Appendix 4.1 - Active Works Area and TSP Emission Burden Calculation

Project Type	Heavy Construction Activities (Main Dust Generation)	From	To	TSP Emission Factor (g/m^2/s)	Active Working Area (m^2)	2018											
						1	2	3	4	5	6	7	8	9	10	11	12
The Cavern Project	Site formation for Cavern																
	*Mobilization and Site Clearance	JAN-18	MAR-18	-	2500	2500	2500	2500									
	*Portal Slopes Excavation and Stabilisation Works	APR-18	JUL-18	-	2500				2500	2500	2500	2500					
	*Cavern Excavation and Temporary Installation	AUG-18	MAY-19	-	2500								2500	2500	2500	2500	2500
	*Permanent Cavern (and adits) Lining Construction	JUN-19	OCT-19	-	2500												
	*Soft Landscaping & Finishing Works	NOV-19	JAN-20	-	-												
TSP Emission Calculation	Heavy Construction (Working Hours Only)			2.076E-04	Total Area (m^2)	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
	Wind Erosion (Working Hours and Non-Working Hours)			2.695E-06		2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
	Total TSP Emission from Heavy Construction (Working Hours Only)				(kg/month)	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5
	Total TSP Emission from Wind Erosion (Working Hours and Non-Working Hours)				(kg/month)	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
	Total TSP Emission in one Month (kg/month)					690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5
	Total TSP Emission in one Year (tonne/year)					8.3											

Note:

(1) Detail breakdown of construction activities are represented by an asterisk (*).

(2) Emission from source type (kg) = Area (m2) x Emission Factor of source type (g /m2/s) x 1/1000 (kg/g) x 60 (s/ min) x 60 (min / hr) x Operation Hours (hr/ day) x Number of days (day/ mth)

(3) Total Emission = Emission from Heavy Construction + Emission from Wind Erosion

(4) Construction Dust Impact from Soft Landscaping & Finishing Works (NOV-19 to JAN-20) is expected to be minimal.

Appendix 4.1 - Active Works Area and TSP Emission Burden Calculation

Project Type	Heavy Construction Activities (Main Dust Generation)	From	To	TSP Emission Factor (g/m^2/s)	Active Working Area (m^2)	2019											
						1	2	3	4	5	6	7	8	9	10	11	12
The Cavern Project	Site formation for Cavern																
	*Mobilization and Site Clearance	JAN-18	MAR-18	-	2500												
	*Portal Slopes Excavation and Stabilisation Works	APR-18	JUL-18	-	2500												
	*Cavern Excavation and Temporary Installation	AUG-18	MAY-19	-	2500	2500	2500	2500	2500	2500							
	*Permanent Cavern (and adits) Lining Construction	JUN-19	OCT-19	-	2500						2500	2500	2500	2500	2500		
	*Soft Landscaping & Finishing Works	NOV-19	JAN-20	-	-											-	-
TSP Emission Calculation	Heavy Construction (Working Hours Only)			2.076E-04	Total Area (m^2)	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	0	0
	Wind Erosion (Working Hours and Non-Working Hours)			2.695E-06		2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	0	0
	Total TSP Emission from Heavy Construction (Working Hours Only)				(kg/month)	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5	672.5	0.0	0.0
	Total TSP Emission from Wind Erosion (Working Hours and Non-Working Hours)				(kg/month)	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	0.0	0.0
	Total TSP Emission in one Month (kg/month)					690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	690.5	0.0	0.0
	Total TSP Emission in one Year (tonne/year)					6.9											

Note:

(1) Detail breakdown of construction activities are represented by an asterisk (*).

(2) Emission from source type (kg) = Area (m2) x Emission Factor of source type (g /m2/s) x 1/1000 (kg/g) x 60 (s/ min) x 60 (min / hr) x Operation Hours (hr/ day) x Number of days (day/ mth)

(3) Total Emission = Emission from Heavy Construction + Emission from Wind Erosion

(4) Construction Dust Impact from Soft Landscaping & Finishing Works (NOV-19 to JAN-20) is expected to be minimal.

Appendix 4.1 - Active Works Area and TSP Emission Burden Calculation

Project Type	Heavy Construction Activities (Main Dust Generation)	From	To	TSP Emission Factor (g/m^2/s)	Active Working Area (m^2)	2020											
						1	2	3	4	5	6	7	8	9	10	11	12
The Cavern Project	Site formation for Cavern																
	*Mobilization and Site Clearance	JAN-18	MAR-18	-	2500												
	*Portal Slopes Excavation and Stabilisation Works	APR-18	JUL-18	-	2500												
	*Cavern Excavation and Temporary Installation	AUG-18	MAY-19	-	2500												
	*Permanent Cavern (and adits) Lining Construction	JUN-19	OCT-19	-	2500												
	*Soft Landscaping & Finishing Works	NOV-19	JAN-20	-	-	-											
TSP Emission Calculation	Heavy Construction (Working Hours Only)			2.076E-04	Total Area (m^2)	0	0	0	0	0	0	0	0	0	0	0	0
	Wind Erosion (Working Hours and Non-Working Hours)			2.695E-06		0	0	0	0	0	0	0	0	0	0	0	0
	Total TSP Emission from Heavy Construction (Working Hours Only)				(kg/month)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TSP Emission from Wind Erosion (Working Hours and Non-Working Hours)				(kg/month)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TSP Emission in one Month (kg/month)					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TSP Emission in one Year (tonne/year)					0.0											

Note:

(1) Detail breakdown of construction activities are represented by an asterisk (*).

(2) Emission from source type (kg) = Area (m2) x Emission Factor of source type (g /m2/s) x 1/1000 (kg/g) x 60 (s/ min) x 60 (min / hr) x Operation Hours (hr/ day) x Number of days (day/ mth)

(3) Total Emission = Emission from Heavy Construction + Emission from Wind Erosion

(4) Construction Dust Impact from Soft Landscaping & Finishing Works (NOV-19 to JAN-20) is expected to be minimal.