

Appendix 3.02a Construction of CSTW - Calculation of Dust Emission Source (Short-term Prediction (Tier 1))

Construction of CSTW

Emission rates for Short-term Average Prediction (Tier 1)

Location	Source	Emission Rates	(Unmitigated)	(Mitigated)	Parameters	Remarks			
Portal Exhaust	Exhaust Outlets during Construction of Cavern Source ID: 1	Overall Emission Rate (during construction hours)	1.276610E-01	1.505583E-02	TSP Emission Rate	Overall Emission Rate for Heavy Construction, Loading, Screen and Crushing (With Enclosure and Dust Collector for dust suppression on Rock Crusher) Emission Rate = (Construction Activities + Rock Loading + Rock Crushing + Screening) / Area of Exhaust			
		Volume Source (g/s-m ²)	6.068147E-02	7.124385E-03	RSP Emission Rate				
			1.263393E-02	1.118443E-03	FSP Emission Rate				
	Construction Activities inside Cavern	Heavy Construction (g/s)		3.067374E+01	3.834217E+00	Emission Rate = (Emission Factor*10*6/10000)/(30*No. of Operation hour*60)*(Percentage Active/100)*Construction Area*(1-Dust Suppression%) TSP emission factor (Mg/hectare/month of activity) Percentage area actively operating (%) % of dust suppression no. of operation hour (hr) Emission height (m) Total Construction Area in Cavern (m ²)	256 2.69 from AP-42, S13.2.3, 1/95 ed. 100 Full strength (Tier 1 Test) 87.5 Assuming watering eight times a day, reference to Kai Tak Development EIA Report 12 Assumed typical working hours of work site referenced in AP-42 0.5 147781 from engineer		
				1.45087E+01	1.81358E+00	RSP emission factor (Mg/hectare/month of activity) RSP-to-TSP Ratio	1.27237 0.473 from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4		
				2.20851E+00	2.76064E-01	FSP emission factor (Mg/hectare/month of activity) FSP-to-TSP Ratio	0.19368 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 Multiplier*(1-Dust Suppression%) RSP emission factor (kg/Mg) TSP-to-RSP factor Loading rate (ton/hr) no. of operation hour (hr) % of dust suppression	0.000008 from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1 2.1 from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1 1600 from engineer 12 from engineer (from 0700 to 1900) 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) % of dust suppression	0.000008 from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1 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 emission factor (kg/Mg) % of dust suppression	0.000008 adopt RSP emission factor as upper limit 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
						1.20000E+00	1.20000E-02	Emission Rate = Emission Factor*Processing Rate*1000/3600*(1-Dust Suppression%) TSP emission factor (kg/Mg) Crushing rate (ton/hr) no. of operation hour (hr) % of dust suppression	0.0027 from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1 1600 from engineer 12 from engineer (from 0700 to 1900) 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) % of dust suppression	0.0012 from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1 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 emission factor (kg/Mg) % of dust suppression	0.0012 adopt RSP emission factor as upper limit 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

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Emission rates for Short-term Average Prediction (Tier 1)

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) Crushing rate (ton/hr) no. of operation hour (hr) % of dust suppression	0.0018 from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1 1600 from engineer 12 from engineer (from 0700 to 1900) 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) % of dust suppression	0.0011 from EPA AP-42, 5th ed. 8/04 ed., S11.19.2 Table 11.19.2-1 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 emission factor (kg/Mg) % of dust suppression	0.0011 adopt RSP emission factor as upper limit 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) Percentage area actively operating (%) % of dust suppression no. of operation hour (hr) Emission height (m)	2.69 from AP-42, S13.2.3, 1/95 ed. 100 Full strength (Tier 1 Test) 87.5 Assuming watering eight times a day, reference to Kai Tak Development EIA Report 12 Assumed typical working hours of work site referenced in AP-42 0.5
			9.81767E-05	1.22721E-05	RSP emission factor (Mg/hectare/month of activity) % fraction of TSP	1.27237 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) % fraction of TSP	0.19368 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) Percentage area actively operating (%) Emission height (m)	0.85 AP-42, 5th ed., Table 11.9.4 100 Full strength (Tier 1 Test) 0.5
				1.27489E-06	RSP emission factor (Mg/hectare/month of activity) % fraction of TSP	0.40205 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) % fraction of TSP	0.0612 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) Percentage area actively operating (%) % of dust suppression no. of operation hour (hr) Emission height (m)	2.69 from AP-42, S13.2.3, 1/95 ed. 100 Full strength (Tier 1 Test) 87.5 Assuming watering eight times a day, reference to Kai Tak Development EIA Report 12 Assumed typical working hours of work site referenced in AP-42 0.5
			9.81767E-05	1.22721E-05	RSP emission factor (Mg/hectare/month of activity) % fraction of TSP	1.27237 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) % fraction of TSP	0.19368 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) Percentage area actively operating (%) Emission height (m)	0.85 AP-42, 5th ed., Table 11.9.4 100 Full strength (Tier 1 Test) 0.5
				1.27489E-06	RSP emission factor (Mg/hectare/month of activity) % fraction of TSP	0.40205 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) % fraction of TSP	0.0612 0.072 from USEPA AP-42, 5th ed. 11/06 ed. S13.2.4

Appendix 3.02a Construction of CSTW - Calculation of Dust Emission Source (Short-term Prediction (Tier 1))

Construction of CSTW

Emission rates for Short-term Average Prediction (Tier 1)

Location	Source	Emission Rates	(Unmitigated)	(Mitigated)	Parameters	Remarks					
Construction Sites at Ah Kung Kok Shan Road Surface Magazine Site	Construction Activities Source ID: 40 - 69	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)						
					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 1 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					
	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 1 Test)						
			Emission height (m)	0.5							
			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						
				1.27489E-06	0.40205	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	0.0612	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 Connecting Main Portal to Area 73	Unpaved Haul Road (assumed as Heavy Construction as worst case) Source ID: 70 - 82	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)						
					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 1 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					
	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 1 Test)						
			Emission height (m)	0.5							
			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						
				1.27489E-06	0.40205	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	0.0612	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

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Construction of CSTW

Emission rates for Short-term Average Prediction (Tier 1)

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)				
					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 1 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						
		Wind Erosion Area Source (g/m ² /s)	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
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 1 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					

PROJECT
項目

RELOCATION OF SHA TIN
SEWAGE TREATMENT
WORKS TO CAVERNS:
CAVERNS AND SEWAGE
TREATMENT WORKS -
INVESTIGATION, DESIGN
AND CONSTRUCTION

CLIENT
業主



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ISSUE/REVISION
發行

I/R	DATE	DESCRIPTION	CHK.
發行	日期	內容摘要	核實
A	JAN. 16	EIA	
-	SEP. 15	EIA (DRAFT)	

STATUS
階段

SCALE **DIMENSION UNIT**
比例 尺寸單位

N.T.S. METRES

KEY PLAN
索引圖

PROJECT NO. **CONTRACT NO.**
項目編號 合約編號

60334056 CE 30/2014 (DS)

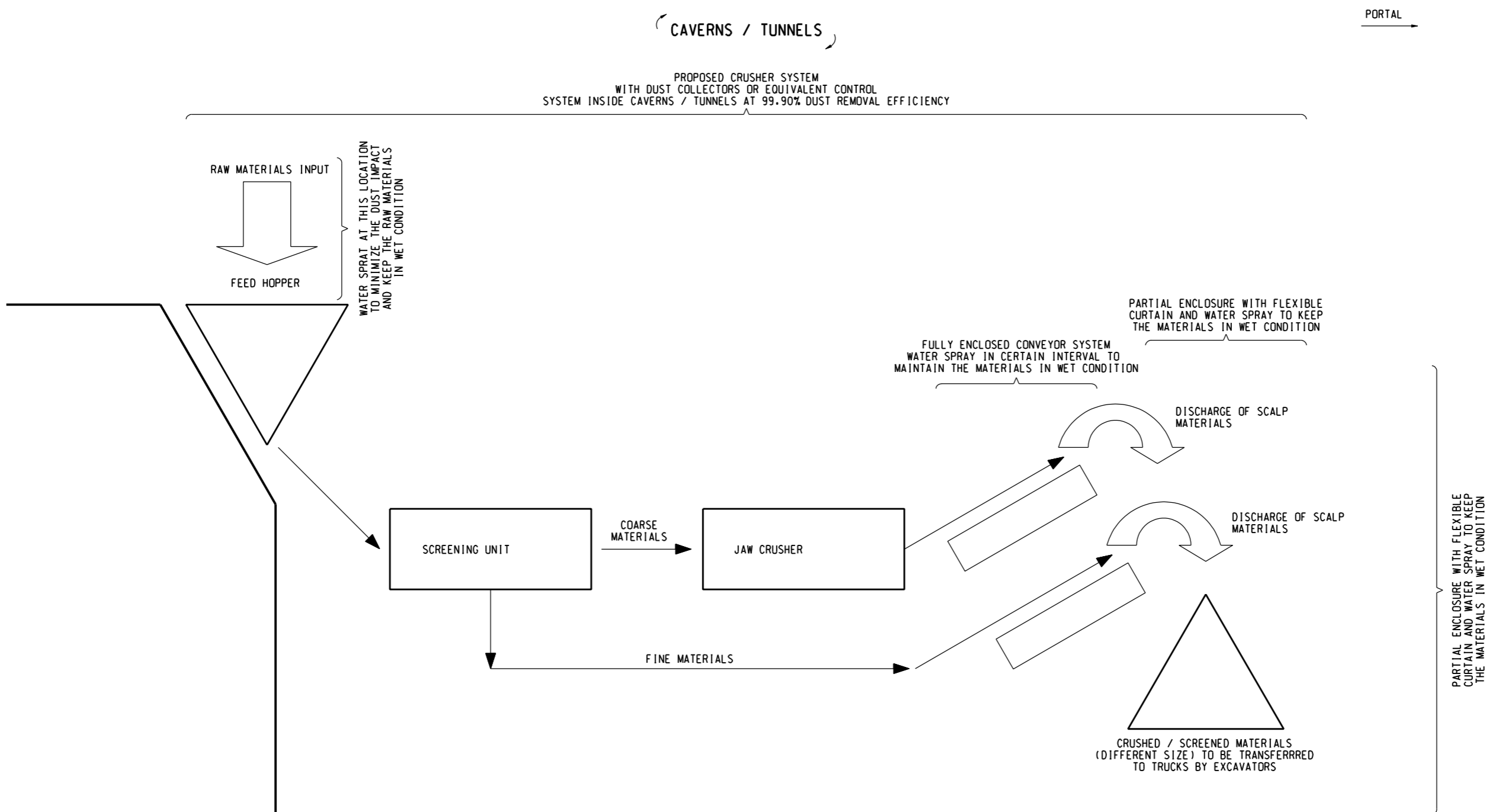
SHEET TITLE
圖紙名稱

SCHEMATIC FLOW DIAGRAM
FOR THE PROPOSED
CRUSHING PLANT

SHEET NUMBER
圖紙編號

60334056/EIA/3.38A

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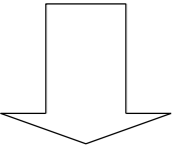


CAVERNS / TUNNELS

PORTAL →

PROPOSED CRUSHER SYSTEM
WITH DUST COLLECTORS OR EQUIVALENT CONTROL
SYSTEM INSIDE CAVERNS / TUNNELS AT 99.90% DUST REMOVAL EFFICIENCY

RAW MATERIALS INPUT



FEED HOPPER

WATER SPRAY AT THIS LOCATION
TO MINIMIZE THE DUST IMPACT
AND KEEP THE RAW MATERIALS
IN WET CONDITION

SCREENING UNIT

COARSE MATERIALS

JAW CRUSHER

FINE MATERIALS

FULLY ENCLOSED CONVEYOR SYSTEM
WATER SPRAY IN CERTAIN INTERVAL TO
MAINTAIN THE MATERIALS IN WET CONDITION

PARTIAL ENCLOSURE WITH FLEXIBLE
CURTAIN AND WATER SPRAY TO KEEP
THE MATERIALS IN WET CONDITION

DISCHARGE OF SCALP
MATERIALS

DISCHARGE OF SCALP
MATERIALS

PARTIAL ENCLOSURE WITH FLEXIBLE
CURTAIN AND WATER SPRAY TO KEEP
THE MATERIALS IN WET CONDITION

CRUSHED / SCREENED MATERIALS
(DIFFERENT SIZE) TO BE TRANSFERRED
TO TRUCKS BY EXCAVATORS