	-
Water Pump	100%	-	-	4	-	-
Generator	100%	-	-	4	-	-
Cherry Picker	100%	3.2	8	4	102.4	102.4
Ventilation Fan	100%	-	-	4	-	-
					Total:	**516.8**
A1860				***Percentage of Usage Area to Works Area:***		***0.4%***

A1861 -Cavern Excavation (Drill & Blast) - Excavation of Caverns W3

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	4	120	120
Lorry	100%	2.4	10	4	96	96
Dump Truck	100%	2.4	10	4	96	96
Excavator	100%	3.2	8	4	102.4	102.4
Air compressor	100%	-	-	4	-	-
Water Pump	100%	-	-	4	-	-
Generator	100%	-	-	4	-	-
Cherry Picker	100%	3.2	8	4	102.4	102.4
Ventilation Fan	100%	-	-	4	-	-
					Total:	**516.8**
A1861				***Percentage of Usage Area to Works Area:***		***0.4%***

A1870 - Excavation of Driveway 4 (incl. A1, A2 & W1)

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	1	30	30
Lorry	100%	2.4	10	1	24	24
Dump Truck	100%	2.4	10	1	24	24
Excavator	100%	3.2	8	1	25.6	25.6
Air compressor	100%	-	-	1	-	-
Water Pump	100%	-	-	1	-	-
Generator	100%	-	-	1	-	-
Cherry Picker	100%	3.2	8	1	25.6	25.6
Ventilation Fan	100%	-	-	2	-	-
					Total:	**129.2**
A1870				***Percentage of Usage Area to Works Area:***		***0.5%***

A1871 - Excavation of Driveway a (incl. A1, A3, A4, W1, S1, S2 & W5)

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	1	30	30
Lorry	100%	2.4	10	1	24	24
Dump Truck	100%	2.4	10	1	24	24
Excavator	100%	3.2	8	1	25.6	25.6
Air compressor	100%	-	-	1	-	-
Water Pump	100%	-	-	1	-	-
Generator	100%	-	-	1	-	-
Cherry Picker	100%	3.2	8	1	25.6	25.6
Ventilation Fan	100%	-	-	2	-	-
					Total:	**129.2**
A1871				***Percentage of Usage Area to Works Area:***		***0.1%***

Appendix 3.02b Construction of CSTW - Calculations of Construction Dust Emission Rates (Short-term Prediction (Tier 2))

Justification of Percentage Active Works Area for Caverns for Relocation of STSTW

A1880 - Excavation of W2 (2 nos.)

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	2	60	60
Lorry	100%	2.4	10	2	48	48
Dump Truck	100%	2.4	10	2	48	48
Excavator	100%	3.2	8	2	51.2	51.2
Air compressor	100%	-	-	2	-	-
Water Pump	100%	-	-	2	-	-
Generator	100%	-	-	2	-	-
Cherry Picker	100%	3.2	8	2	51.2	51.2
Ventilation Fan	100%	-	-	2	-	-
					Total:	**258.4**
A1880				***Percentage of Usage Area to Works Area:***		***0.2%***

A1890 - Excavation of Cavern W2 (2nos.) &A3A4A5

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	2	60	60
Lorry	100%	2.4	10	2	48	48
Dump Truck	100%	2.4	10	2	48	48
Excavator	100%	3.2	8	2	51.2	51.2
Air compressor	100%	-	-	2	-	-
Water Pump	100%	-	-	2	-	-
Generator	100%	-	-	2	-	-
Cherry Picker	100%	3.2	8	2	51.2	51.2
Ventilation Fan	100%	-	-	2	-	-
					Total:	**258.4**
A1890				***Percentage of Usage Area to Works Area:***		***0.2%***

A1900 Excavation of Secondary Access Tunnel inside Caverns

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	1	30	30
Lorry	100%	2.4	10	1	24	24
Dump Truck	100%	2.4	10	1	24	24
Excavator	100%	3.2	8	1	25.6	25.6
Air compressor	100%	-	-	1	-	-
Water Pump	100%	-	-	1	-	-
Generator	100%	-	-	1	-	-
Cherry Picker	100%	3.2	8	1	25.6	25.6
Ventilation Fan	100%	-	-	2	-	-
					Total:	**103.6**
A1900				***Percentage of Usage Area to Works Area:***		***0.1%***

A1910 Excavation of Secondary Access Tunnel Outside Cavens (200m hard ground)

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	1	30	30
Lorry	100%	2.4	10	1	24	24
Dump Truck	100%	2.4	10	1	24	24
Excavator	100%	3.2	8	1	25.6	25.6
Air compressor	100%	-	-	1	-	-
Water Pump	100%	-	-	1	-	-
Generator	100%	-	-	1	-	-
Cherry Picker	100%	3.2	8	1	25.6	25.6
Ventilation Fan	100%	-	-	2	-	-
					Total:	**78**
A1910				***Percentage of Usage Area to Works Area:***		***0.1%***

Appendix 3.02b Construction of CSTW - Calculations of Construction Dust Emission Rates (Short-term Prediction (Tier 2))

Justification of Percentage Active Works Area for Caverns for Relocation of STSTW

A1920 - Excavation of Secondary Access Tunnel Outside Caverns (40m soft ground)

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	2	60	60
Lorry	100%	2.4	10	2	48	48
Dump Truck	100%	2.4	10	2	48	48
Excavator	100%	3.2	8	4	102.4	102.4
Cherry Picker	100%	3.2	8	2	51.2	51.2
					Total:	**309.6**
A1920				***Percentage of Usage Area to Works Area:***		***0.3%***

A1930 - Remaining Excavation in Side Caverns

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Drilling Jumbo	100%	3	10	10	300	300
Lorry	100%	2.4	10	10	240	240
Dump Truck	100%	2.4	10	10	240	240
Excavator	100%	3.2	8	20	512	512
Cherry Picker	100%	3.2	8	5	128	128
					Total:	**540**
A1930				***Percentage of Usage Area to Works Area:***		***0.4%***

Manuvour and Handling of C&D material in Area 73

Plant	Percentage of Usage (%)	Plan Size				Area in term of Time of Usage (m^2)
		B (m)	L (m)	No. of Item	Area(m^2)	
Excavator	100%	3.2	8	25	640	640
Lorry	100%	2.4	10	25	600	600
Dump Truck	100%	2.4	10	50	1200	1200
					Total:	**2440**
Activity 14				***Percentage of Usage Area to Works Area:***		***2.0%***

As a worst case assumption, all construction activities are assumed to be carried out at the same time	
Total Percentage of Usage Area to Works Area for CSTS	**4.7%**
Percentage adopted in Dust model for Short-term Assessment	**20%**
Percentage adopted in Dust model for Annual Assessment	**10%**