

Monthly Environmental Monitoring Report

November 2017

January 2018	1	Final	Klay Marchant	Shane Downer	Klay Marchant
Date	Rev.	Status	Prepared By	Checked By	Approved By

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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 November 2017
Reporting Period End Date	30 November 2017
Date Data Received	20 December 2017
Date Published	2 January 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**.

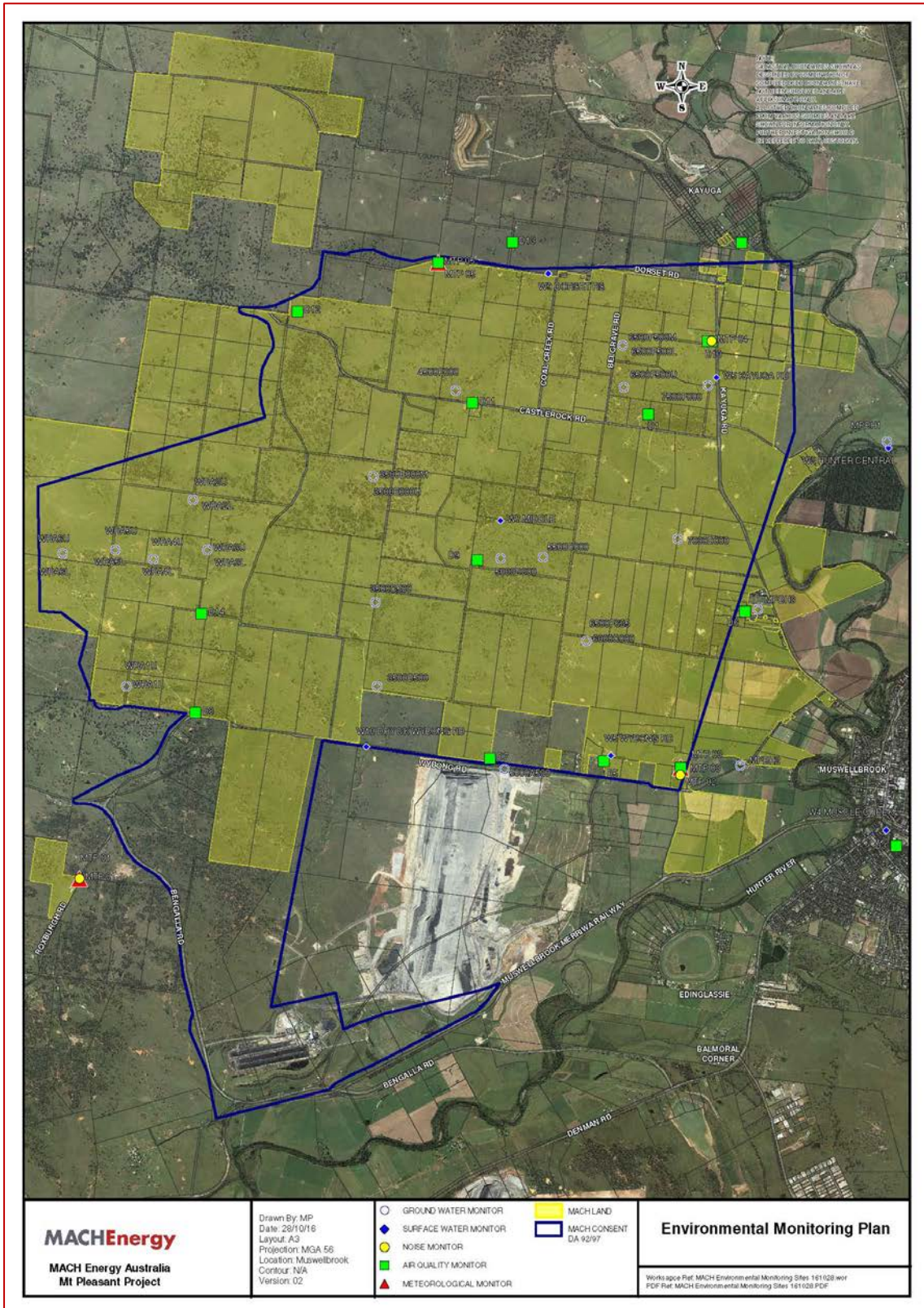


Figure 2-1 – MPO Environmental Monitoring Network

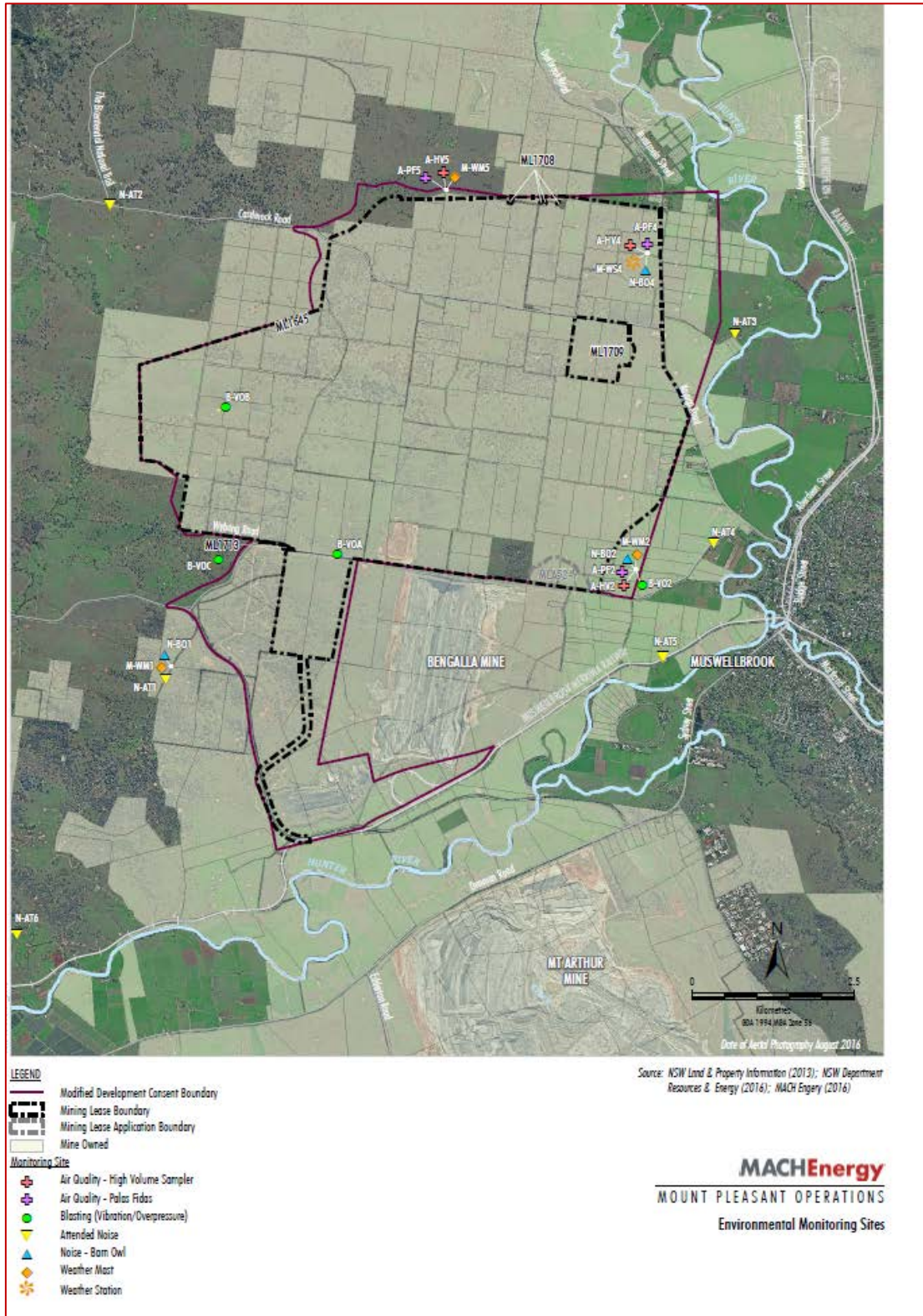


Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

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 23 October 2017. Sample collection was undertaken on 22 November 2017 by AECOM with sample analysis performed by SRT NATA accredited laboratory. The monitoring network comprises of 13 dust deposition gauges (DDG). Results for November are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results – November 2017

Station	Depositional Dust (g/m ² .month)		Ratio of Insoluble Solids to Ash (%)	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
	Insoluble Solids	Ash			
D1	1.0	0.6	60	1.3	1.4
D3	1.9	1.2	63	1.9	1.9
D4	0.6c	0.2c	33	1.5	1.6
D5	0.9	0.7	78	1.0	-*
D6	3.4c	2.2c	65	2.6	2.6
D7	7.6	5.7	75	6.2	-*
D8	6.2	5.0	81	6.0	5.7
D9	1.1	0.8	73	1.6	1.7
D10	0.7	0.5	71	1.3	1.4
D11	1.9	1.2	63	1.6	1.8
D12	0.7	0.5	71	0.8	0.8
D13	2.8	1.7	61	3.2	3.0
D14	3.1	2.2	71	2.5	2.8
<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.

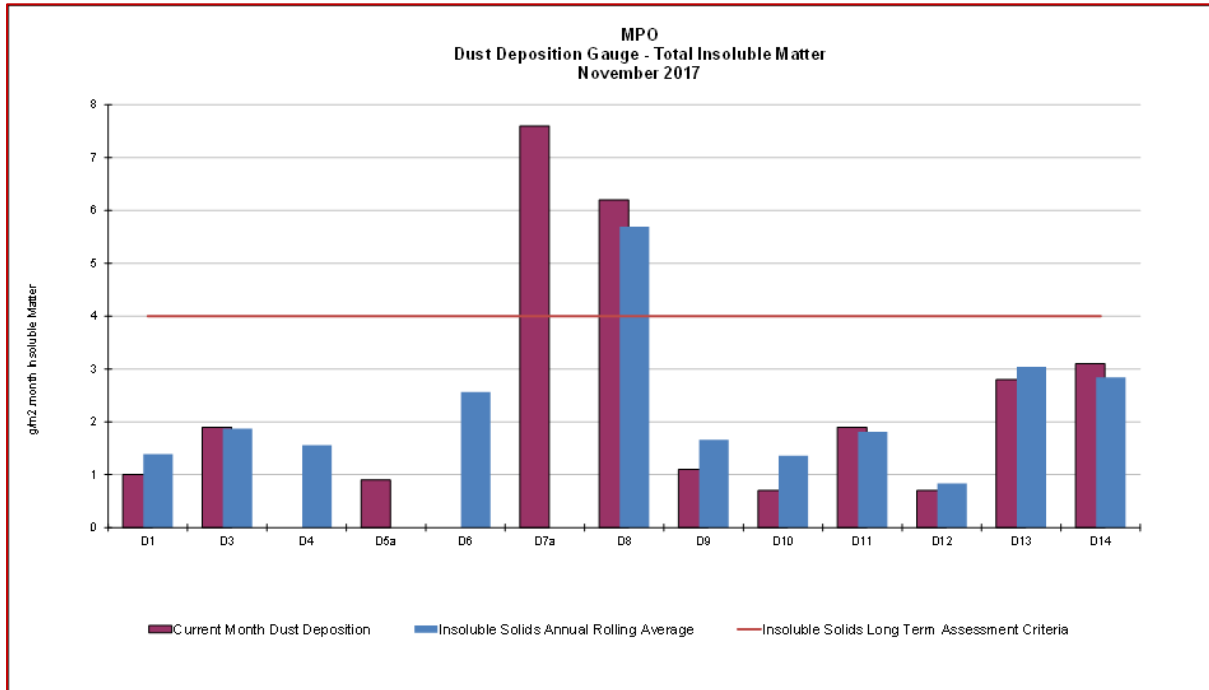


Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – November 2017

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at site D8 (5.7g/m².month). DDG water for both D4 and D6 was recorded in field notes as being cloudy and slightly turbid. These gauges both contained insects and D6 also contained bird droppings. The ash to insoluble solids ratio for D4 was less than 50%. This indicates that the contents of this DDG were mainly of organic material. As such, these samples were considered likely to have been contaminated. Due to the likelihood of contamination of gauges D4 and D6, the analysed results did not contribute to their respective annual rolling averages.

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 – November 2017

Run Date	Criterion	A-PF2	M-WS4	A-PF5
	µg/m ³			
2/11/2017	-	82	65	73
8/11/2017	-	41	20	22
14/11/2017	-	56	31	31
20/11/2017	-	37	27	33
26/11/2017	-	51	50	48
Monthly Mean	-	53.4	38.6	41.4
Annual Rolling Average	90	50.7*	29.8*	24.6*

*Year to date (YTD) average only available.

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 November 2017.

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.

Real time PM10 results for November 2017 are illustrated in **Figure 5-1** and shown in **Table 5- 1**

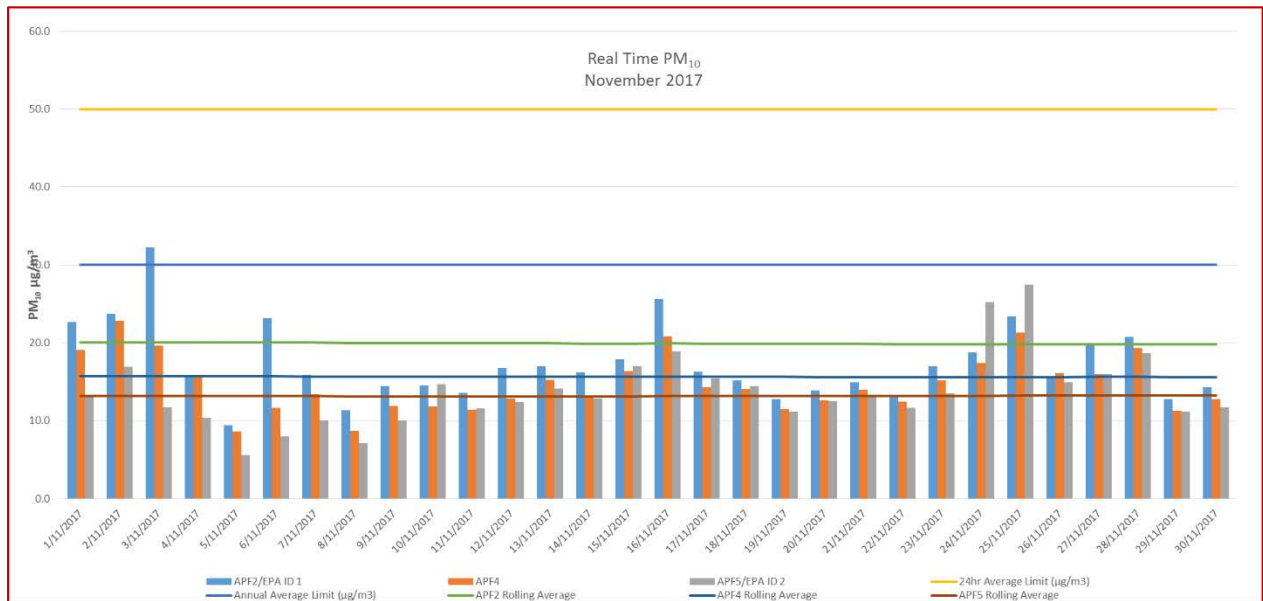


Figure 5-1 : MPO Daily Results from Palas Fidas – November 2017

Table 5-1: MPO Palas Fidas Data – November 2017

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m3)
	Daily Result	Daily Result	Daily Result	
1/11/2017	22.7	19.1	13.2	50
2/11/2017	23.7	22.9	16.9	50
3/11/2017	32.3	19.6	11.8	50
4/11/2017	15.6	15.8	10.4	50
5/11/2017	9.5	8.7	5.6	50
6/11/2017	23.1	11.7	8.0	50
7/11/2017	15.9	13.4	10.1	50
8/11/2017	11.3	8.7	7.2	50
9/11/2017	14.4	11.9	10.1	50
10/11/2017	14.5	11.8	14.7	50
11/11/2017	13.6	11.4	11.6	50
12/11/2017	16.8	12.8	12.4	50
13/11/2017	17.0	15.2	14.2	50
14/11/2017	16.2	13.0	12.8	50
15/11/2017	17.9	16.3	17.0	50
16/11/2017	25.6	20.9	18.9	50
17/11/2017	16.3	14.3	15.4	50
18/11/2017	15.2	14.1	14.5	50
19/11/2017	12.8	11.5	11.2	50
20/11/2017	13.9	12.6	12.5	50
21/11/2017	15.0	14.0	13.1	50
22/11/2017	13.1	12.5	11.6	50

23/11/2017	17.0	15.2	13.5	50
24/11/2017	18.8	17.4	25.2	50
25/11/2017	23.4	21.3	27.5	50
26/11/2017	15.5	16.1	15.0	50
27/11/2017	19.8	16.0	16.0	50
28/11/2017	20.7	19.4	18.7	50
29/11/2017	12.8	11.2	11.2	50
30/11/2017	14.3	12.8	11.8	50

6. Surface Water Monitoring

Monthly surface water quality sampling and field analysis was conducted on 22 November 2017 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 – November 2017

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)
W1	8.1	410	8
W2	8.0	370	6
W3	7.9	430	9
W4	7.7	1950	3
W5	*	*	*
W6A	8.0	410	6
W7	*	*	*
W8	*	*	*
W9	*	*	*
W11	7.9	5200	6
W12	7.7	4750	4
W13	*	*	*
W14	*	*	*
W15	7.9	460	16
* dry or insufficient water ^ no suitable access point			

Six of the fourteen monitoring locations were found to be dry on the sampling day. All of the sites sampled were below or inside the trigger level values during November 2017.

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.

Sampling was conducted in November 2017; results are provided in **Table 7-1**.

Table 7-1 – MPO Groundwater Monitoring Results – November 2017

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)	Depth to Standpipe November 2017 (m)	Depth to Standpipe August 2017 (m)
WRA1L	7.1	4130	3.72	3.18
WRA1U*	Dry			
WRA2L	7.0	5580	18.36	18.88
WRA2U*	Dry			
WRA3L	6.5	15390	17.55	17.39
WRA3U	7.1	6680	5.90	5.63
WRA5L	6.6	5020	2.86	1.69
WRA5U	7.0	2550	3.36	2.28
WRA6L	6.8	5400	2.92	2.37
WRA6U	6.6	11070	3.85	3.56
MPBH1 (Bore3)	7.0	485	10.04	10.10
MPBH2	6.8	829	12.69	12.49
MPBH3 (Bore 2)	7.6	3470	12.37	12.31
3500C500 (L)	7.2	4400	55.49	55.31
3500C500 (S)	7.1	3380	25.22	25.18
4500F000	6.8	9150	20.21	20.07
5000D000	7.0	692	82.74	82.71
5500D000	7.0	2850	65.21	65.25
6000C000(L)	7.0	5300	20.90	20.96
6000C000(S)	7.1	5090	39.48	39.50
6500F500L	7.0	2600	52.69	52.76
6500F500M	7.2	2930	54.13	54.22
6500F500U	6.6	5570	30.36	29.87
7000D000U	6.6	6510	5.87	5.81
7000D000L	6.7	1356	18.84	18.84
7500F000	7.9	6250	33.59	35.91
<i>Criteria</i>	-	-	>20 %	-

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)	Depth to Standpipe November 2017 (m)	Depth to Standpipe August 2017 (m)
Results in bold indicate exceedences of adopted assessment criteria				
* Dry/ insufficient water to sample				
^ Unable to sample due to blockage.				

WRA1U and WRA2U were found to be dry at the time of sampling. An exceedance of the adopted >20% change in depth criterion was noted at sites WRA5L, WRA5U and WRA6L. All other sites met the adopted criteria. No mining has occurred in this location and is likely attributable to dry conditions.

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 between 31 October and 2 November 2017, at six monitoring locations in accordance with the MPO Environmental Protection Licence (EPL). Noise levels from MPO complied with all criteria at each monitoring location during all monitoring periods.

Results are presented in full in the October 2017 Monthly Environmental Monitoring Report.

9. Blast Monitoring

Blasting has not yet commenced at MPO.

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 November 2017.