
Appendix 6.1
Detailed Chimney Emission Inventory

Appendix 6.1 Calculations of Chimney Emissions

Max. sulphur content of EPD = 0.5 %
Density = 845 kg/m³
Emission Factor of SO₂ of AP-42 (Table 1.3-1) = 71 lb/10³ gal
Emission Factor of NO_x of AP-42 (Table 1.3-1) = 20 lb/10³ gal
Emission Factor of PM of AP-42 (Table 1.3-1) = 2 lb/10³ gal
conversion factor to kg/10³ L = 0.12

ID	X	Y	HEIGHTAG	TOPDIA	GTEMP_EXIT	BO_MRATE	GO_MRATE	Velocity	SO ₂ Emission Rate	NO _x Emission Rate	RSP Emission Rate
2000	839220	820530	25.1	559	331	0	62	6	0.1467	0.0083	0.0041
2001	840650	819500	47.4	560	331	0	420	6	0.9940	0.0560	0.0280
2002	840740	819480	47.4	520	450	0	347	6	0.8212	0.0463	0.0231
2003	840810	819450	30.4	433	373	0	26	6	0.0615	0.0035	0.0017
2004	840580	819360	59.3	387	322	215	0	6	0.5088	0.0287	0.0143
2005	840570	819320	47.5	783	473	0	315	6	0.7455	0.0420	0.0210
2006	840600	819343	47.7	584	364	0	420	6	0.9940	0.0560	0.0280
2007	840620	819310	47.2	740	332	0	315	6	0.7455	0.0420	0.0210
2008	840570	819260	47.6	652	310	215	0	6	0.5088	0.0287	0.0143
2009	840620	819180	47.7	680	330	0	110	6	0.2603	0.0147	0.0073
2010	840620	819180	47.7	680	330	0	100	6	0.2367	0.0133	0.0067
2011	840650	819140	47.2	714	324	0	315	6	0.7455	0.0420	0.0210
2012	840650	819160	47.2	515	319	0	147	6	0.3479	0.0196	0.0098
2013	840650	819190	47.2	741	323	0	315	6	0.7455	0.0420	0.0210
2014	840700	819150	53.6	400	407	215	0	6	0.5088	0.0287	0.0143
2015	840780	819130	58.4	496	373	315	0	6	0.7455	0.0420	0.0210
2016	840790	819130	47.9	967	320	0	461	6	1.0910	0.0615	0.0307
2017	840790	819130	47.9	948	314	0	347	6	0.8212	0.0463	0.0231
2018	840790	819130	47.9	992	324	0	508	6	1.2023	0.0677	0.0339
2019	840790	819130	65.0	300	373	0	134	6	0.3171	0.0179	0.0089
2020	840810	819100	47.9	895	327	0	381	6	0.9017	0.0508	0.0254
2021	840810	819110	47.9	880	326	0	461	6	1.0910	0.0615	0.0307
2022	840710	819260	47.3	691	322	215	0	6	0.5088	0.0287	0.0143
2023	840960	818970	47.5	508	368	0	347	6	0.8212	0.0463	0.0231
2024	841270	818960	55.7	280	398	0	122	6	0.2887	0.0163	0.0081
2025	840440	819530	46.6	864	319	0	215	6	0.5088	0.0287	0.0143
2026	840740	819020	47.5	830	329	0	508	6	1.2023	0.0677	0.0339
2027	840920	819070	30.9	300	373	0	91	6	0.2154	0.0121	0.0061
2028	841040	819320	47.0	254	341	0	69	6	0.1633	0.0092	0.0046
2029	839970	820120	47.2	280	342	0	57	6	0.1349	0.0076	0.0038
2030	838490	822200	61.7	300	422	0	134	6	0.3171	0.0179	0.0089
2031	838440	822050	53.7	457	440	0	215	6	0.5088	0.0287	0.0143
2032	838410	821900	42.1	406	479	178	0	6	0.4213	0.0237	0.0119
2033	838420	821920	45.7	500	479	260	0	6	0.6153	0.0347	0.0173
2034	839300	821800	21.3	356	373	0	26	6	0.0615	0.0035	0.0017
2035	837100	820690	28.7	460	339	0	162	6	0.3834	0.0216	0.0108
2036	837100	820690	28.7	460	339	0	162	6	0.3834	0.0216	0.0108
2037	837110	820810	40.6	440	475	0	162	6	0.3834	0.0216	0.0108
2038	837110	820820	40.6	440	475	0	162	6	0.3834	0.0216	0.0108
2039	837120	820820	40.6	440	475	0	162	6	0.3834	0.0216	0.0108
2040	837120	820820	40.6	440	475	0	162	6	0.3834	0.0216	0.0108
2041	837300	820690	32.0	381	330	0	47	6	0.1112	0.0063	0.0031
2042	837300	820690	32.0	381	330	0	69	6	0.1633	0.0092	0.0046
2043	837390	820690	18.0	203	373	0	32	6	0.0757	0.0043	0.0021
2049	837837	820081	44.5	500	450	0	0	20.4	0.0000	0.0333	0.0000
2054	837904	820141	34.0	1000	473	0	0	5.5	0.0000	0.0694	0.0000
2055	837913	820136	34.0	1000	473	0	0	5.5	0.0000	0.0694	0.0000
2056	837921	820133	34.0	1000	473	0	0	5.5	0.0000	0.0694	0.0000
2057	837928	820130	34.0	1000	473	0	0	5.5	0.0000	0.0694	0.0000
2058	837910	819980	41.1	490	331	0	134	6	0.3171	0.0179	0.0089
2059	837910	819990	39.4	402	325	0	75	6	0.1775	0.0100	0.0050
2060	837720	819600	41.2	876	397	0	508	6	1.2023	0.0677	0.0339
2061	841200	818740	27.0	200	473	0	211	6	0.4994	0.0281	0.0141
2062	845946	817672	6.0	1000	1173	0	0	6.759	0.0053	0.4247	0.2654
2063	840207	819670	33.0	300	373	0	220	6	0.5210	0.0294	0.0147
2064	840650	819500	47.4	560	373	0	220	6	0.5210	0.0294	0.0147
2065	840466	819377	30.0	400	373	0	220	6	0.5210	0.0294	0.0147
2066	840700	819150	53.6	400	373	0	220	6	0.5210	0.0294	0.0147
2067	840757	819026	33.0	300	373	0	220	6	0.5210	0.0294	0.0147
2068	841066	818871	30.0	400	373	0	220	6	0.5210	0.0294	0.0147
2069	840942	819093	48.0	450	373	0	220	6	0.5210	0.0294	0.0147
2070	841153	818898	39.0	650	373	0	220	6	0.5210	0.0294	0.0147
2071	841153	818898	39.0	650	373	0	220	6	0.5210	0.0294	0.0147
2072	841467	819046	42.0	500	373	0	220	6	0.5210	0.0294	0.0147
2073	841477	819034	42.0	500	373	0	220	6	0.5210	0.0294	0.0147
2074	838440	822050	53.7	457	373	0	220	6	0.5210	0.0294	0.0147
2075	838342	821900	30.0	450	373	0	220	6	0.5210	0.0294	0.0147
2076	838342	821900	30.0	450	373	0	220	6	0.5210	0.0294	0.0147
2077	838342	821900	30.0	450	373	0	220	6	0.5210	0.0294	0.0147
2078	838342	821900	30.0	450	373	0	220	6	0.5210	0.0294	0.0147
2079	837743	819631	39.0	350	373	0	220	6	0.5210	0.0294	0.0147
215	839486	819737	60.0	500	298	0	600	6	1.4200	0.0800	0.0400

Notes: (1) Chimney ID 2000 - 2062 are extracted from the approved SEKDCFS EIA report.
(2) Fuel consumption rates of chimney ID 2063-2079 are the average consumption rates of chimney ID 2000-2062, except 2054-2057.
(3) Chimney ID 2062 are extracted from the approved TKO EIA report
(4) From SP License (No. L-8-004(1)), SO₂ and Fugitive Emission from chimney ID 2054-2057 is found to be 0
(5) From SP License (No. L-8-004(1)), Maximum NO_x Emission from chimney ID 2054-2057 is 1.25kg/h, and from chimney ID 2049 is 0.6 kg/h
(6) The velocity of chimney ID 2049,2054-2057 equals Exhaust Flowrate/3600/3.14/radius². From SP License (No. L-8-004(1)), the flowrate of ID 2049 is 14444 m³/hr, while for ID 2054-2057 is 15451 m³/hr.

Calculations of Sai Tso Wan Landfill Gas Flaring Plant

Parameters

Emission Limit of Nox (mg/m ³)	400
Emission Limit of RSP (mg/m ³)	50
Emission Limit of SO ₂ (mg/m ³)	1
Exhaust Volume Flow Rate (m ³ /hr)	19110

SO₂ Emission Rate

$$\begin{aligned}\text{SO}_2 \text{ Emission Rate (g/s)} &= \frac{\text{Flow Rate (m}^3\text{/hr)} * \text{Emission Limit of SO}_2 \text{ (mg/m}^3\text{)}}{1000 \text{ (mg/g)} * 3600 \text{ (s/hr)}} \\ &= \frac{19110 \text{ (m}^3\text{/hr)} * 1 \text{ (mg/m}^3\text{)}}{1000 \text{ (mg/g)} * 3600 \text{ (s/hr)}} \\ &= 0.0053 \text{ (g/s)}\end{aligned}$$

NO₂ Emission Rate

$$\begin{aligned}\text{NO}_2 \text{ Emission Rate (g/s)} &= \frac{\text{Flow Rate (m}^3\text{/hr)} * \text{Emission Limit of NO}_x \text{ (mg/m}^3\text{)} * 0.2}{1000 \text{ (mg/g)} * 3600 \text{ (s/hr)}} \\ &= \frac{19110 \text{ (m}^3\text{/hr)} * 400 \text{ (mg/m}^3\text{)} * 0.2}{1000 \text{ (mg/g)} * 3600 \text{ (s/hr)}} \\ &= 0.4247 \text{ (g/s)}\end{aligned}$$

RSP Emission Rate

$$\begin{aligned}\text{RSP Emission Rate (g/s)} &= \frac{\text{Flow Rate (m}^3\text{/hr)} * \text{Emission Limit of RSP (mg/m}^3\text{)}}{1000 \text{ (mg/g)} * 3600 \text{ (s/hr)}} \\ &= \frac{19110 \text{ (m}^3\text{/hr)} * 50 \text{ (mg/m}^3\text{)}}{1000 \text{ (mg/g)} * 3600 \text{ (s/hr)}} \\ &= 0.2654 \text{ (g/s)}\end{aligned}$$

Emission Parameter and calculation method are made reference from *Approved Further Development of Tseung Kwan O Feasibility Study EIA Report*.