

Monthly Environmental Monitoring Report

February 2018

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Table of Contents

1. Introduction.....	2
2. Monitoring Requirements.....	2
3. Dust Depositional Monitoring.....	5
4. Total Suspended Particulates.....	7
5. Real Time PM ₁₀ Monitoring.....	7
6. Surface Water Monitoring.....	10
7. Groundwater Monitoring.....	11
8. Noise Monitoring.....	12
9. Blast Monitoring.....	12
10. Meteorological Monitoring.....	12

1. Introduction

The Mount Pleasant Operation (MPO) is located in the Upper Hunter Valley of New South Wales, approximately three kilometres (km) north-west of Muswellbrook and approximately 50 km north-west of Singleton. The villages of Aberdeen and Kayuga are located 12 km north-northeast and 3 km north of the Project boundary, respectively.

The purpose of this Report is to provide a monthly update of monitoring data in accordance with the requirements of Environmental Protection Licence (EPL) 20850, Section 66(6) of the POEO Act and the MPO Project Approval DA 92/97.

Table 1-1 – Mount Pleasant Operations

Name of Operation	Mount Pleasant Operation
Name of Licensee	MACH Energy Australia Pty Ltd
Environmental Protection Licence	20850
Reporting Period Start Date	1 February 2018
Reporting Period End Date	28 February 2018
Date Data Received	22 March 2018

To view MPO EPL 20850 in full please refer to the link below.

<http://www.environment.nsw.gov.au>

2. Monitoring Requirements

The MPO Environment Protection Licence (EPL) 20850 specifically requires the monitoring of:

- 2 x Palas Fidas PM10 sites;
- Noise monitoring
- Blast monitoring; and
- Meteorological monitoring.

Monitoring of sites not required by the EPL are carried out in accordance with MPO Environmental Monitoring Program (EMP) and Project Approval DA 92/97.

The MPO Environmental Monitoring Network is shown on **Figure 2-1 and Figure 2-2**.

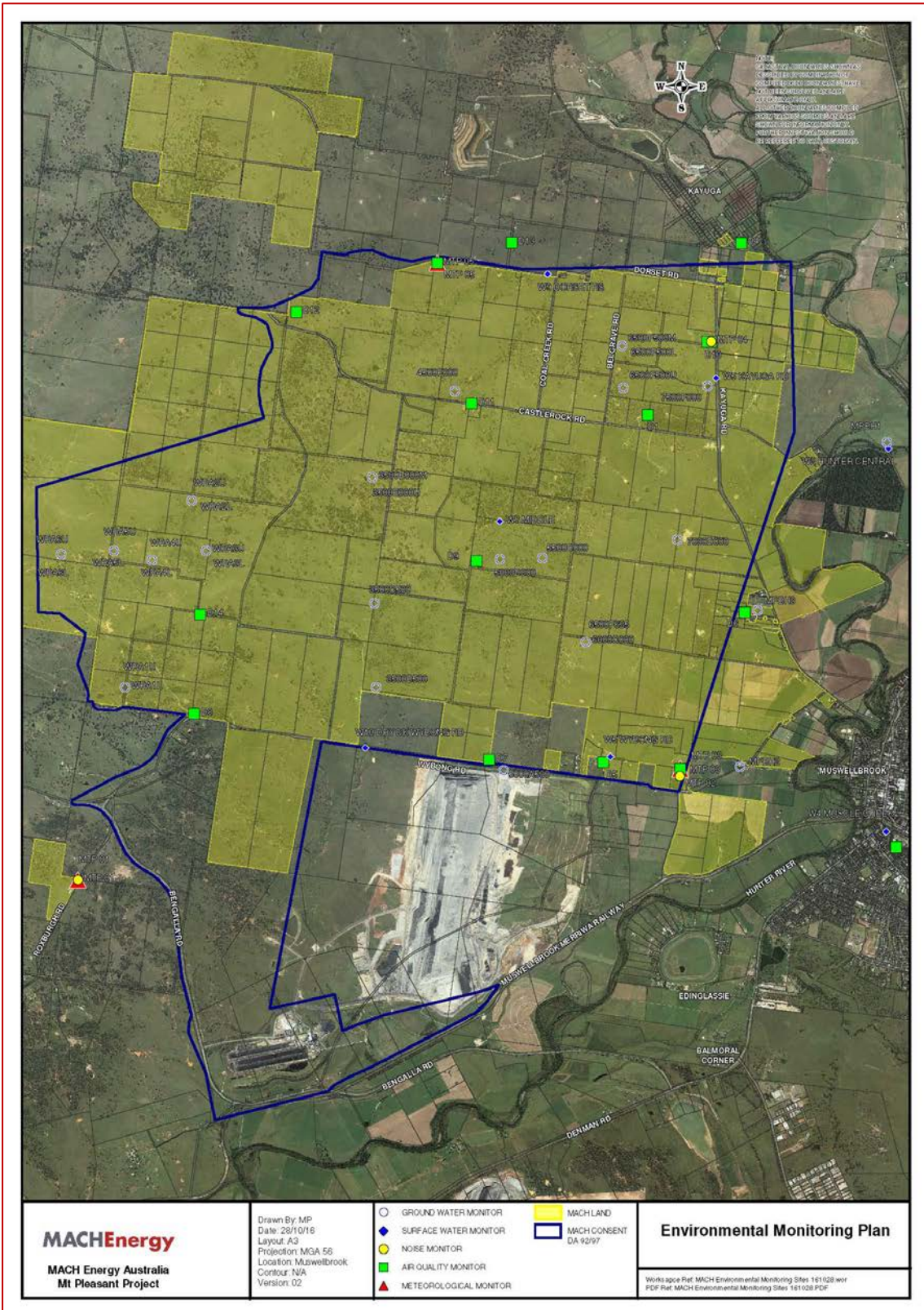


Figure 2-1 – MPO Environmental Monitoring Network

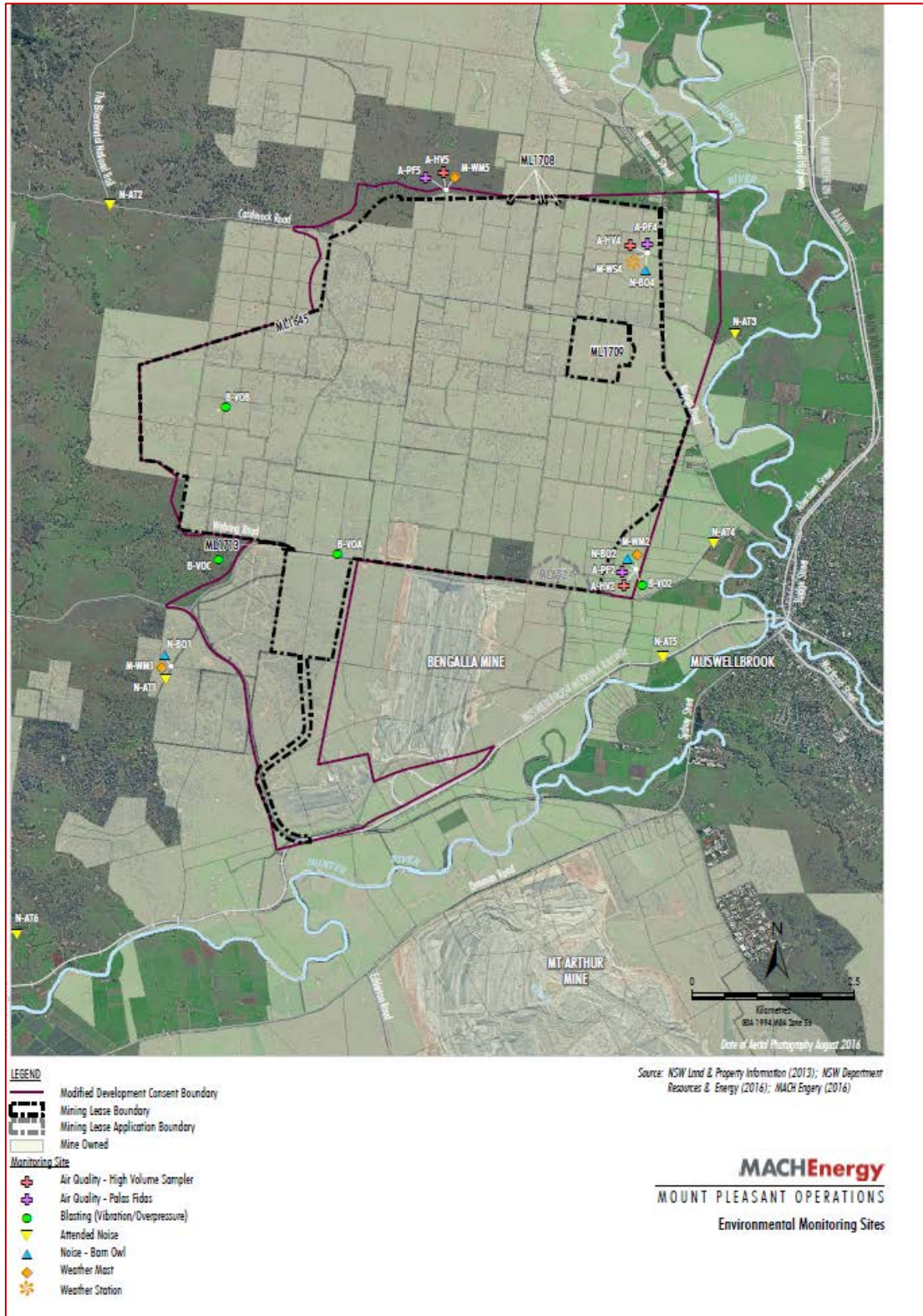


Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

3. Dust Depositional Monitoring

Dust deposition was monitored according to the OEH's Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC 2007), which references AS/NZS 3580.10.1:2003 (R2014) Determination of particulate matter – Deposited matter – Gravimetric Method. The dust deposition exposure period for all gauges commenced on 19 January 2018. Sample collection was undertaken on 19 February 2018 by AECOM with sample analysis performed by SRT NATA accredited laboratory. The monitoring network comprises of 13 dust deposition gauges (DDG). Results for February 2018 are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results – February 2018

Location	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
D1	1.5	1.2
D3	2.9	2.0
D4	1.6	1.2
D5	2.1	N/A*
D6	2.5	2.6
D7	7.8	N/A*
D8	4.0	4.3
D9	1.3	1.6
D10	1.6	1.3
D11	1.3	1.6
D12	0.9	0.8
D13	1.9	3.1
D14	3.4	2.6
<i>Criterion</i>	-	4

* Sites D5a and D7a were installed in September 2017. Insoluble solids annual rolling average data is not available.

Note: Contaminated results are not included in the 12 month rolling average. Monthly results above 4g/m²/month are not classed as an exceedance of criteria as the criteria is an annual average of 4g/m²/month. **Figure 3-1** compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.

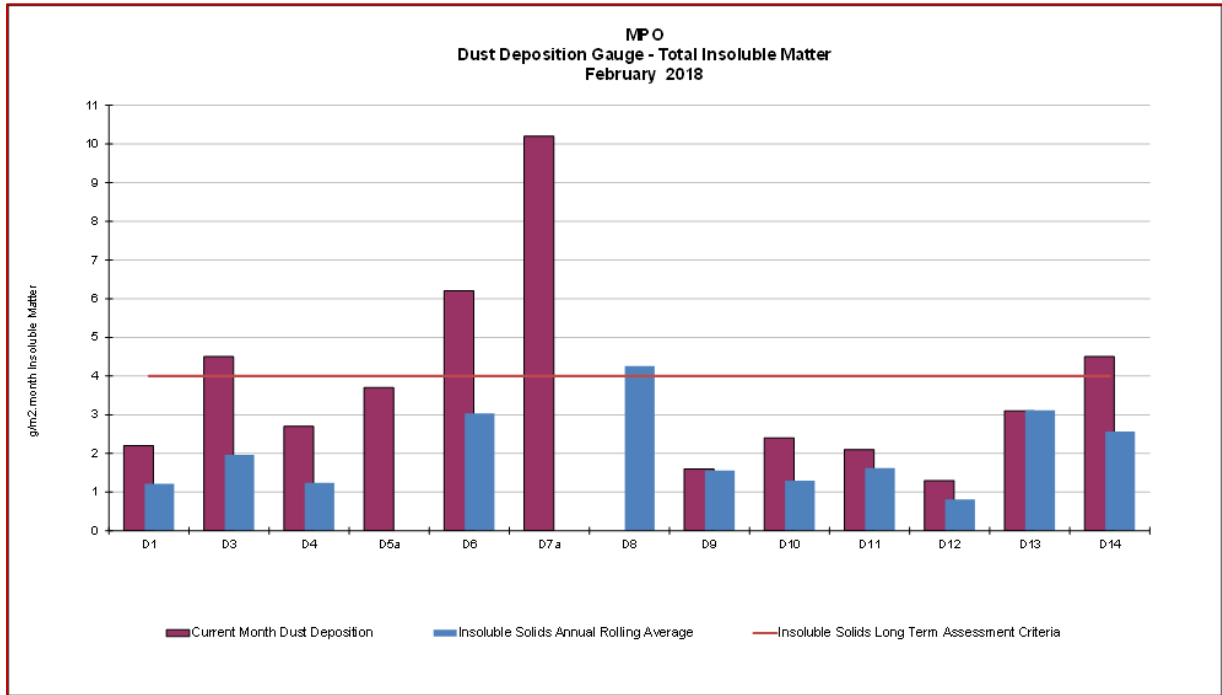


Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – February 2018

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at site D8 (4.3 g/m².month). DDG water for D8 was recorded in field notes as being grey and turbid. The gauge contained insects and vegetation. Also, the monthly dust deposition result of 5.5 g/m²/month exceeded the annual average result at this site (4.3 g/m²/month) and as such the sample was considered likely to have been contaminated.

4. Total Suspended Particulates

All HVAS are run for 24 hours every six days in accordance with AM-15 of Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DECC, 2007), referencing AS/NZS 3580.9.3:2015 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) - High volume sampler gravimetric method, for the monitoring of TSP.

TSP results for the monitoring period are provided in **Table 4-1**.

Table 4-1 Total Suspended Particulate Monitoring Data – February 2018

Run Date	Criterion	A-PF2	M-WS4	A-PF5
	µg/m ³			
06/02/2018	-	78	54	53
12/02/2018	-	156	79	75
18/02/2018	-	106	82	83
24/02/2018	-	103	82	46
Monthly Mean	-	111	74	64
Annual Rolling Average	90	63.3	36.9	32.5

For the reporting period, the year to date average TSP data for HVAS A-PF2 and HVAS M-WS4 was below the annual average criterion of 90 µg/m³ at all monitoring sites.

5. Real Time PM₁₀ Monitoring

Continuous particulate matter less than 10µm (PM10) monitoring was conducted by three (3) Palas Fidas units at MPO during February 2018.

The EPA identification numbers 1 and 2 refer to Palas Fidas Units installed on Wybong Road (APF2) and Castlerock Road (APF5) respectively. In addition, a third unit (APF4) is installed on Kayuga Road with data used for management purposes only.

On the 5th and 15th of February 2018, monitoring location A-PF2 and A-PF4/A-PF5 exceeded 50 µg/m³ for the 24 hour rolling average. These exceedances were associated with wider regional air quality events and were not attributed to MACH Energy's operations.

Real time PM10 results for February 2018 are illustrated in **Figure 5-1** and shown in **Table 5- 1**

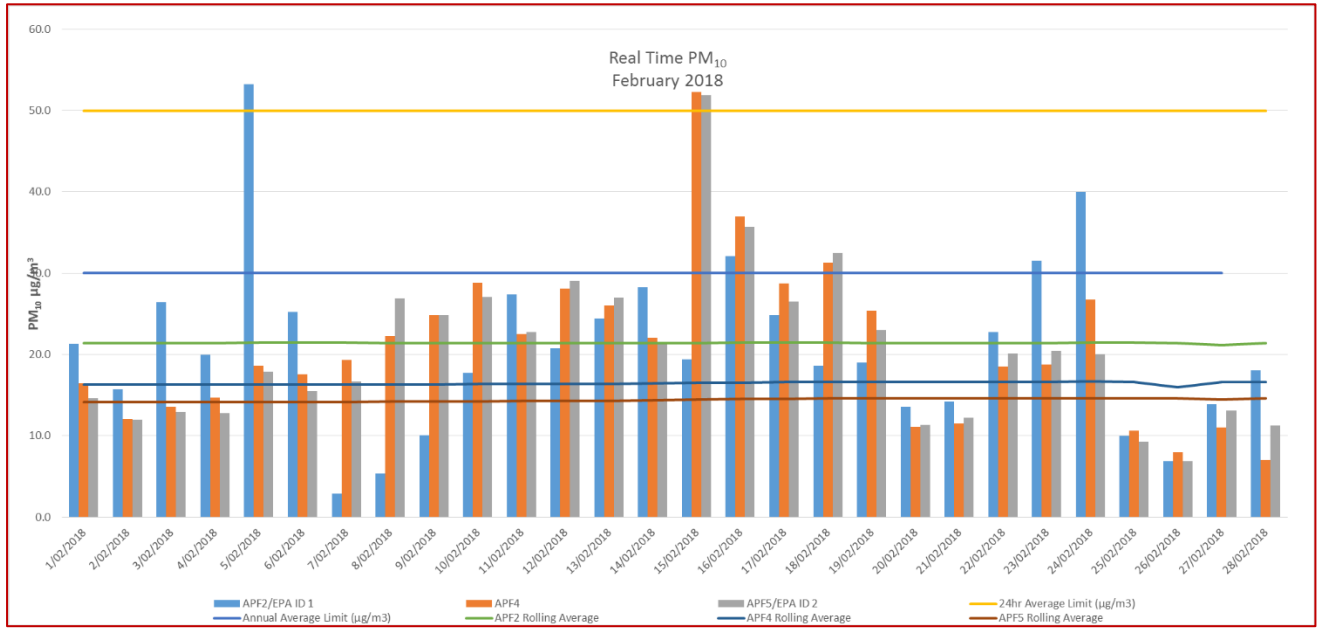


Figure 5-1 : MPO Daily Results from Palas Fidas – February 2018

Table 5-1: MPO Palas Fidas Data – February 2018

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m3)
	Daily Result	Daily Result	Daily Result	
1/02/2018	21.3	16.4	14.6	50
2/02/2018	15.7	12.1	12.0	50
3/02/2018	26.4	13.6	12.9	50
4/02/2018	19.9	14.7	12.8	50
5/02/2018	53.2	18.6	17.9	50
6/02/2018	25.2	17.6	15.5	50
7/02/2018	2.9	19.3	16.7	50
8/02/2018	5.4	22.3	26.9	50
9/02/2018	10.1	24.9	24.8	50
10/02/2018	17.7	28.8	27.0	50
11/02/2018	27.4	22.5	22.7	50
12/02/2018	20.8	28.1	29.1	50
13/02/2018	24.4	26.0	27.0	50
14/02/2018	28.3	22.0	21.5	50
15/02/2018	19.4	52.3	51.9	50
16/02/2018	32.1	37.0	35.7	50
17/02/2018	24.8	28.7	26.5	50
18/02/2018	18.6	31.3	32.5	50
19/02/2018	19.0	25.4	23.0	50
20/02/2018	13.6	11.1	11.4	50
21/02/2018	14.2	11.5	12.2	50
22/02/2018	22.8	18.5	20.1	50
23/02/2018	31.6	18.8	20.4	50
24/02/2018	40.0	26.7	20.0	50
25/02/2018	10.0	10.6	9.3	50
26/02/2018	6.9	8.0	6.8	50
27/02/2018	13.9	11.0	13.1	50
28/02/2018	18.0	7.0	11.3	50

6. Surface Water Monitoring

Monthly surface water quality sampling and field analysis was conducted on 22 February 2018 by AECOM. Laboratory analysis was performed by SRT NATA accredited laboratory. **Table 6-1** shows the total suspended solids, electrical conductivity and pH for the routine monthly monitoring.

Table 6-1 – MPO Surface Water Monitoring Results – February 2018

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)
W1	7.8	320	6
W2	x	x	x
W3	7.8	330	21
W4	7.3	1850	15
W5	*	*	*
W6A	7.9	320	9
W7	*	*	*
W8	x	x	x
W9	*	*	*
W11	x	x	x
W12	7.6	4750	4
W13	6.6	200	171
W14	*	*	*
W15	7.9	380	17
* dry or insufficient water x no suitable access point			

Four of the fourteen monitoring locations were found to be dry on the sampling day. W2, W8 and W11 were unable to be sampled due to unsafe access following a rain event. All of the sites sampled were below or inside the trigger level values during February 2018.

7. Groundwater Monitoring

Quarterly monitoring of groundwater is undertaken for depth to water (DTW), pH and electrical conductivity. Sampling was conducted in accordance with the Department of Planning and Environment document *Groundwater Monitoring Guidelines for Mine Sites within the Hunter Region*, as adapted from AS 5667.11 (1998) *Guidance on sampling of ground waters* and AS/NZS 5667.1 (1998) *Water Quality – Sampling – Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples*. Where monitoring bores could not be practically purged due to depth, large well volumes or slow recharge rates, water was extracted to achieve stability in field measurements before samples were extracted.

Table 7-1 – MPO Quarterly Groundwater Sampling Results

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)	Depth to Standpipe February 2018 (m)
WRA1L	7.1	4060	4.22
WRA1U*	Dry		
WRA2L	6.9	5520	18.08
WRA2U*	Dry		
WRA3L	6.5	15470	17.87
WRA3U	7.2	6230	6.02
WRA5L	6.6	5220	3.74
WRA5U	6.9	2630	4.24
WRA6L	6.8	5550	3.38
WRA6U	6.8	10930	4.13
MPBH1 (Bore3)	7	509	9.9
MPBH2	6.9	824	12.65
MPBH3 (Bore 2)	7.5	3310	12.39
3500C500 (L)	7.2	4390	56.02
3500C500 (S)	7	3710	25.35
4500F000	6.8	9240	23.6
5000D000	6.9	700	82.56
5500D000	6.9	3220	65.13
6000C000(L)^	No Access		
6000C000(S)^	No Access		
6500F500L	7.1	2720	52.78
6500F500M	7.2	2900	54.29
6500F500U	6.8	5470	30.94
7000D000U	6.6	6530	6
7000D000L	6.6	1393	18.64

7500F000	7.8	6290	35.67
Criteria	-	-	>20 %
<p>Dry/ insufficient water to sample</p> <p>^ Unable to sample due to access agreements</p>			

WRA1U and WRA2U were found to be dry at the time of sampling. 6000C000(L) and 6000C000(S) were unable to be sampled due to access issues with landholder. An exceedance of the adopted >20% change in depth criterion was noted at sites WRA5L and WRA5U. All other sites met the adopted criteria.

The next quarterly monitoring event is scheduled for May 2018 and the next annual monitoring event is scheduled for May 2018.

8. Noise Monitoring

In accordance with the MPO Noise Management Plan attended noise compliance monitoring is undertaken quarterly by a suitably qualified and experienced person. All monitoring measurements are undertaken during day, evening and night periods. Noise monitoring was undertaken during the day, evening and night periods. Monitoring was not undertaken in February 2018. The next quarterly monitoring event is scheduled for March 2018.

9. Blast Monitoring

Results for February 2018 are presented in **Table 9-1**.

Table 9-1 – MPO Blast Monitoring Results – February 2018

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BV02
02/02/2018	11:04	0.320 mm/s	100.6 DBL	0.090 mm/s	104.7 DBL	0.340 mm/s	98.8 DBL
07/02/2018	9:07	0.210 mm/s	97.2 DBL	0.080 mm/s	97.3 DBL	0.770 mm/s	105.5 DBL
07/02/2018	9:07	0.210 mm/s	97.2 DBL	0.080 mm/s	97.3 DBL	0.770 mm/s	105.5 DBL
09/02/2018	10:10	0.100 mm/s	85.9 DBL	0.060 mm/s	80.1 DBL	0.590 mm/s	105.5 DBL
15/02/2018	9:34	0.140 mm/s	94.2 DBL	0.080 mm/s	100.3 DBL	0.420 mm/s	95 DBL
16/02/2018	13:00	0.120 mm/s	92.7 DBL	0.050 mm/s	95.3 DBL	0.580 mm/s	100.6 DBL
23/02/2018	12:00	0.090 mm/s	96.8 DBL	0.070 mm/s	93.6 DBL	0.310 mm/s	113.2 DBL

Blast results complied with all criteria at each monitoring site.

10. Meteorological Monitoring

Weather data is measured continuously at the Kayuga Road (M-WS4). Temperature (2m) and rainfall data are presented below. In addition to these parameters the weather station also measures wind, temperature (10m), solar radiation, humidity, atmospheric pressure, and sigma theta. All data was captured during February 2018.