



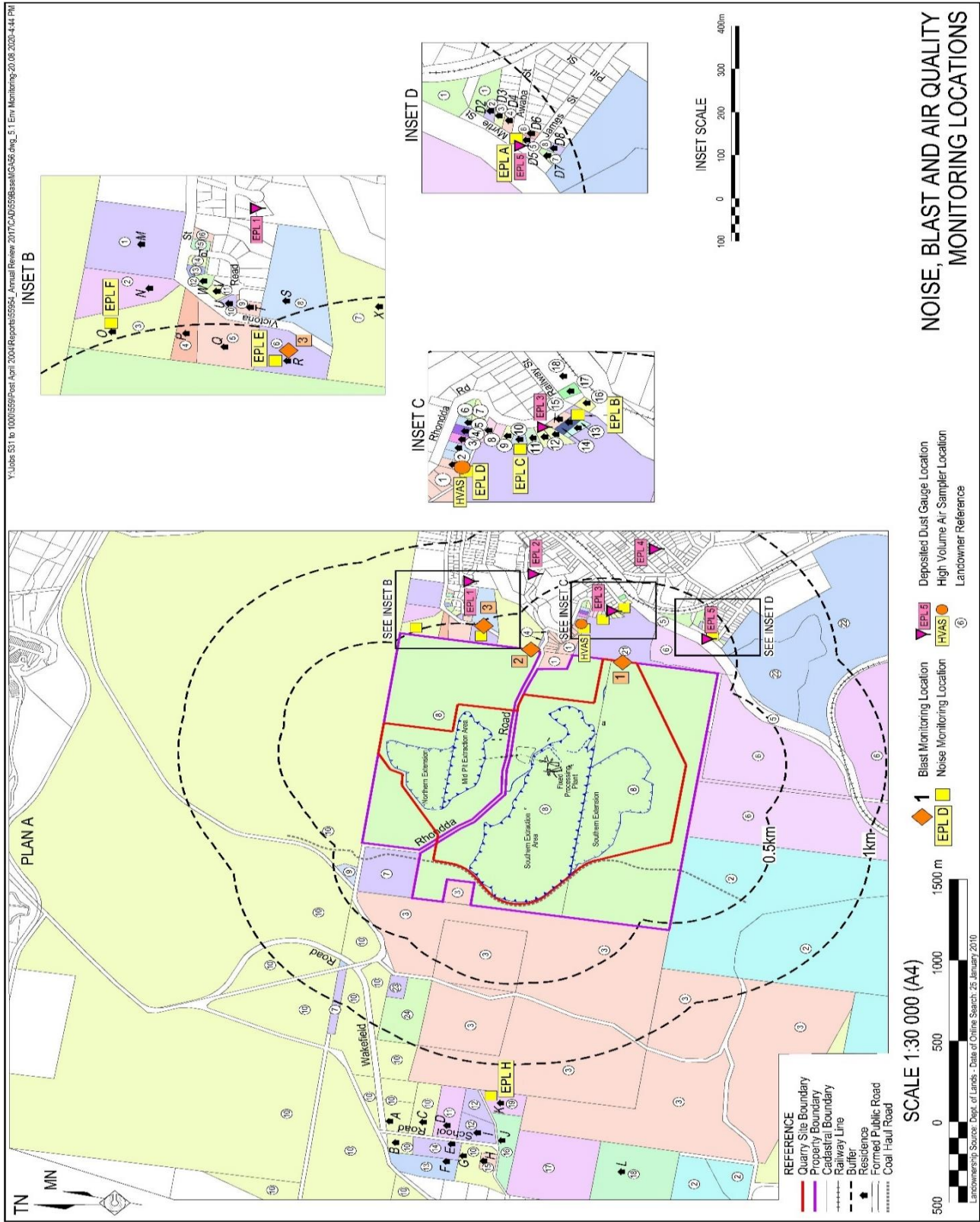
Teralba Quarry Environmental Monitoring Summary

October 2021

Environmental Protection Licence (EPL):	536
Licensee:	Metromix Pty Limited
Licensee Address:	PO Box 1295 Parramatta, NSW 2124
Premises:	Metromix Pty Limited Teralba Quarry Rhondra Road Teralba, NSW 2284
Licensee Website:	https://www.metromix.com.au/
Licensee Website - Monitoring Results:	https://www.metromix.com.au/resources/#quarry
EPA Public Register:	https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers
Prepared by:	R. W. Corkery & Co.
Sample Period:	October 2021
Data Last Received	15 November 2021
Date of Report	17 November 2021

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Deposited Dust

Sample Period Start: 1/10/2021
Sample Period End: 1/11/2021
Sample Frequency: 30 ± 2 days
Sample Collected By: Metromix - GS
Date Received by Laboratory: 1/11/2021
Date Results Received by Metromix: 9/11/2021

EPA Identification No.	Location	Criteria (g/m ² /month)	Insoluble Solids (g/m ² /month)	Ash Fraction (g/m ² /month)	% Ash Fraction
1	Hillside Crescent	4.0	0.7	0.4	57%
8	Rodgers Street	4.0	1.0	0.5	50%
9	Rhondda Road	4.0	1.9	0.8	42%
11	Myrtle Street	4.0	2.0	0.7	35%
23	York Street	4.0	1.8	0.9	50%

Comments

All deposited dust results remained below the approved criteria for the sample period.

Deposited Dust - Year to Date

	Rhondda Road			Myrtle Street			Hillside Crescent			Rodgers Street			York Street		
	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash
Units	g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month	
EPA Approved Level	4.0			4.0			4.0			4.0			4.0		
January	0.7	0.4	57	1.0	0.5	50	0.7	0.3	43	0.7	0.4	57	1.2	0.7	58
February	0.3	0.2	67	0.4	0.2	50	0.4	0.2	50	0.5	0.3	60	0.4	0.4	100
March	0.6	0.2	33	0.5	0.2	40	0.8	0.2	25	0.5	0.2	40	0.9	0.5	56
April	0.3	0.2	67	0.2	0.1	50	0.4	0.1	25	0.2	0.2	100	0.4	0.3	75
May	0.3	0.1	33	0.4	0.3	75	0.4	0.2	50	0.2	0.1	50	0.8	0.6	75
June	0.4	0.2	50	0.3	0.2	67	0.1	0.1	100	0.2	0.2	100	0.5	0.4	80
July	1.8	0.7	39	0.5	0.3	60	0.1	0.1	100	0.7	0.4	57	0.7	0.4	57
August	0.9	0.6	67	1.0	0.7	70	0.1	0.1	100	0.6	0.5	83	0.4	0.3	75
September	1.2	0.7	58	0.9	0.4	44	0.1	0.1	100	0.6	0.3	50	0.6	0.4	67
October	1.9	0.8	42	2.0	0.7	35	0.7	0.4	57	1.0	0.5	50	1.8	0.9	50
November															
December															
Annual Average	0.8	0.4	51.3	0.7	0.4	54.1	0.4	0.2	65.0	0.5	0.3	64.7	0.8	0.5	69.3
Annual Maximum	1.9	0.8	67.0	2.0	0.7	75.0	0.8	0.4	100.0	1.0	0.5	100.0	1.8	0.9	100.0
Annual Minimum	0.3	0.1	33.0	0.2	0.1	35.0	0.1	0.1	25.0	0.2	0.1	40.0	0.4	0.3	50.0

Particulate Matter (PM₁₀)

Sample Location: EPA 3 - Rodgers Road
 Sample Frequency: 6 days

Date Sample Taken (24-hr)	Collected by	Date Results Received	PM ₁₀ µg/m ³	Monthly Average Criteria (µg/m ³)	Annual Average Criteria (µg/m ³)
6/10/2021	CBased - LK	18/10/2021	16	50	
12/10/2021	CBased - TD	21/10/2021	7	50	
18/10/2021	CBased - MB	28/10/2021	15	50	
24/10/2021	CBased - MB	4/11/2021	13	50	
30/10/2021	CBased -MB	11/11/2021	16	50	
Monthly Average			13.3		25/30*

*Project Approval (PA 10_0183) outlines the annual average PM₁₀ criteria to be 30µg/m³. However, EPL 536 Condition R4.5a) requires that the air quality monitoring data is assessed against the Air Impact Assessment Criteria outlined in EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*. The most up to date version of this guideline was published in 2017 and outlines the annual average PM₁₀ criteria to be 25µg/m³. Metromix has considered both criteria for its review of particulate matter monitoring.

Comments

All PM₁₀ results remained below the approved criteria for the sample period.

Particulate Matter (PM₁₀) - Year to Date

Date	PM ₁₀ (µg/m ³)	Monthly Average (µg/m ³)	Year to Date Average (µg/m ³)	24-Hr Criteria (µg/m ³)	Comments
3/01/2021	10	18.0	10.0	50	
9/01/2021	5		7.5	50	
15/01/2021	37		17.3	50	
21/01/2021	18		17.5	50	
27/01/2021	20		18.0	50	
2/02/2021	11	10.0	16.8	50	
8/02/2021	6		15.2	50	
14/02/2021	12		14.8	50	
20/02/2021	7		14.0	50	
26/02/2021	14		14.0	50	
4/03/2021	9	9.0	13.5	50	
10/03/2021	14		13.6	50	
16/03/2021	8		13.1	50	
22/03/2021	6		12.6	50	
28/03/2021	8		12.3	50	
3/04/2021	5	11.1	11.9	50	
9/04/2021	10		11.7	50	
15/04/2021	17		12.0	50	
21/04/2021	14		12.1	50	
27/04/2021	10		12.0	50	
3/05/2021	11	8.0	12.0	50	
9/05/2021	10		11.9	50	
15/05/2021	8		11.7	50	
21/05/2021	10		11.6	50	
27/05/2021	2		11.2	50	
2/06/2021	15	9.2	11.4	50	
8/06/2021	12		11.4	50	
14/06/2021	6		11.2	50	
20/06/2021	12		11.2	50	
26/06/2021	2		10.9	50	
2/07/2021	9	7.5	10.8	50	
8/07/2021	6		10.7	50	
14/07/2021	8		10.6	50	
20/07/2021	6		10.5	50	
26/07/2021	9		10.4	50	
1/08/2021	35	15.1	11.1	50	
7/08/2021	10		11.1	50	
13/08/2021	12		11.1	50	
19/08/2021	18		11.3	50	
25/08/2021	3		11.0	50	
31/08/2021	13		11.1	50	
6/09/2021	8	14	11.0	50	
12/09/2021	24		11.3	50	
18/09/2021	14		11.4	50	
24/09/2021	16		11.5	50	
30/09/2021	8		11.4	50	
6/10/2021	16	13	11.5	50	
12/10/2021	7		11.4	50	
18/10/2021	15		11.4	50	
24/10/2021	13		11.5	50	
30/10/2021	16		11.6	50	

Minimum	2
Maximum	35
Average	11.4
Standard Deviation	6.3
24-hr Criteria	50
Number of Exceedences	0
Annual Average Criteria	25/30*
Annual Average Criteria Exceeded	No

*See explanation on previous page.

Water**Water Monitoring****EPL Point 4 - Monthly Monitoring**

Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	
6/09/2021	08:00am	Metromix - AL	5/10/2021		7.48	2180	8	<5	-

EPL Point 5 - Monitoring Within 12 Hours of Commencing Discharge

Drinking Water Monitoring Within 12 Hours of Commencing Discharge									
Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	
No discharge occurred at this location and therefore no monitoring was required									

EPL Point 6 - Monthly Monitoring

Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	
No discharge occurred at this location and therefore no monitoring was required									

EPL Point 7 - Monthly Monitoring

2.2.10.1 Monthly Monitoring									
Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	
No discharge occurred at this location and therefore no monitoring was required									

Flow Meter Records

EPA Identified Point	Location	Description	Sample Period	Daily Average Flow ML	Monthly Total Flow ML
4	Adit Dam	Adit Dam to Creek (off site)	1/10/2021 to 1/11/2021	1.21	37.62
5	Dam B	Discharge from Dam B (from Quarry)	1/10/2021 to 1/11/2021	N/A	0
4	Adit Dam	Water pumped from Adit Dam to Dam G (processing use)	1/10/2021 to 1/11/2021	3.77	116.80

Comments

All water monitoring results remained within the approved criteria levels during the monitoring period.

Water - Year to Date**EPL Point 4 : Monthly Monitoring**

	pH	EC	TSS	Oil & Grease	Comments
Units	pH Units	µS/cm	mg/L	mg/L	-
EPL Criterion*	6.5-8.5	NA	<50	10	-
ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	<5	-
January	7.18	1890	6	<5	-
February	7.11	1880	<5	<5	-
March	7.16	1800	8	6	-
April	7.07	1600	6	<5	-
May	7.12	1680	8	<5	-
June	7.49	1940	26	<5	-
July	7.32	1970	<5	<5	-
August	7.34	1960	<5	<5	-
September	7.30	2050	<5	<5	-
October	7.48	2180	8	<5	-
November					
December					

EPL Point 5 : Monitoring During Discharge

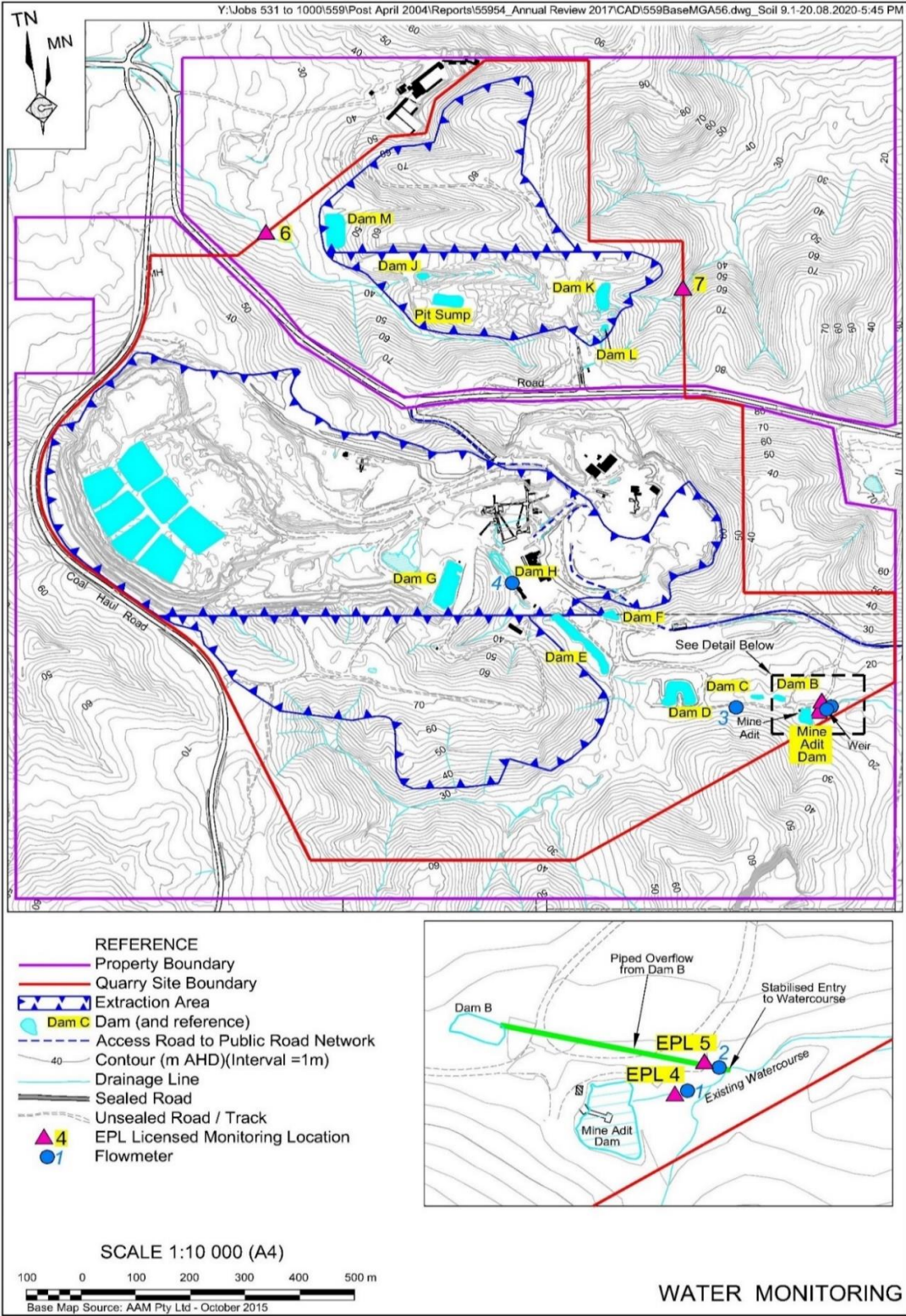
	pH	EC	TSS	Oil & Grease	Comments
Units	pH Units	µS/cm	mg/L	mg/L	-
EPL Criterion*	6.5-8.5	NA	<50	10	-
ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	-
4/01/2021	7.24	862	6	<5	-
1/02/2021	7.40	921	<5	<5	-
11/02/2021	7.32	1140	<5	<5	-
1/04/2021	6.67	793	<5	<5	-
3/05/2021	6.83	771	<5	<5	-

Flow Meter Records

EPA Identifier	Location	Description	Date	Monthly Total (ML)
4	Adit Dam	Water pumped from Adit Dam to Dam G (processing use)	4/01/2021 - 1/02/2021	80.9
			1/02/2021 - 1/03/2021	94.8
			1/03/2021 - 1/04/2021	88.5
			1/04/2021 - 3/05/2021	91.4
			3/05/2021 - 1/06-2021	107.8
			1/06/2021 - 1/07/2021	91.8
			1/07/2021 - 2/08/2021	92.9
			2/08/2021 - 1/09/2021	99.0
			1/092021 - 1/10/2021	115.5
			1/10/2021 - 1/11/2021	116.8

EPA Identified	Location	Description	Date	Monthly Total (ML)
5	Dam B	Discharge from Dam B (from Quarry)	4/01/2021 - 1/02/2021	0.0
			1/02/2021 - 1/03/2021	0.0
			1/03/2021 - 1/04/2021	28.3
			1/04/2021 - 3/05/2021	3.7
			3/05/2021 - 1/06-2021	0.0
			1/06/2021 - 1/07/2021	0.0
			1/07/2021 - 2/08/2021	0.0
			2/08/2021 - 1/09/2021	0.0
			1/09/2021 - 1/10/2021	0.0
			1/10/2021 - 1/11/2021	0.0

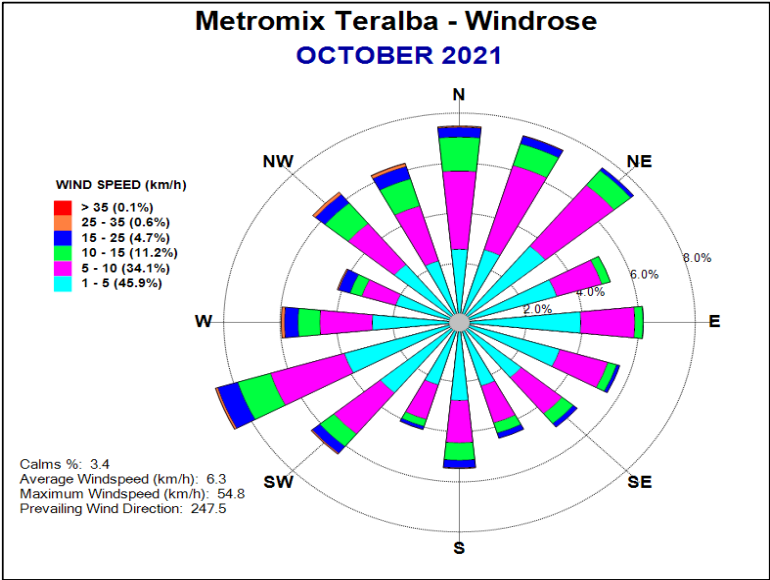
EPA Identified	Location	Description	Date	Monthly Total (ML)
4	Adit Dam	Adit Dam to Creek (off site)	4/01/2021 - 1/02/2021	33.5
			1/02/2021 - 1/03/2021	94.9
			1/03/2021 - 1/04/2021	271.1
			1/04/2021 - 3/05/2021	142.1
			3/05/2021 - 1/06-2021	65.7
			1/06/2021 - 1/07/2021	74.1
			1/07/2021 - 2/08/2021	29.1
			2/08/2021 - 1/09/2021	28.1
			1/092021 - 1/10/2021	30.5
			1/10/2021 - 1/11/2021	37.6



Meteorological Conditions

Monitoring Location: Mid-Pit Entrance
Monitoring Frequency: Continuous

Windrose



Monthly Summary

Date	Mean Wind	Mean Wind	Daily Rainfall (mm)	Mean Sigma Theta	Max Temperature	Min Temperature
01/10/21	189	6.3	13	27.1	25.8	13.2
02/10/21	232	5.4	0	37.5	24.6	12.6
03/10/21	240	6.9	0	37.7	26.6	13.6
04/10/21	183	8.3	0	31.9	28.8	16.8
05/10/21	258	10.6	0	25.7	23.4	12.4
06/10/21	183	6.4	0	31.9	26.0	10.2
07/10/21	224	9.4	0	32.3	30.2	14.2
08/10/21	106	5.3	0	34.3	22.2	14.8
09/10/21	125	6.5	0	27.0	31.2	12.6
10/10/21	166	8.9	28.2	30.7	34.0	16.0
11/10/21	198	6.1	16.4	34.3	16.2	11.2
12/10/21	119	4.7	26.4	33.0	16.4	11.6
13/10/21	86	5.5	9.6	27.8	18.4	13.4
14/10/21	94	6.6	8	25.9	28.0	14.0
15/10/21	200	10.2	0	31.9	22.4	12.0
16/10/21	251	11.0	0	42.9	22.4	11.4
17/10/21	189	4.7	0	33.9	23.2	11.1
18/10/21	162	4.0	0	28.4	26.2	11.4
19/10/21	189	6.1	2.8	31.9	28.0	13.0
21/10/21	194	5.0	1	34.0	21.8	10.8
21/10/21	153	4.3	0	31.3	23.0	13.0
22/10/21	151	4.1	0	32.0	24.4	15.0
23/10/21	171	4.4	3.4	27.5	32.8	14.0
24/10/21	176	5.7	0	36.5	21.8	15.8
25/10/21	204	4.7	0	33.2	24.6	12.4
26/10/21	152	4.5	0	35.5	23.6	12.4
27/10/21	167	4.5	0	29.7	29.2	14.6
28/10/21	154	4.2	0	28.8	32.4	15.4
29/10/21	204	10.6	0	29.8	32.8	19.4
30/10/21	174	6.6	5.4	35.4	22.2	12.4

Meteorological Conditions - Year to Date

Monitored Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total Rainfall (mm)	130.0	135.0	362.8	24.0	25.0	55.2	22.4	63.8	46.2	114.2			
Average Minimum Temperature (°C) at 2m	18.1	18.2	17.2	13.1	11.6	9.1	8.6	9.7	11.1	13.3			
Average Maximum Temperature (°C) at 2m	28.6	26.4	25.5	23.3	20.7	17.4	17.5	20.4	23.3	25.3			
Average Minimum Temperature (°C) at 10m	18.5	18.5	17.5	13.9	12.3	9.7	9.2	10.6	11.7	13.8			
Average Maximum Temperature (°C) at 10m	27.3	25.4	24.7	22.5	20.0	16.9	17.0	19.8	22.4	24.3			
Average Sigma Theta	30.9	32.2	31.9	27.3	27.0	28.3	29.8	28.4	29.1	31.9			
Average Solar Radiation (W/m ²)	214.6	183.9	137.7	148.3	104.6	88.7	101.7	127.5	172.3	199.1			
Average Relative Humidity (%)	71.7	77.0	75.0	66.0	68.0	69.0	62.0	57.0	58.0	61.0			

Blasting

Monitoring Frequency: Each Blast
Blast Monitoring Completed By: Orica (Blast 1 to 12)
MAXAM (Blast 13)

Shot #	Day	Month	Time	Location	Location 1		Location 2		Location 3		Comments
					Overpressure dB(L)	Vibration mm/s	Overpressure dB(L)	Vibration mm/s	Overpressure dB(L)	Vibration mm/s	
1	22	January	11:52:04	Stage 2A	101.7	0.2	NT	NT	NM	NM	The trigger parameters for the blast monitors were reduced to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 111.7dBL overpressure and 0.35mm/s vibration.
2	11	February	14:50:06	Stage 2A	105.6	0.37	102.3	0.08	NM	NM	
3	17	February	12:50:00	Stage 2A	109.7	1.43	NT	NT	NM	NM	
4	11	March	13:42:00	Stage 2A	101.5	0.24	NT	NT	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 110.6dBL overpressure and 0.55mm/s vibration. The Rhondda Road monitor was tested prior to blasting and recorded readings of 102.2dBL(via clapping) and 7.31mm/s (via stomping).
6A & 6B	7	April	14:56:49	Stage 2A	NT	NT	111.2	0.16	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading.
5	14	April	13:36:13	Stage 1C	106.3	0.3	100.8	0.05	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 113.3dBL overpressure and 0.54mm/s vibration.
7	5	May	11:44:23	Stage 2A	NT	NT	101	0.12	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 108.5dBL overpressure and 0.35mm/s vibration.
8	25	May	14:38:00	Stage 2A	100.2	2.61	105.9	0.16	NM	NM	
9	3	June	12:58:38	Stage 2A	103.1	0.1	99.9	0.12	NM	NM	
10	17	June	14:04:00	Stage 1C	NT	NT	104	0.12	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 109.4dBL overpressure and 0.22mm/s vibration.
11	23	June	14:17:06	Stage 2A	108.8	0.11	103.2	0.12	NM	NM	
12	30	June	15:01:11	Stage 2A	103.1	0.08	NT	NT	NM	NM	
13	14	July	13:05:06	Stage 2A	105	0.45	100.4	0.3	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 109.5dBL overpressure and 1.36mm/s vibration.
14	22	July	13:24:00	Stage 1C	NT	NT	NT	NT	NM	NM	
15	27	July	12:15:00	Stage 2A	NT	NT	NT	NT	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 107.9dBL overpressure and 0.20mm/s vibration.
16A & 16B	9	August	12:52:17	Stage 2A	102.9	0.22	NT	NT	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 108.7dBL overpressure and 0.25mm/s vibration.
17	20	August	15:12:21	Stage 2A	103.9	0.3	NT	NT	NM	NM	
18	30	August	15:12:21	Stage 2B	NT	NT	NT	NT	NM	NM	
19	14	September	14:30:00	Stage 2A	107.5	0.3	102.4	0.1	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 114.7dBL overpressure and 0.54mm/s vibration.
20	24	September	13:57:19	Stage 1C	NT	NT	101.9	0.12	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 112.9dBL overpressure and 0.37mm/s vibration.
21	6	October	14:54:03	Stage 2A	100.4	0.43	96.1	0.23	NM	NM	
22	20	October	15:44:22	Stage 1C	103.4	0.18	NT	NT	NM	NM	The trigger parameters for the blast monitors were set to 100dBL and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 108.2dBL overpressure and 0.29mm/s vibration.

NT Not Triggered
NM Not Monitored

Blasting Criteria			
Parameter	Units of Measure	Limit	
		95% of blasts per year	100% of blasts
Airblast Overpressure (Linear Peak)	decibels (dBL)	115	120
Ground Vibration (Peak Particle Velocity)	millimetres per second (mm/s)	5	10

Comments
Two blasting events occurred during the monitoring period. All blast monitoring results were within the approved criteria.

Waste Management**Waste Removal Summary**

Month	January	February	March	April	May	June	July	August	September	October	November	December
Items	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity
General Waste Bin (10m ³)												
General Waste Bin (4.5m ³)												
General Waste Bin (6m ³)												
General Waste Bin (20m ³)	1				1		1		1			
Paper & Cardboard Bin (3m ³)	1	1		1	1	1	1		1			
Shredded Paper Bin (240L)									2			
Co Mingled Recycling (2 x 240 L)	4	4	6	4	4	4	4	4	4	4		
Tonner Cartridges												
Waste Oil (L)			1800			800		2000		600		
Scrap Steel (t)												
Timber (m ³)												
Engine Coolant (L)												
Oil Filters (240L bin)		3	1					3	3			
Batteries			15									
Oily Rags (240L bin)					1							
Aerosols (120L bin)												
Tyres												
Other												
Oily Water (L)												
Grease Waste (L)												