MACHEnergy

Monthly Environmental Monitoring Report

March 2018

March 2018	1	Final
Date	**Rev.**	**Status**

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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 March 2018
Reporting Period End Date	31 March 2018
Date Data Received	2 May 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 PM_{10} 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**.

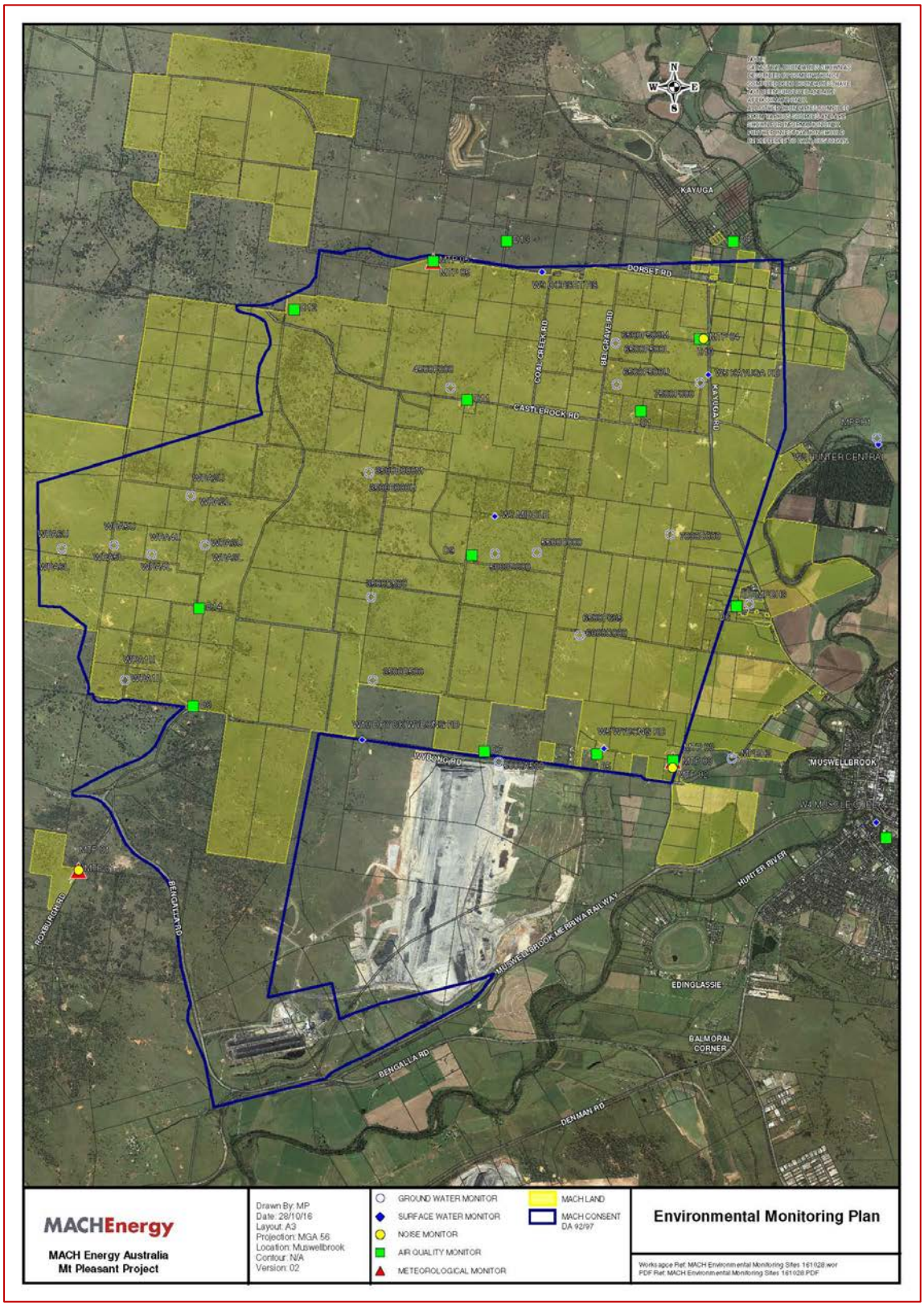

Figure 2-1 – MPO Environmental Monitoring Network

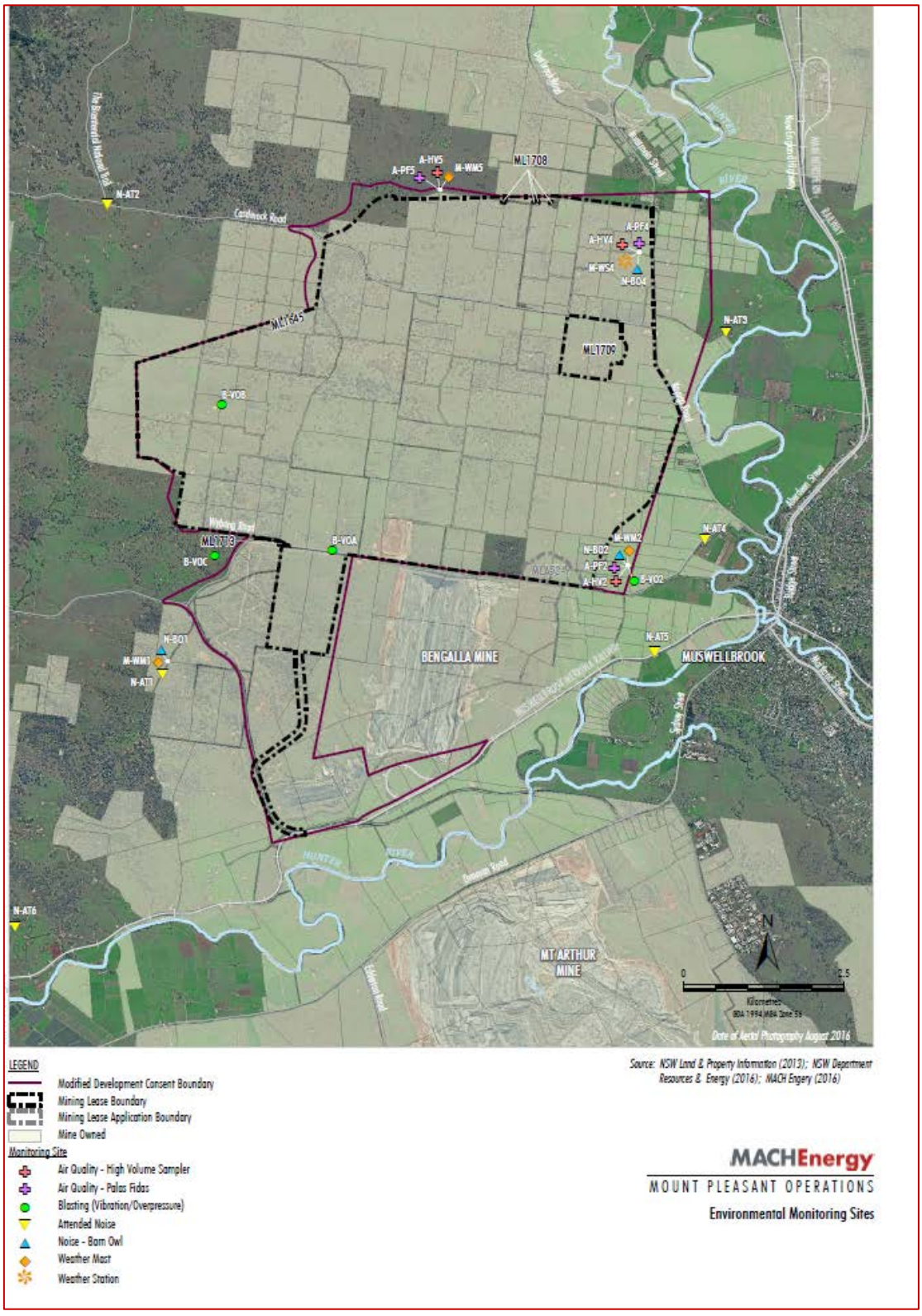

Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

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 February 2018. Sample collection was undertaken on 21 March 2018 by AECOM with sample analysis performed by SRT NATA accredited laboratory. The monitoring network comprises of 13 dust deposition gauges (DDG). Results for March 2018 are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results – March 2018

Location	YTD Insoluble Solids (g/m2.month)	Insoluble Solids Annual Rolling Average (g/m2.month)
D1	1.5	1.2
D3	3.5	2.1
D4	1.7	1.2
D5	2.6	1.4*
D6	4.5	3.2
D7	9.8	5.7*
D8	4.2	4.3
D9	1.5	1.6
D10	1.4	1.2
D11	1.5	1.7
D12	0.9	0.8
D13	1.9	2.6
D14	3.3	2.5
Criterion	-	*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.

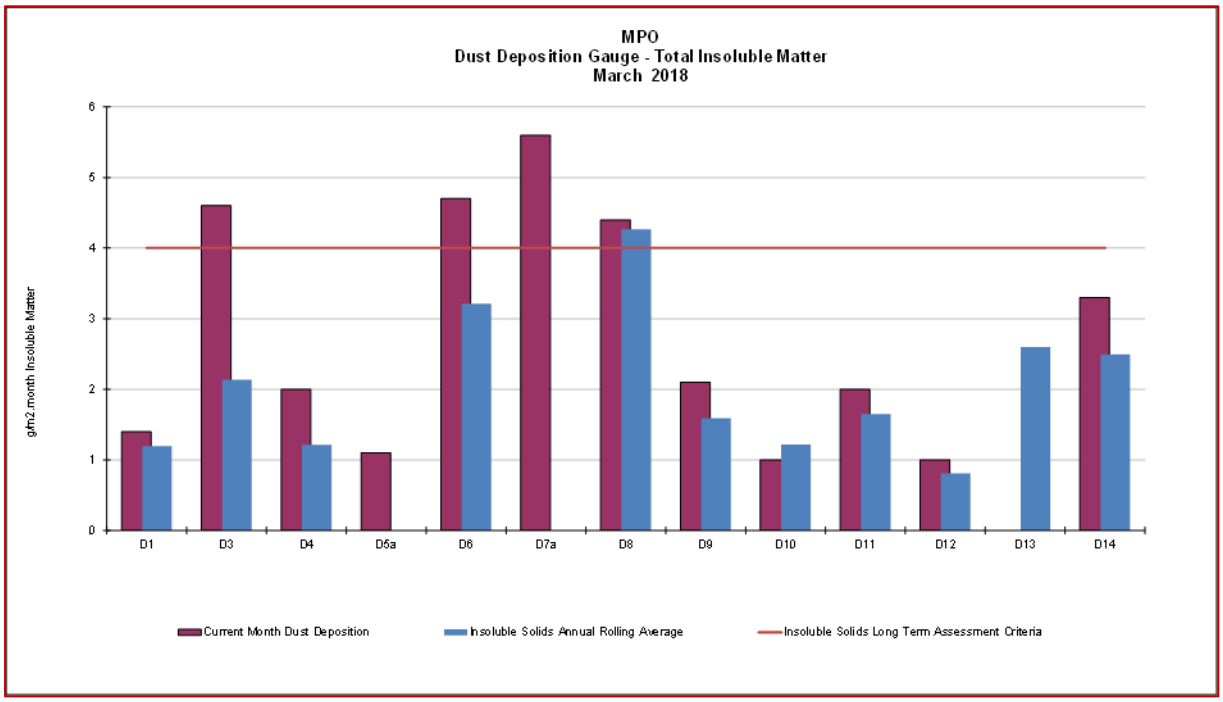

Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – March 2018

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at site D8 (4.3 g/m^2.month). DDG water for D13 was recorded in field notes as being light brown and slightly turbid. The gauge contained insects and had a low ash to insoluble solids ratio (52%). The monthly dust deposition result of 4.6 g/m^2/month exceeded the annual average result at this site (2.6 g/m^2/month) and as such the sample was considered likely to have been contaminated.
Due to the likelihood of contamination the D13 gauge analysed result did not contribute to the annual rolling average.

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 – March 2018

Run Date	Criterion	A-PF2	M-WS4	A-PF5
	µg/m^3			
2/03/2018	-	50	38	39
8/03/2018	-	35	21	25
14/03/2018	-	84	49	51
20/03/2018	-	163	140	132
26/03/2018		96	24	20
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 PM_{10} Monitoring

Continuous particulate matter less than 10µm (PM10) monitoring was conducted by three (3) Palas Fidas units at MPO during March 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 19th and 20th of March 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 March 2018 are illustrated in **Figure 5-1** and shown in **Table 5- 1**

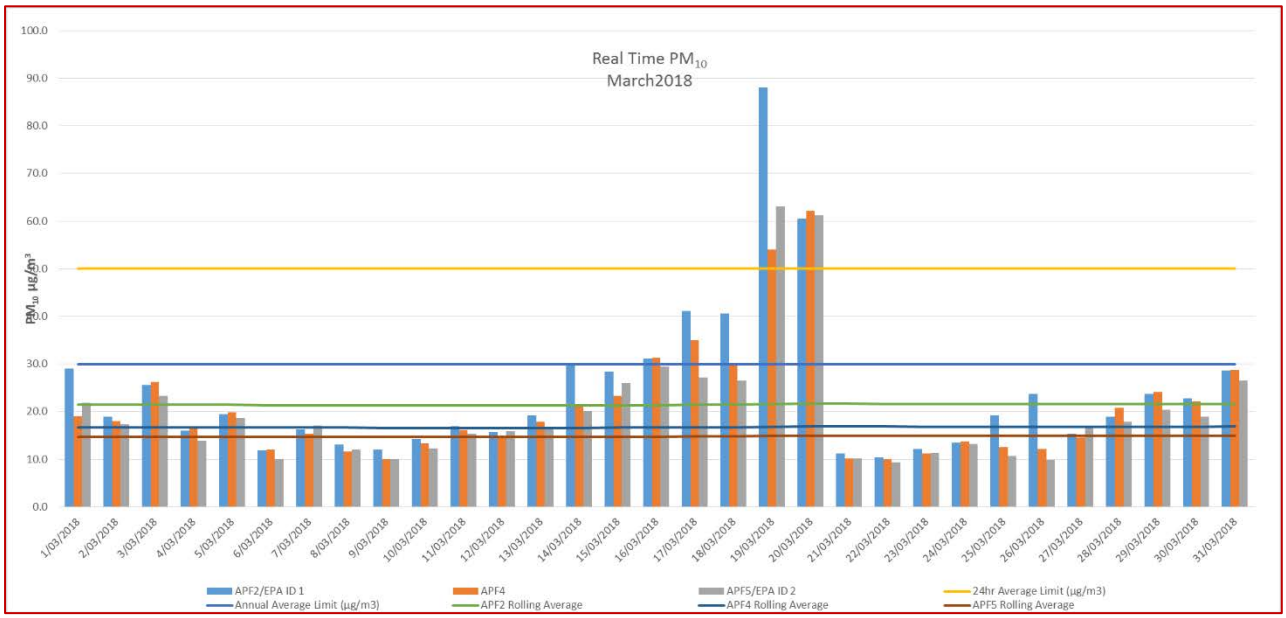

Figure 5-1 : MPO Daily Results from Palas Fidas – March 2018

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

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m^3)
	Daily Result			
1/03/2018	29.1	19.0	21.9	50.0
2/03/2018	18.9	18.0	17.2	50.0
3/03/2018	25.5	26.2	23.2	50.0
4/03/2018	16.0	16.3	13.9	50.0
5/03/2018	19.4	19.8	18.7	50.0
6/03/2018	11.8	12.0	10.0	50.0
7/03/2018	16.2	15.3	17.0	50.0
8/03/2018	13.1	11.7	12.0	50.0
9/03/2018	12.0	10.0	10.1	50.0
10/03/2018	14.3	13.3	12.3	50.0
11/03/2018	16.9	16.1	15.3	50.0
12/03/2018	15.7	14.8	15.8	50.0
13/03/2018	19.1	17.9	16.6	50.0
14/03/2018	30.2	21.3	20.1	50.0
15/03/2018	28.3	23.3	26.0	50.0
16/03/2018	31.2	31.2	29.5	50.0
17/03/2018	41.1	35.0	27.2	50.0
18/03/2018	40.6	29.8	26.5	50.0
19/03/2018	88.1	54.0	63.1	50.0
20/03/2018	60.6	62.2	61.2	50.0
21/03/2018	11.2	10.2	10.1	50.0
22/03/2018	10.4	10.0	9.4	50.0
23/03/2018	12.2	11.2	11.3	50.0
24/03/2018	13.5	13.7	13.2	50.0
25/03/2018	19.2	12.5	10.7	50.0
26/03/2018	23.6	12.2	9.9	50.0
27/03/2018	15.3	14.6	16.8	50.0
28/03/2018	18.9	20.8	17.9	50.0
29/03/2018	23.7	24.1	20.4	50.0
30/03/2018	22.8	22.1	18.9	50.0
31/03/2018	28.6	28.7	26.5	50.0

6. Surface Water Monitoring

Monthly surface water quality sampling and field analysis was conducted on 27 March 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 – March 2018

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)
W1	8.0	340	16
W2	8.0	340	19
W3	7.9	360	21
W4	7.4	1400	10
W5	*	*	*
W6A	8.0	340	10
W7	*	*	*
W8	x	x	x
W9	*	*	*
W11	x	x	x
W12	8.0	4850	5
W13	*	*	*
W14	*	*	*
W15	7.7	450	22
** dry or insufficient water* *x no suitable access point*			

Five of the fourteen monitoring locations were found to be dry on the sampling day. W11 was unable to be sampled due to access requirements. Site W8 has been destroyed. Site W2 exceeded the trigger level for TSS. All of the remaining sites sampled were below or inside the trigger level values during March 2018.

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7. Groundwater Monitoring

Quarterly monitoring of groundwater is undertaken for depth to water (DTW), pH and electrical Monitoring did not occur during March 2018. The next sampling event is scheduled for May 2018, which will include quarterly and annual monitoring.

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 undertaken in March 2018. Results will be made available during the April 2018 monthly report.

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9. Blast Monitoring

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

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

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BV02
1/03/2018	14:01	0.130 mm/s	100.8 DBL	0.050 mm/s	101 DBL	0.260 mm/s	96.3 DBL
2/03/2018	10:04	0.640 mm/s	111.4 DBL	0.160 mm/s	109.9 DBL	0.630 mm/s	105.7 DBL
9/03/2018	13:01	0.300 mm/s	96.9 DBL	0.140 mm/s	99.3 DBL	1.020 mm/s	105.8 DBL
12/03/2018	14:09	0.820 mm/s	95.1 DBL	0.150 mm/s	90.2 DBL	0.570 mm/s	98.4 DBL
14/03/2018	12:00	0.240 mm/s	93.6 DBL	0.150 mm/s	95.7 DBL	0.980 mm/s	101.9 DBL
16/03/2018	10:59	0.470 mm/s	106.2 DBL	0.150 mm/s	102.9 DBL	1.040 mm/s	113.1 DBL
19/03/2018	14:00	0.440 mm/s	101.9 DBL	0.080 mm/s	86.6 DBL	0.480 mm/s	96.8 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 March 2018.