Details of Dust Emission Sources for 1-hour TSP (Tier 1)

Work Area	Sources Heavy construction		Parameter	Remarks	
Kong Nga Po		Percentage active area, p	100 %	Assume 100% works area for heavy construction	
	Source ID:	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)	
	1 - 22, 24 - 52	No. of working days per month, d	26 days		
		No. of working hours per day, h	10 hour	Mon to Sat, 8:00 to 18:00	
		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3	
		Emission Rate	2.87393E-04 g/m²/s (unmitigated) 2.38536E-05 g/m²/s (mitigated)	=2.69*1000000/(10000*d*h*60*60)*p/100	
	Wind Erosion for	Percentage active area, p	100 %		
	Working Hours	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)	
	Source ID: Same as above	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4	
		Emission Rate	2.69533E-06 g/m²/s (unmitigated) 2.23713E-07 g/m²/s (mitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100	
	Wind Erosion for	Percentage active area, p	100 %		
	Non-Working Hours Source ID:	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4	
	Same as above				
		Emission Rate	2.69533E-06 g/m²/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100	

Work Area	Sources		Parameter	Remarks
Kong Nga Po	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
Roadworks - at	Source ID:	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)
grade	R24 - R40	No. of working days per month, d	26 days	
		No. of working hours per day, h	10 hour	Mon to Sat, 8:00 to 18:00
		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3
		Emission Rate	3.44872E-03 g/m/s (unmitigated)	Assume road width equals 12m, therefore multiply emission rate by 12m. =2.69*1000000/(10000*d*h*60*60)*p/100 * 12
			2.86244E-04 g/m/s (mitigated)	
	Wind Erosion for	Percentage active area, p	100 %	
	Working Hours	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)
	Source ID: Same as above	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
		Emission Rate	3.2344E-05 g/m/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100 *12
			2.68455E-06 g/m/s (mitigated)	, , ,
	Wind Erosion for	Percentage active area, p	100 %	
	Non-Working Hours Source ID: Same as above	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
		Emission Rate	3.2344E-05 g/m/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100 *12

### **Details of Dust Emission Sources for 1-hour TSP Assessment**

Description	Sources	Parameter	Е	mission Rate	Remarks
C&D Stockpile Area	Material handling and	Percentage open stockpile area, p		%	80% stockpiling area is covered by impervious sheets and all
'	storage piles				dusty material should be sprayed with water immediately prior to
	Source ID:				any loading or transfer operation so as to keep the dusty material
	23				wet.
		Particle size multiplier, k	0.74		k (particle size < 30µm)
		Moisture content, M		%	From engineer
		Average wind speed, U		m/s	from PATH mm5 data grids (25,43), (25,44), (25,45) and (26,44), maximum annual average wind speed for 2010
		Emission Factor, E	0.00011122	ka/Ma	E=k*0.0016*[(U/2.2)^1.3/(M/2)^1.4]
		Monthly output		m3/month	From engineer
		Maximum hourly output, op	·	m3/hr	26 days per month, 10 working hours per day
		, , , , , , , , , , , , , , , , , , , ,		Mg/hr	Assumed capacity of dump truck is 15,000kg/2,000kg/m <sup>3</sup> =7.5m <sup>3</sup> and 15 tons
		Area of stockpile, A	7,569	$m^2$	
		Emission Rate		g/m²/s (unmitigated)	Unmitigated Emission Rate=E*1000*op/(A*60*60)
				g/m²/s (mitigated)	Mitigated Emission Rate'=E*1000*op/(A*60*60)*p/100
	M/in d anapian	Descritors and stealing to area in	400	0/ /	
	Wind erosion	Percentage open stockpile area, p		% (unmitigated)	
	Source ID:			% (mitigated)	80% stockpiling area is covered by impervious sheets
	As above	Emission Factor		Mg/hectare/year	AP42, Section 11.9.4
		Emission Rate		g/m²/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100
1			5.39066E-07	g/m²/s (mitigated)	

Work Area	Sources		Parameter	Remarks	
Kong Nga Po	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction	
Concurrent Project:		Mitigation efficiency No. of working days per month, d	91.7 % 26 days	Assume water spraying 8 times a day (once every 1.25 hours)	
Crematorium and Related Facilities at		No. of working hours per day, h Emission Factor for TSP	10 hour 2.69 Mg/hectare/month of activity	Assume Mon to Sat, 8:00 to 18:00 AP42, Section 13.2.3.3	
Sandy Ridge Area Sources		Emission Rate	2.87393E-04 g/m²/s (unmitigated) 2.38536E-05 g/m²/s (mitigated)	=2.69*1000000/(10000*d*h*60*60)*p/100	
		Percentage active area, p Mitigation efficiency Emission Factor for TSP	100 % 91.7 % 0.85 Mg/hectare/year	Assume water spraying 8 times a day (once every 1.25 hours) AP42, Table 11.9-4	
	Same as above		Ç		
		Emission Rate	2.69533E-06 g/m²/s (unmitigated) 2.23713E-07 g/m²/s (mitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100	
	Non-Working Hours Source ID:	Percentage active area, p Emission Factor for TSP	100 % 0.85 Mg/hectare/year	AP42, Table 11.9-4	
	Same as above	Emission Rate	2.69533E-06 g/m²/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100	
	-	Percentage active area, p Mitigation efficiency	100 % 91.7 %	Assume 100% works area for heavy construction Assume water spraying 8 times a day (once every 1.25 hours)	
Columbarium	C1, C2, C4, C5, C9,	No. of working days per month, d No. of working hours per day, h	26 days 10 hour	Assume Mon to Sat, 8:00 to 18:00	
		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3	
Line Sources		Emission Rate (C1, C2)	8.62179E-03 g/m/s (unmitigated)	Assume road width equals 30m, therefore multiply emission rate by 30m. =2.69*1000000/(10000*d*h*60*60)*p/100 * 30	
			7.15609E-04 g/m/s (mitigated)		
		Emission Rate (C4, C5, C9)	5.74786E-03 g/m/s (unmitigated)	Assume road width equals 20m, therefore multiply emission rate by 20m. =2.69*1000000/(10000*d*h*60*60)*p/100 * 20	
			4.77073E-04 g/m/s (mitigated)	, , , , , , , , , , , , , , , , , , , ,	
		Emission Rate (C12, C13, C14)	4.31090E-03 g/m/s (unmitigated)	Assume road width equals 15m, therefore multiply emission rate by 15m. =2.69*1000000/(10000*d*h*60*60)*p/100 * 15	
			3.57804E-04 g/m/s (mitigated)		
		Percentage active area, p	100 %		
	Working Hours Source ID: Same as above	Mitigation efficiency Emission Factor for TSP	91.7 % 0.85 Mg/hectare/year	Assumed water spraying 4 times a day (once every 2.5 hours) AP42, Table 11.9-4	
		Emission Rate (C1, C2)	8.08600E-05 g/m/s (unmitigated) 6.71138E-06 g/m/s (mitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100 *30	
		Emission Rate (C4, C5, C9)	5.39066E-05 g/m/s (unmitigated) 4.47425E-06 g/m/s (mitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100 *20	
		Emission Rate (C12, C13, C14)	4.04300E-05 g/m/s (unmitigated) 3.35569E-06 g/m/s (mitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100 *15	
	Wind Erosion for Non-Working Hours Source ID:	Percentage active area, p Emission Factor for TSP	100 % 0.85 Mg/hectare/year	AP42, Table 11.9-4	
	Same as above	Emission Rate (C1, C2) Emission Rate (C4, C5, C9) Emission Rate (C12, C13, C14)	8.08600E-05 g/m/s (unmitigated) 5.39066E-05 g/m/s (unmitigated) 4.04300E-05 g/m/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100 *30 =0.85*1000000/(10000*365*24*60*60)*p/100 *20 =0.85*1000000/(10000*365*24*60*60)*p/100 *15	
Kong Nga Po Concurrent Project:	Heavy construction Source ID:	Percentage active area, p Mitigation efficiency	100 % 87.5 %	Assume 100% works area for heavy construction (From EIA) Water suppression 8 times a day (From EIA)	
		No. of working days per month, d	26 days	From EIA	
Organic Waste Treatment Facilities (Phase 2)	S2 - S7	No. of working hours per day, h Emission Factor for TSP	12 hour 2.69 Mg/hectare/month of activity	From EIA, assume Mon to Sat, 8:00 to 20:00 AP42, Section 13.2.3.3	
		Emission Rate	2.39494E-04 g/m²/s (unmitigated) 2.99368E-05 g/m²/s (mitigated)	=2.69*1000000/(10000*d*h*60*60)*p/100	
	Wind Erosion	Percentage active area, p	100 %		
	Source ID: Same as above	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4	
		Emission Rate	2.69533E-06 g/m²/s	=0.85*1000000/(10000*365*24*60*60)*p/100	

### **Details of Dust Emission Sources for 1-hour TSP Assessment**

Description	Sources	Parameter		mission Rate	Remarks
Kong Nga Po	Material handling and				From EIA:
Concurrent Project:	storage piles	Percentage open stockpile area, p	20	%	80% stockpiling area is covered by impervious sheets and all dusty material should be sprayed with water immediately prior to
Organic Waste Treatment Facilities					any loading or transfer operation so as to keep the dusty material wet.
(Phase 2)		Particle size multiplier, k	0.74		k (particle size < 30µm)
		Moisture content, M	5	%	Asuume made by engineer, worst case scenario
C&D Stockpile Area		Average wind speed, U	2.5	m/s	Annual mean wind speed from mm5 year 2010 (date 2 Jan to 30 Dec)
		Emission Factor, E	0.000387622	kg/Mg	E=k*0.0016*[(U/2.2)^1.3/(M/2)^1.4], AP42, Section 13.2.4.3 From engineer
		Maximum daily average output	106.8	m <sup>3</sup> /day	Total volume of output: 25,000 m <sup>3</sup> Anticipated dusty construction activities duration: 9 months (assume 26 working days per month)
		Maximum hourly average output, op	8.9	m <sup>3</sup> /hr	12 hours per day
				Mg/hr	Assume capacity of dump truck is 6m <sup>3</sup> and 15 tons
		Area of the stockpile, A	4012.08		Assumption made by consultant
		Emission Rate		g/m²/s (unmitigated)	Unmitigated Emission Rate=E*1000*op/(A*60*60)
			1.19467E-07	g/m²/s (mitigated)	Mitigated Emission Rate'=E*1000*op/(A*60*60)*p/100
	Wind erosion Source ID:	Percentage open stockpile area, p	100	% (unmitigated)	
			20	% (mitigated)	80% stockpiling area is covered by impervious sheets
	As above	Emission Factor		Mg/hectare/year	AP42, Table 11.9.4
		Emission Rate		g/m²/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100
			5.39066E-07	g/m²/s (mitigated)	

Details of Dust Emission Sources for Daily RSP (Tier 1)

Work Area	Sources Heavy construction		Parameter	Remarks Assume 100% works area for heavy construction	
Kong Nga Po		Percentage active area, p	100 %		
	Source ID:	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)	
	1 - 22, 24 - 52	No. of working days per month, d	26 days		
		No. of working hours per day, h	10 hour	Mon to Sat, 8:00 to 18:00	
		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3	
		% content of RSP	30 % of TSP		
		Emission Factor for RSP	0.81 Mg/hectare/year		
		Emission Rate for RSP	8.62179E-05 g/m²/s (unmitigated)	=2.69*0.3*1000000/(10000*d*h*60*60)*p/100	
			7.15609E-06 g/m²/s (mitigated)		
	Wind Erosion for	Percentage active area, p	100 %		
	Working Hours	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)	
	Source ID:	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4	
	Same as above	% content of RSP	30 % of TSP		
		Emission Factor for RSP	0.26 Mg/hectare/year		
		Emission Rate for RSP	8.086E-07 g/m²/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100	
			6.71138E-08 g/m²/s (mitigated)		
	Wind Erosion for	Percentage active area, p	100 %		
	Non-Working Hours	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4	
	Source ID:	% content of RSP	30 % of TSP		
	Same as above	Emission Factor for RSP	0.26 Mg/hectare/year		
	1	Emission Rate for RSP	8.086E-07 g/m²/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100	

Work Area	Sources		Parameter	Remarks
Kong Nga Po	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
Roadworks - at	Source ID:	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)
grade	R24 - R40	No. of working days per month, d	26 days	
		No. of working hours per day, h	10 hour	Mon to Sat, 8:00 to 18:00
		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3
		% content of RSP	30 % of TSP	
		Emission Factor for RSP	0.81 Mg/hectare/year	
				Assume road width equals 12m, therefore multiply emission
		Emission Rate for RSP	1.03462E-03 g/m/s (unmitigated)	rate by 12m.
				'=2.69*0.3*1000000/(10000*d*h*60*60)*p/100 * 12
			8.58731E-05 g/m/s (mitigated)	
	Wind Erosion for	Percentage active area, p	100 %	
	Working Hours	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)
	Source ID:	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
	Same as above	% content of RSP	30 % of TSP	
		Emission Factor for RSP	0.26 Mg/hectare/year	
		Emission Rate for RSP	9.7032E-06 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100 *12
			8.05365E-07 g/m/s (mitigated)	
	Wind Erosion for	Percentage active area, p	100 %	
	Non-Working Hours	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
	Source ID:	% content of RSP	30 % of TSP	
	Same as above	Emission Factor for RSP	0.26 Mg/hectare/year	
		Emission Rate for RSP	9.7032E-06 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100*12

## Details of Dust Emission Sources for Daily and Annual RSP Assessment

Description	Sources	Parameter	E	Emission Rate	Remarks
C&D Stockpile Area	Material handling and	Percentage open stockpile area, p	20	%	80% stockpiling area is covered by impervious sheets and all
	storage piles				dusty material should be sprayed with water immediately prior to
	Source ID:				any loading or transfer operation so as to keep the dusty material
	23				wet.
		Particle size multiplier, k	0.35		k (particle size < 10µm)
		Moisture content, M		%	From engineer
		Average wind speed, U	2.9	m/s	from PATH mm5 data grids (25,43), (25,44), (25,45) and (26,44), maximum annual average wind speed for 2010
		Emission Factor, E	5.2604E-05	kg/Mg	E=k*0.0016*[(U/2.2)^1.3/(M/2)^1.4]
		Monthly output	20,000	m3/month	From engineer
		Maximum hourly output, op	76.9	m3/hr	26 days per month, 10 working hours per day
			153.8	Mg/hr	Assumed capacity of dump truck is 15,000kg/2,000kg/m <sup>3</sup> =7.5m <sup>3</sup> and 15 tons
		Area of stockpile, A	7,569	$m^2$	
		Emission Rate	·	g/m²/s (unmitigated)	Unmitigated Emission Rate=E*1000*op/(A*60*60)
				g/m²/s (mitigated)	Mitigated Emission Rate'=E*1000*op/(A*60*60)*p/100
	Wind erosion	Percentage open stockpile area, p	100	% (unmitigated)	
		Fercentage open stockpile area, p		, ,	200/ stocknilling area is sovered by impervious sheets
	Source ID:	Emission Faster		% (mitigated)	80% stockpiling area is covered by impervious sheets
	As above	Emission Factor		Mg/hectare/year	AP42, Section 11.9.4
		Emission Rate		g/m²/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100
.1			5.39066E-07	g/m²/s (mitigated)	

Work Area	Sources		Parameter	Remarks
Ų	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
Concurrent Project:	Source ID:	Mitigation efficiency No. of working days per month, d	91.7 % 26 days	Assume water spraying 8 times a day (once every 1.25 hours)
Columbarium	C3, C6, C7, C8, C10,	No. of working days per month, d	10 hour	Assume Mon to Sat, 8:00 to 18:00
Crematorium and	C11	Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3
Related Facilities at		% content of RSP	30 % of TSP	
Sandy Ridge		Emission Factor for RSP Emission Rate for RSP	0.81 Mg/hectare/year 8.62179E-05 g/m²/s (unmitigated)	=2.69*0.3*1000000/(10000*d*h*60*60)*p/100
Area Sources		Zimosion rato ioi reoi	7.15609E-06 g/m²/s (mitigated)	2.00 0.0 1000000/(10000 d 11 00 00) p/100
			, , ,	
	Wind Erosion for Working Hours	Percentage active area, p Mitigation efficiency	100 % 91.7 %	Assume water spraying 8 times a day (once every 1.25 hours)
	Source ID:	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
	Same as above	% content of RSP	30 % of TSP	
		Emission Factor for RSP Emission Rate for RSP	0.26 Mg/hectare/year 8.086E-07 g/m²/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100
		EITHSSIOTI Rate for RSF	6.71138E-08 g/m²/s (mitigated)	-0.85 0.5 1000000/(10000 365 24 60 60) p/100
	Wind Erosion for	Percentage active area, p	100 %	AD42 Toble 44.0.4
	Non-Working Hours Source ID:	Emission Factor for TSP % content of RSP	0.85 Mg/hectare/year 30 % of TSP	AP42, Table 11.9-4
	Same as above	Emission Factor for RSP	0.26 Mg/hectare/year	
		Emission Rate for RSP	8.086E-07 g/m²/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100
Kong Nga Po	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
Concurrent Project:	Source ID:	Mitigation efficiency	91.7 %	Assume water spraying 8 times a day (once every 1.25 hours)
Columbarium	C1, C2, C4, C5, C9,	No. of working days per month, d No. of working hours per day, h	26 days 10 hour	Assume Mon to Sat, 8:00 to 18:00
	C12, C13, C14	Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3
Related Facilities at		% content of RSP	30 % of TSP	
Sandy Ridge		Emission Factor for RSP	0.81 Mg/hectare/year	Assume road width equals 30m, therefore multiply emission rate
Line Sources		Emission Rate (C1, C2)	2.58654E-03 g/m/s (unmitigated)	by 30m
		,		=2.69*0.3*1000000/(10000*d*h*60*60)*p/100 *30
			2.14683E-04 g/m/s (mitigated)	Assume road width equals 20m, therefore multiply emission rate
		Emission Rate (C4, C5, C9)	1.72436E-03 g/m/s (unmitigated)	by 20m
				=2.69*0.3*1000000/(10000*d*h*60*60)*p/100 *20
			1.43122E-04 g/m/s (mitigated)	Assume road width equals 15m, therefore multiply emission rate
		Emission Rate (C12, C13, C14)	1.29327E-03 g/m/s (unmitigated)	by 15m
		, , , , , ,		=2.69*0.3*1000000/(10000*d*h*60*60)*p/100 *15
			1.07341E-04 g/m/s (mitigated)	
	Wind Erosion for	Percentage active area, p	100 %	
	Working Hours	Mitigation efficiency	91.7 %	Assume water spraying 8 times a day (once every 1.25 hours)
	Source ID: Same as above	Emission Factor for TSP % content of RSP	0.85 Mg/hectare/year 30 % of TSP	AP42, Table 11.9-4
	Carrie as above	Emission Factor for RSP	0.26 Mg/hectare/year	
		Emission Rate (C1, C2)	2.42580E-05 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100 *30
		Emission Rate (C4, C5, C9)	2.01341E-06 g/m/s (mitigated) 1.61720E-05 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100 *20
		[21]	1.34228E-06 g/m/s (mitigated)	0.00 0.0 1000000/(10000 000 24 00 00) p/100 20
		Emission Rate (C12, C13, C14)	1.21290E-05 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100 *15
			1.00671E-06 g/m/s (mitigated)	
	Wind Erosion for	Percentage active area, p	100 %	
	Non-Working Hours	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
	Source ID: Same as above	% content of RSP Emission Factor for RSP	30 % of TSP 0.26 Mg/hectare/year	
	333 43 43070	Emission Rate (C1, C2)	2.42580E-05 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100 *30
		Emission Rate (C4, C5, C9)	1.61720E-05 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100 *20
		Emission Rate (C12, C13, C14)	1.21290E-05 g/m/s (unmitigated)	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100 *15
Kong Nga Po	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
Concurrent Project:	Source ID:	Mitigation efficiency No. of working days per month, d	87.5 % 26 days	Water suppression 8 times a day From EIA
	S2 - S7	No. of working hours per day, h	12 hour	From EIA, assume Mon to Sat, 8:00 to 20:00
Treatment Facilities		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3
(Phase 2)		% content of RSP Emission Factor for RSP	30 % of TSP 0.81 Mg/hectare/year	
		Emission Rate for RSP	7.18483E-05 g/m²/s (unmitigated)	=2.69*0.3*1000000/(10000*d*h*60*60)*p/100
			8.98104E-06 g/m²/s (mitigated)	
	Wind Erosion	Percentage active area, p	100 %	
	Source ID:			
	Same as above	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
		% content of RSP Emission Factor for RSP	30 % of TSP 0.26 Mg/hectare/year	
		Emission Rate for RSP	8.086E-07 g/m²/s	=0.85*0.3*1000000/(10000*365*24*60*60)*p/100
		<u> </u>		

Description	Sources	Parameter	Emis	ssion Rate	Remarks
Kong Nga Po	Material handling and				From EIA:
Concurrent Project:	storage piles				80% stockpiling area is covered by impervious sheets and all
	Source ID: S1 & S8	Percentage open stockpile area, p	20 %		dusty material should be sprayed with water immediately prior to
Organic Waste					any loading or transfer operation so as to keep the dusty material
Treatment Facilities					wet.
(Phase 2)		Particle size multiplier, k	0.35		k (particle size < 10μm)
		Moisture content, M	5 %		Asuume made by engineer, worst case scenario
C&D Stockpile Area		Average wind speed, U	2.5 m/s	S	Annual mean wind speed from mm5 year 2010 (date 2 Jan to 30 Dec)
		Emission Factor, E	0.000183335 kg/l	/Mg	E=k*0.0016*[(U/2.2)^1.3/(M/2)^1.4] From engineer
		Maximum daily average output	106.8 m <sup>3</sup> /	/day	Total volume of output: 25,000 m <sup>3</sup> Anticipated dusty construction activities duration: 9 months (assume 26 working days per month)
		Maximum hourly average output, op	8.9 m <sup>3</sup> /	/hr	12 hours per day
		Area of the stockpile, A Emission Rate	22 Mg/ 4012.08 m <sup>2</sup> 2.82524E-07 g/m 5.65048E-08 g/m	m²/s (unmitigated)	Assume capacity of dump truck is 6m <sup>3</sup> and 15 tons Assumption made by consultant Unmitigated Emission Rate=E*1000*op/(A*60*60) Mitigated Emission Rate'=E*1000*op/(A*60*60)*p/100
	Wind erosion	Percentage open stockpile area, p		(unmitigated)	
	l			(mitigated)	80% stockpiling area is covered by impervious sheets
	As above	Emission Factor		g/hectare/year	AP42, Table 11.9.4
		Emission Rate	2.69533E-06 g/m 5.39066E-07 g/m	n²/s (unmitigated) n²/s (mitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100

Details of Dust Emission Sources for Daily FSP (Tier 1)

Work Area	Sources Heavy construction		Parameter	Remarks Assume 100% works area for heavy construction	
Kong Nga Po		Percentage active area, p	100 %		
	Source ID:	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)	
	1 - 22, 24 - 52	No. of working days per month, d	26 days		
		No. of working hours per day, h	10 hour	Mon to Sat, 8:00 to 18:00	
		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3	
		% content of FSP	3 % of TSP		
		Emission Factor for FSP	0.08 Mg/hectare/year		
		Emission Rate for FSP	8.62179E-06 g/m²/s (unmitigated)	=2.69*0.03*1000000/(10000*d*h*60*60)*p/100	
			7.15609E-07 g/m²/s (mitigated)		
	Wind Erosion for	Percentage active area, p	100 %		
	Working Hours	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)	
	Source ID:	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4	
	Same as above	% content of FSP	3 % of TSP		
		Emission Factor for FSP	0.03 Mg/hectare/year		
		Emission Rate for FSP	8.086E-08 g/m²/s (unmitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100	
			6.71138E-09 g/m²/s (mitigated)		
	Wind Erosion for	Percentage active area, p	100 %		
	Non-Working Hours	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4	
	Source ID:	% content of FSP	3 % of TSP		
	Same as above	Emission Factor for FSP	0.03 Mg/hectare/year		
		Emission Rate for FSP	8.086E-08 g/m²/s (unmitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100	

Work Area	Sources		Parameter	Remarks
Kong Nga Po	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
Roadworks - at	Source ID:	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)
grade	R24 - R40	No. of working days per month, d	26 days	
		No. of working hours per day, h	10 hour	Mon to Sat, 8:00 to 18:00
		Emission Factor for TSP	2.69 Mg/hectare/month of activity	AP42, Section 13.2.3.3
		% content of FSP	3 % of TSP	
		Emission Factor for FSP	0.08 Mg/hectare/year	
				Assume road width equals 12m, therefore multiply emission
		Emission Rate for FSP	1.03462E-04 g/m/s (unmitigated)	rate by 12m.
				'=2.69*0.03*1000000/(10000*d*h*60*60)*p/100 * 12
			8.58731E-06 g/m/s (mitigated)	
	Wind Erosion for	Percentage active area, p	100 %	
	Working Hours	Mitigation efficiency	91.7 %	Water spraying 8 times a day (once every 1.25 hours)
	Source ID:	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
	Same as above	% content of FSP	3 % of TSP	
		Emission Factor for FSP	0.03 Mg/hectare/year	
		Emission Rate for FSP	9.7032E-07 g/m/s (unmitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *12
			8.05365E-08 g/m/s (mitigated)	
	Wind Erosion for	Percentage active area, p	100 %	
	Non-Working Hours	Emission Factor for TSP	0.85 Mg/hectare/year	AP42, Table 11.9-4
	Source ID:	% content of FSP	3 % of TSP	, , <u></u>
	Same as above	Emission Factor for FSP	0.03 Mg/hectare/year	
		Emission Rate for FSP	9.7032E-07 g/m/s (unmitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *12
			5 55_E 57 g,5 (aaga.63)	1.55 5.55 1.5555557 (1.5555 555 E.1. 55 557 p/ 100 12

## Details of Dust Emission Sources for Daily and Annual FSP Assessment

Description	Sources	Parameter	Emission Rate		Remarks
C&D Stockpile Area	Material handling and	Percentage open stockpile area, p	20	%	80% stockpiling area is covered by impervious sheets and all dusty
	storage piles				material should be sprayed with water immediately prior to any
	Source ID:				loading or transfer operation so as to keep the dusty material wet.
	23				
		Particle size multiplier, k	0.053		k (particle size < 2.5μm)
		Moisture content, M	14	%	From engineer
		Average wind speed, U	2.9	m/s	from PATH mm5 data grids (25,43), (25,44), (25,45) and (26,44), maximum annual average wind speed for 2010
		Emission Factor, E	7.96575E-06	kg/Mg	E=k*0.0016*[(U/2.2)^1.3/(M/2)^1.4]
		Monthly output	20,000	m3/month	From engineer
		Maximum hourly output, op	76.9	m3/hr	26 days per month, 10 working hours per day
			153.8	Mg/hr	Assumed capacity of dump truck is 15,000kg/2,000kg/m <sup>3</sup> =7.5m <sup>3</sup> and 15 tons
		Area of stockpile, A	7,569	$m^2$	
		Emission Rate		g/m²/s (unmitigated)	Unmitigated Emission Rate=E*1000*op/(A*60*60)
			8.99502E-09	g/m²/s (mitigated)	Mitigated Emission Rate'=E*1000*op/(A*60*60)*p/100
	Wind erosion	Percentage open stockpile area, p	100	% (unmitigated)	
	Source ID:	l crocinage open stockpile area, p		% (mitigated)	80% stockpiling area is covered by impervious sheets
	As above	Emission Factor		Mg/hectare/year	AP42, Section 11.9.4
	AS above	Emission Rate		g/m²/s (unmitigated)	=0.85*1000000/(10000*365*24*60*60)*p/100
		Linission rate		g/m²/s (mitigated)	-0.00 1000000/(10000 000 24 00 00) p/100

Work Area	Sources		Parameter	Remarks
Kong Nga Po	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
	Source ID:	Mitigation efficiency No. of working days per month, d	91.7 % 26 days	Assume water spraying 8 times a day (once every 1.25 hours)
Crematorium and Related Facilities at	C3, C6, C7, C8, C10, C11	No. of working hours per day, h Emission Factor for TSP % content of FSP	10 hour 2.69 Mg/hectare/month of activity 3 % of TSP	Assume Mon to Sat, 8:00 to 18:00 AP42, Section 13.2.3.3
Sandy Ridge Area Sources		Emission Factor for FSP Emission Rate for FSP	0.08 Mg/hectare/year 8.62179E-06 g/m²/s (unmitigated) 7.15609E-07 g/m²/s (mitigated)	=2.69*0.03*1000000/(10000*d*h*60*60)*p/100
	Wind Erosion for Working Hours Source ID: Same as above	Percentage active area, p Mitigation efficiency Emission Factor for TSP % content of FSP	100 % 91.7 % 0.85 Mg/hectare/year 3 % of TSP	Assume water spraying 8 times a day (once every 1.25 hours) AP42, Table 11.9-4
	Same as above	Emission Factor for FSP Emission Rate for FSP	0.03 Mg/hectare/year 8.086E-08 g/m²/s (unmitigated) 6.71138E-09 g/m²/s (mitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100
	Wind Erosion for Non-Working Hours Source ID: Same as above	Percentage active area, p Emission Factor for TSP % content of FSP Emission Factor for FSP	100 % 0.85 Mg/hectare/year 3 % of TSP 0.03 Mg/hectare/year	AP42, Table 11.9-4
	Same as above	Emission Rate for FSP	8.086E-08 g/m²/s (unmitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100
	Heavy construction	Percentage active area, p	100 %	Assume 100% works area for heavy construction
,	Source ID:	Mitigation efficiency No. of working days per month, d	91.7 % 26 days	Assume water spraying 8 times a day (once every 1.25 hours)
Crematorium and Related Facilities at	C1, C2, C4, C5, C9, C12, C13, C14	No. of working hours per day, h Emission Factor for TSP % content of FSP	10 hour 2.69 Mg/hectare/month of activity 3 % of TSP	Assume Mon to Sat, 8:00 to 18:00 AP42, Section 13.2.3.3
Sandy Ridge Line Sources		Emission Factor for FSP Emission Rate (C1, C2)	0.08 Mg/hectare/year 2.58654E-04 g/m/s (unmitigated)	Assume road width equals 30m, therefore multiply emission rate by 30m =2.69*0.03*1000000/(10000*d*h*60*60)*p/100 *30
			2.14683E-05 g/m/s (mitigated)	Assume road width equals 20m, therefore multiply emission rate
		Emission Rate (C4, C5, C9)	1.72436E-04 g/m/s (unmitigated)	by 20m =2.69*0.03*1000000/(10000*d*h*60*60)*p/100 *20
			1.43122E-05 g/m/s (mitigated)	Assume road width equals 15m, therefore multiply emission rate
		Emission Rate (C12, C13, C14)	1.29327E-04 g/m/s (unmitigated)	by 15m =2.69*0.03*1000000/(10000*d*h*60*60)*p/100 *15
			1.07341E-05 g/m/s (mitigated)	
	Wind Erosion for Working Hours Source ID: Same as above	Percentage active area, p Mitigation efficiency Emission Factor for TSP % content of FSP	100 % 91.7 % 0.85 Mg/hectare/year 3 % of TSP	Assume water spraying 8 times a day (once every 1.25 hours) AP42, Table 11.9-4
		Emission Factor for FSP Emission Rate (C1, C2)	0.03 Mg/hectare/year 2.42580E-06 g/m/s (unmitigated) 2.01341E-07 g/m/s (mitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *30
		Emission Rate (C4, C5, C9)	1.61720E-06 g/m/s (unmitigated) 1.34228E-07 g/m/s (mitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *20
		Emission Rate (C12, C13, C14)	1.21290E-06 g/m/s (unmitigated) 1.00671E-07 g/m/s (mitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *15
	Wind Erosion for Non-Working Hours Source ID: Same as above	Percentage active area, p Emission Factor for TSP % content of FSP Emission Factor for FSP	100 % 0.85 Mg/hectare/year 3 % of TSP 0.03 Mg/hectare/year	AP42, Table 11.9-4
	came as above	Emission Rate (C1, C2) Emission Rate (C4, C5, C9) Emission Rate (C12, C13, C14)	2.42580E-06 g/m/s (unmitigated) 1.61720E-06 g/m/s (unmitigated) 1.21290E-06 g/m/s (unmitigated)	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *30 =0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *20 =0.85*0.03*1000000/(10000*365*24*60*60)*p/100 *15
Concurrent Project:	Heavy construction Source ID:	Percentage active area, p Mitigation efficiency No. of working days per month, d	100 % 87.5 % 26 days	Assume 100% works area for heavy construction Water suppression 8 times a day From EIA
Organic Waste Treatment Facilities (Phase 2)	S2 - S7	No. of working hours per day, h Emission Factor for TSP % content of FSP Emission Factor for FSP	12 hour 2.69 Mg/hectare/month of activity 3 % of TSP 0.08 Mg/hectare/year	From EIA, assume Mon to Sat, 8:00 to 20:00 AP42, Section 13.2.3.3
		Emission Rate for FSP	7.18483E-06 g/m²/s (unmitigated) 8.98104E-07 g/m²/s (mitigated)	=2.69*0.03*1000000/(10000*d*h*60*60)*p/100
	Wind Erosion Source ID:	Percentage active area, p	100 %	
	Same as above	Emission Factor for TSP % content of FSP	0.85 Mg/hectare/year 3 % of TSP	AP42, Table 11.9-4
		Emission Factor for FSP Emission Rate for FSP	0.03 Mg/hectare/year 8.086E-08 g/m²/s	=0.85*0.03*1000000/(10000*365*24*60*60)*p/100

Description	Sources	Parameter	Emission Rate		Remarks	
Kong Nga Po Concurrent Project: Organic Waste Treatment Facilities	Material handling and storage piles Source ID: S1 & S8	Percentage open stockpile area, p	20	%	From EIA: 80% stockpiling area is covered by impervious sheets and all dusty material should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.	
(Phase 2) C&D Stockpile Area		Particle size multiplier, k Moisture content, M Average wind speed, U		% m/s	k (particle size < 2.5µm) Asuume made by engineer, worst case scenario Annual mean wind speed from mm5 year 2010 (date 2 Jan to 30	
		Emission Factor, E  Maximum daily average output	2.77621E-05 106.8	kg/Mg m³/day	Dec)  E=k*0.0016*[(U/2.2)^1.3/(M/2)^1.4]  From engineer  Total volume of output: 25,000 m <sup>3</sup> Anticipated dusty construction activities duration: 9 months	
		Maximum hourly average output, op		m <sup>3</sup> /hr	(assume 26 working days per month)  12 hours per day	
		Area of the stockpile, A Emission Rate	4012.08 4.27822E-08	Mg/hr m <sup>2</sup> g/m <sup>2</sup> /s (unmitigated) g/m <sup>2</sup> /s (mitigated)	Assume capacity of dump truck is 6m³ and 15 tons Assumption made by consultant Unmitigated Emission Rate=E*1000*op/(A*60*60) Mitigated Emission Rate'=E*1000*op/(A*60*60)*p/100	
	Wind erosion As above	Percentage open stockpile area, p Emission Factor Emission Rate	20 0.85 2.69533E-06	% (unmitigated) % (mitigated) Mg/hectare/year g/m²/s (unmitigated) g/m²/s (mitigated)	80% stockpiling area is covered by impervious sheets AP42, Table 11.9.4 =0.85*1000000/(10000*365*24*60*60)*p/100	