

Appendix 3.4 Calculation of Emission Rate of the Industrial Chimneys within the Assessment Area

Particle Size Distribution for CH1_1A of Hong Kong Petrochemical Co. Ltd., CH4_EP2 & CH4_EP3 of Yau Sang Galvanizing (Hot-Dip) Co. Ltd., non SP plants

Reference: Table 1.3-6, USEPA AP-42

Particle Diameter (μm)	Average Particle Diameter (μm)	Cumulative Mass % of Stated Size
0.625	0.3125	2%
1	0.8125	8%
1.25	1.125	9%
2.5	1.875	12%
6	4.25	30%
10	8	50%
15	12.5	68%

Particle Size Distribution for CH4_EP1 of Yau Sang Galvanizing (Hot-Dip) Co. Ltd.

Reference: Category 8, Process: Melting, Smelting, Refining, Appendix B2, USEPA AP-42

Particle Diameter (μm)	Average Particle Diameter (μm)	Cumulative Mass % of Stated Size
1	0.5	72%
2	1.5	80%
2.5	2.25	82%
3	2.75	84%
4	3.5	86%
5	4.5	88%
6	5.5	89%
10	8	92%

Remarks:

Particle size distribution of various processes are extracted and presented as above, thus Method 1 of particle dry deposition is applied in AERMOD for the above sources.

Particle Size Distribution for Hong Kong Petrochemical Co. Ltd. (except CH1_1A)

RSP emission is adopted TSP emission as a conservation approach. FSP fraction is 0.1, thus Method 2 of particle dry deposition is applied in AERMOD.

Appendix 3.4 Calculation of Emission Rate of the Industrial Chimneys within the Assessment Area

Particle Size Distribution for CH3_EP2 of EMIX Industrial (HK) Ltd.

Reference: Table 11.5-3 (Rotary Dryers), USEPA AP-42

According to the SP Licence, CH3_EP2 is served for sand dryer. The uncontrolled particle size distribution with reference to Table 11.5-3 (Rotary Dryers) in USEPA AP-42 is adopted at this emission point.

Particle Diameter (µm)	Average Particle Diameter (µm)	Cumulative Mass % of Stated Size
2.5	1.25	2.5%
6	4.25	10%
10	8	24%
15	12.5	37%
20	17.5	51%

Uncontrolled RSP/TSP Ratio = 0.24
 Uncontrolled FSP/TSP Ratio = 0.025

According to the SP Licence of the plant, bag filters have been installed at each emission point. The removal efficiency of the bag filter for different particle sizes are shown below.

Particle Diameter (µm)	Dust Removal Efficiency	References
10 - 30 ^[1]	99.9	SP Licence
6 - 10	99.5	USEPA AP-42 Appendix B2
2.5 - 6	99.5	USEPA AP-42 Appendix B2
0 - 2.5	99	USEPA AP-42 Appendix B2

Therefore, the particle size distribution at the emission points of EMIX Industrial (HK) Ltd. would be as follows.

Particle Diameter (µm)	Uncontrolled Distribution	Controlled Distribution	Normalized Controlled Distribution
10 - 30	0.76	0.00076	0.3645
2.5 - 10	0.215	0.001075	0.5156
0 - 2.5	0.025	0.00025	0.1199

From the table above, the controlled particle ratio at CH3_EP2 of EMIX Industrial (HK) Ltd. is shown below.

Controlled RSP/TSP Ratio = 0.6355
 Controlled FSP/TSP Ratio = 0.1199

Remarks:

Particle size distribution of various processes are extracted and presented as above, thus Method 1 of particle dry deposition is applied in AERMOD for the above source.

[1] The removal efficiency of the filter for the particle size range for 10-30 µm is not suggested in USEPA AP-42. Hence, the filter bag dust removal efficiency of 99.9% stated in the SP Licence is adopted for the particle size range of 10-30 µm.

Appendix 3.4 Calculation of Emission Rate of the Industrial Chimneys within the Assessment Area

Particle Size Distribution for EMIX Industrial (HK) Ltd. (except CH3_EP2)

Reference: Category 3, Process: Mechanically Generated, Appendix B2, USEPA AP-42

According to Appendix B2 of USEPA AP-42, the uncontrolled particle size distribution of mechanically generated process presented below.

Particle Diameter (µm)	Average Particle Diameter (µm)	Cumulative Mass % of Stated Size
1	0.5	4.0%
2	1.5	11%
2.5	2.25	15%
3	2.75	18%
4	3.5	25%
5	4.5	30%
6	5.5	34%
10	8	51%

Uncontrolled RSP/TSP Ratio = 0.51

Uncontrolled FSP/TSP Ratio = 0.15

According to the SP Licence of the plant, bag filters have been installed at each emission point. The removal efficiency of the bag filter for different particle sizes are shown below.

Particle Diameter (µm)	Dust Removal Efficiency	References
10 - 30 ^[1]	99.9	SP Licence
6 - 10	99.5	USEPA AP-42 Appendix B2
2.5 - 6	99.5	USEPA AP-42 Appendix B2
0 - 2.5	99	USEPA AP-42 Appendix B2

Therefore, the particle size distribution at the emission points (except CH3_EP2) of EMIX Industrial (HK) Ltd. would be as follows.

Particle Diameter (µm)	Uncontrolled Distribution	Controlled Distribution	Normalized Controlled Distribution
10 - 30	0.49	0.00049	0.1293
2.5 - 10	0.36	0.0018	0.4749
0 - 2.5	0.15	0.0015	0.3958

From the table above, the controlled particle ratio at the emission points of EMIX Industrial (HK) Ltd. is shown below.

Controlled RSP/TSP Ratio = 0.8707

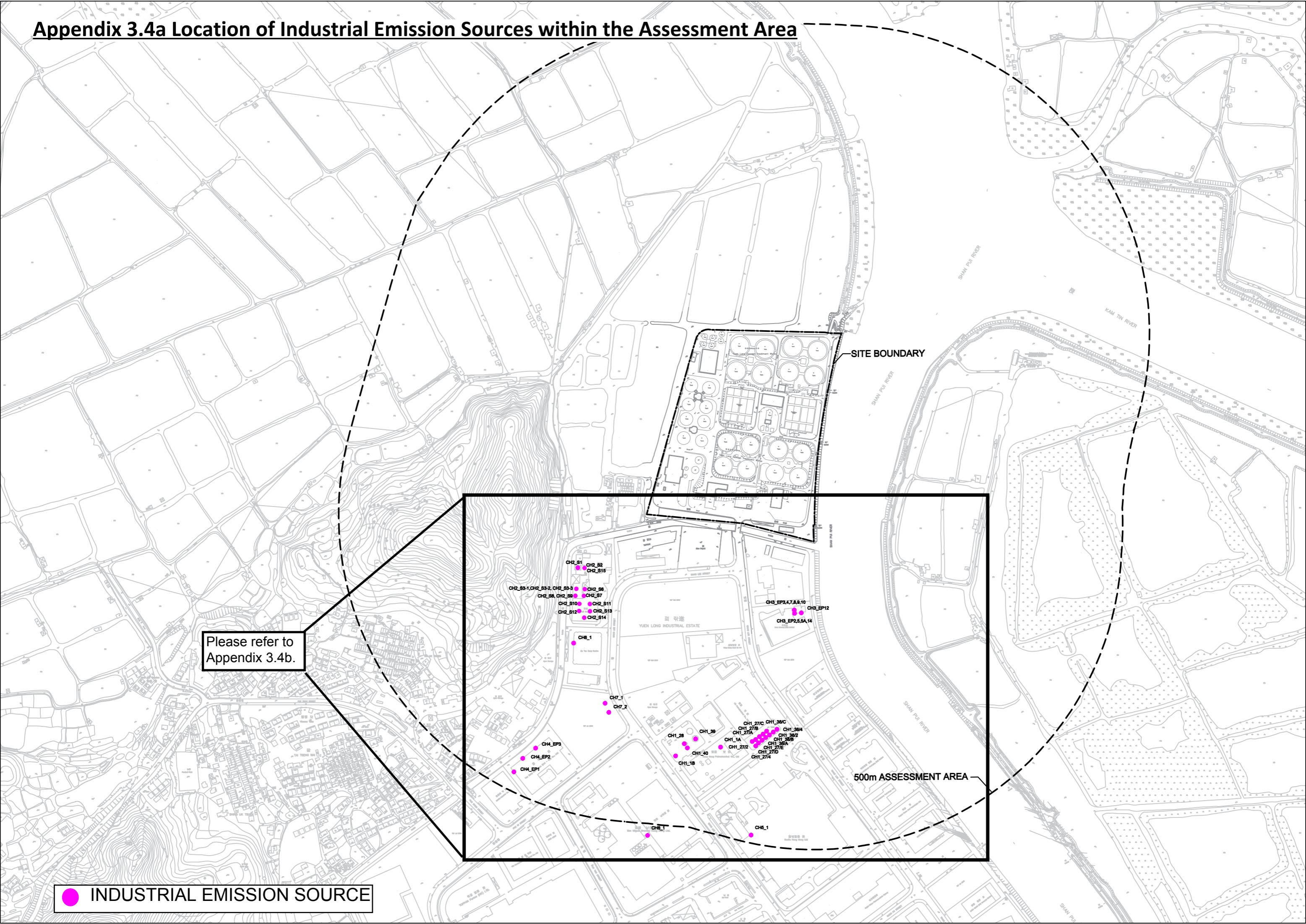
Controlled FSP/TSP Ratio = 0.3958

Remarks:

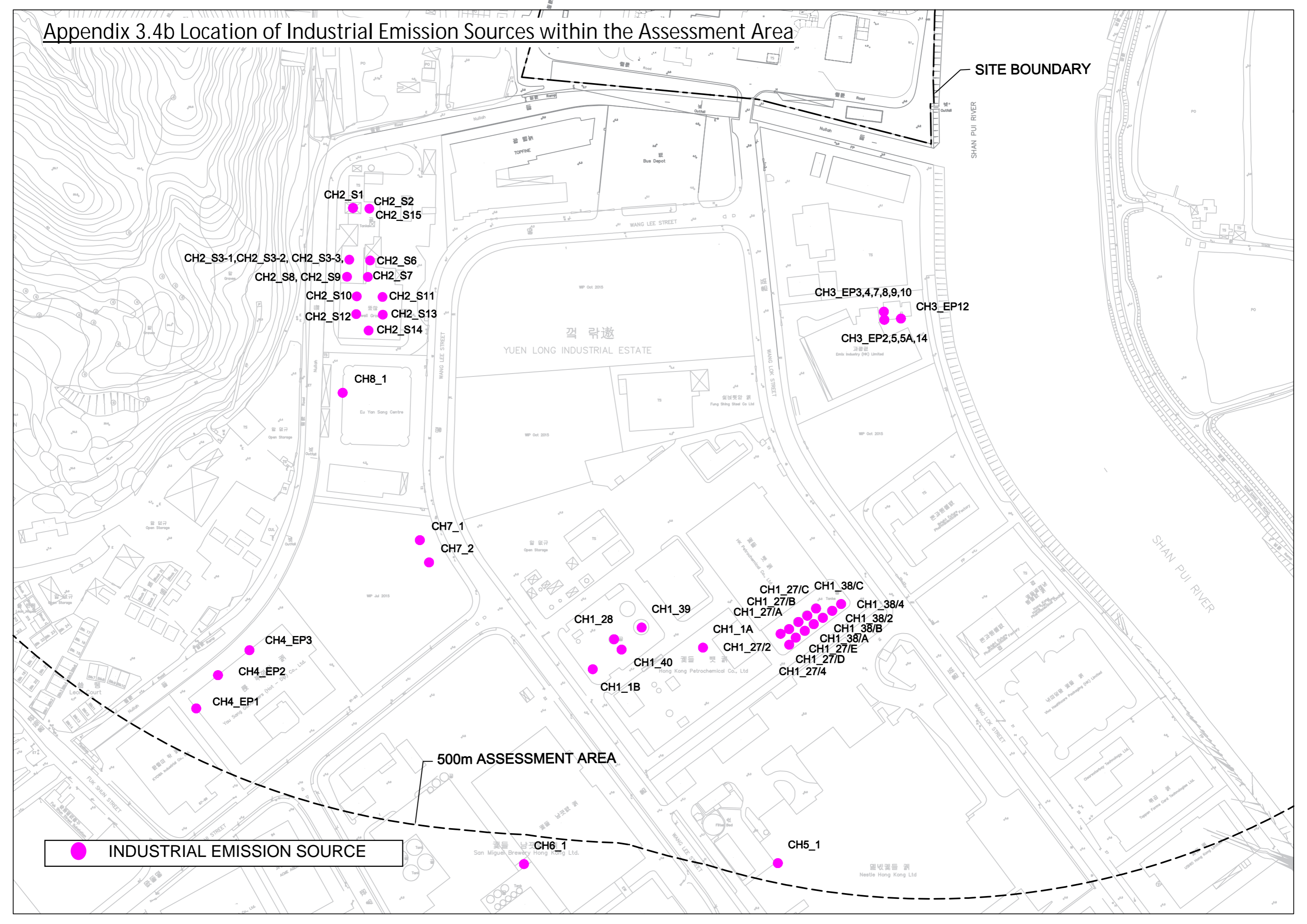
Particle size distribution of various processes are extracted and presented as above, thus Method 1 of particle dry deposition is applied in AERMOD for the above source.

[1] The removal efficiency of the filter for the particle size range for 10-30 µm is not suggested in USEPA AP-42. Hence, the filter bag dust removal efficiency of 99.9% stated in the SP Licence is adopted for the particle size range of 10-30 µm.

Appendix 3.4a Location of Industrial Emission Sources within the Assessment Area



Appendix 3.4b Location of Industrial Emission Sources within the Assessment Area



SITE BOUNDARY

SHAN PUI RIVER


YUEN LONG INDUSTRIAL ESTATE

SHAN PUI RIVER

500m ASSESSMENT AREA

INDUSTRIAL EMISSION SOURCE

Appendix 3.4c Building Layout of Industrial Buildings within the Assessment Area

 BUILDING BLOCK
 CONSIDERED IN THE
 ASSESSMENT

Building ID	Building Height (mAG)
BLD_1	3 & 6
BLD_2	6
BLD_3	21
BLD_4	15
BLD_5	6
BLD_6	12
BLD_7	18
BLD_8	24
BLD_9	6 & 12
BLD_10	6
BLD_11	15
BLD_12	9
BLD_13	9
BLD_14	12
BLD_15	15
BLD_16	9
BLD_17	20

