

Appendix 3.8 Detailed Calculations of Industrial Emissions

Fuel Emission Factor for industrial boilers

Pollutant		Emission Factor	Remarks
NOx	=	20 lb/10 ³ gal	USEPA AP-42 5th Ed Vol. I Section 1.3 - "Fuel Oil Combustion", Table 1.3-1 and 1.3-6: Emission Factors for uncontrolled industrial boilers firing distillate oil
	=	2.396 g/L	
RSP	=	1 lb/10 ³ gal	
	=	0.1198 g/L	
FSP	=	0.25 lb/10 ³ gal	
	=	0.02995 g/L	

The chimney owner of Kwai Tak Industrial Building (TW_23) responded that there was only 1 operative chimney and the fuel consumption rate was 20L per hour.

Therefore, the hourly NOx, RSP, and FSP emission factors were as follows:

Hourly Emission Factor of TW_23

Reported Fuel consumption rate	=	20	L/hr
NOx	=	1.33E-02	g/s
RSP	=	6.66E-04	g/s
FSP	=	1.66E-04	g/s

Appendix 3.8 Detailed Calculations of Industrial Emissions

Emission Inventory for Industrial Emission Sources

Source	Type	X	Y	Exhaust Gas Flow	Stack Height	Exit Temperature	Exit Velocity	Stack Diameter	x	y	Angle	Operation Hours	RSP		FSP		NO _x		Remarks
													Emission Limit	Emission Rate	Emission Limit	Emission Rate	Emission Limit	Emission Rate	
ID		(m)	(m)	(m ³ /h)	(m)	(K)	(m/s)	(m)	(m)	(m)	(degree)	(hr)	mg/m ³	(g/s) / (g/m ² /s)	mg/m ³	(g/s) / (g/m ² /s)	mg/m ³	(g/s) / (g/m ² /s)	
TW5_3	POINT	828770.0	825980.0	-	108.1	395	20.05	0.55	-	-	-	24	-	1.000E-02	-	1.000E-02	-	1.005E-01	Data extracted from to the approved EIA report of the Tsuen Wan Bypass, widening of Tsuen Wan Road between Tsuen Tsang Interchange and Kwai Tsang Interchange, and associated junction improvement works (AEIAR-124/2008). Daytime emission rate is adopted as conservative approach. The emission rates and emission limits of Kwai Chung Crematorium (TW7_145a, TW7_145b, TW7_146a and TW7_146b) are calculated based on Guidance Note on the Best Practicable Means for Incinerators (Crematoria) and information presented in the SP License. As a conservative approach, TSP is assumed to be 100% RSP. Stack parameters are based on SP License. Exit velocity for Kwai Chung Crematorium = Exhaust Gas Flow ÷ Stack Exit Surface Area ÷ 3600 where Exhaust Gas Flow and Stack Exit Surface Area are based on SP License. If FSP emission data is not available, all RSP emission would be assumed as FSP (i.e. 100%) as conservative assumptions.
TW5_5	POINT	828780.0	825980.0	-	114	450	16.30	0.61	-	-	-	24	-	1.000E-02	-	1.000E-02	-	1.005E-01	
TW5_83	POINT	830170.0	825160.0	-	58.7	450	11.51	0.36	-	-	-	24	-	2.400E-03	-	2.400E-03	-	2.400E-02	
TW5_84	POINT	830180.0	825170.0	-	53.9	450	7.47	0.56	-	-	-	24	-	3.900E-03	-	3.900E-03	-	3.880E-02	
TW7_145a	POINT	830188.0	824181.0	3700	30	438	12.02	0.33	-	-	-	7:00 - 22:00	20	2.056E-02	20	2.056E-02	200	2.056E-01	
TW7_145b	POINT	830189.0	824181.0	3700	30	438	12.02	0.33	-	-	-	7:00 - 22:00	20	2.056E-02	20	2.056E-02	200	2.056E-01	
TW7_146a	POINT	830190.0	824181.0	3700	30	438	12.02	0.33	-	-	-	7:00 - 22:00	20	2.056E-02	20	2.056E-02	200	2.056E-01	
TW7_146b	POINT	830191.0	824181.0	5600	30	438	14.47	0.37	-	-	-	7:00 - 22:00	20	3.111E-02	20	3.111E-02	200	3.111E-01	
TW7_168	POINT	830250.0	824250.0	-	98	428	9.72	0.54	-	-	-	24	-	4.700E-03	-	4.700E-03	-	4.690E-02	
TW7_180	POINT	830260.0	824260.0	-	98.8	443	9.31	0.64	-	-	-	24	-	6.200E-03	-	6.200E-03	-	6.240E-02	
TW7_181	POINT	830260.0	824260.0	-	95.6	450	17.03	0.41	-	-	-	24	-	4.700E-03	-	4.700E-03	-	4.690E-02	
TW7_207	POINT	830390.0	824370.0	-	96.3	444	13.18	0.51	-	-	-	24	-	5.700E-03	-	5.700E-03	-	5.680E-02	
TW7_210	POINT	830410.0	824370.0	-	97.7	505	9.52	0.60	-	-	-	24	-	5.700E-03	-	5.700E-03	-	5.680E-02	
TW7_211	POINT	830410.0	824380.0	-	101.1	450	9.52	0.60	-	-	-	24	-	5.700E-03	-	5.700E-03	-	5.680E-02	
TW_4	POINT	830542.0	825379.0	-	43.1	322	0.88	0.50	-	-	-	24	-	1.210E-02	-	1.210E-02	-	1.213E-01	
TW_18	POINT	829908.0	825212.0	-	57	322	0.88	0.20	-	-	-	24	-	1.210E-02	-	1.210E-02	-	1.213E-01	
TW_19	POINT	829892.0	825207.0	-	57	322	0.88	0.20	-	-	-	24	-	1.210E-02	-	1.210E-02	-	1.213E-01	
TW_20	POINT	830653.0	824316.0	-	117.7	322	0.88	0.30	-	-	-	24	-	1.210E-02	-	1.210E-02	-	1.213E-01	
TW_21	POINT	830645.0	824300.0	-	117.7	322	0.88	0.30	-	-	-	24	-	1.210E-02	-	1.210E-02	-	1.213E-01	
TW_23	POINT	830726.0	823815.0	-	61	322	0.88	0.50	-	-	-	24	-	6.656E-04	-	1.664E-04	-	1.331E-02	
CWTC_1	POINT	829044.0	821240.0	73000	76.2	433	31.2	0.91	-	-	-	24	30	6.083E-01	30	6.083E-01	400	8.111E+00	
CWTC_2	POINT	829052.0	821244.0	20900	40	433	7.19	1.014	-	-	-	24	16	9.289E-02	16	9.289E-02	192	1.115E+00	
CWTC_4a	POINT	829069.0	821222.0	12360	6.6	677	109.3	0.2	-	-	-	24	-	-	-	-	1665	5.717E+00	
CWTC_4b	POINT	829069.0	821222.0	12360	6.6	677	109.3	0.2	-	-	-	24	-	-	-	-	1665	5.717E+00	
EP1	POINT	826447.0	823640.0	93000	16	383	21.1	1.25	-	-	-	24	50	1.292E+00	50	1.292E+00	-	3.000E+00	
EP2	AREA	826504.0	823612.0	34	15	0	-	-	5	3	0	24	50	3.148E-05	50	3.148E-05	-	-	
EP3	POINT	826519.0	823619.0	1215	5	493	6.9	0.25	-	-	-	24	-	2.733E-03	-	2.733E-03	-	2.733E-02	
EP4	AREA	826542.0	823690.0	-	0	0	-	-	5	180	0	24	-	6.490E-05	-	6.490E-05	-	-	
EP5	AREA	826517.0	823630.0	-	4.3	0	-	-	3.5	3.5	0	24	-	1.814E-06	-	1.814E-06	-	-	
EP6	AREA	826518.0	823586.0	-	3	0	-	-	10	8	0	24	-	1.786E-04	-	1.786E-04	-	-	
EP7	AREA	826520.0	823635.0	-	3	0	-	-	5	3	0	24	-	5.370E-06	-	5.370E-06	-	-	
EP8	AREA	826518.0	823586.0	-	3	0	-	-	10	8	0	24	-	2.778E-07	-	2.778E-07	-	-	
EP9	AREA	826456.0	823684.0	-	1	0	-	-	5	3	0	24	-	2.380E-06	-	2.380E-06	-	-	
EP10	AREA	826533.0	823621.0	-	1	0	-	-	15.8	36.5	0	24	-	2.647E-05	-	2.647E-05	-	-	
EP11	POINT	826483.0	823639.0	1215	3	493	10.7	0.2	-	-	-	24	50	1.688E-02	50	1.688E-02	-	2.000E-02	
EP12	AREA	826476.5	823647.3	-	2.5	0	-	-	0.8	0.6	0	24	-	1.215E-04	-	1.215E-04	-	-	
EP13	AREA	826476.5	823647.3	-	0	0	-	-	0.5	0.4	0	24	-	4.583E-05	-	4.583E-05	-	-	