

Monthly Environmental Monitoring Report

May 2017

May 2017	1	Final	Klay Marchant	Beth Viertel	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.

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; 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**.

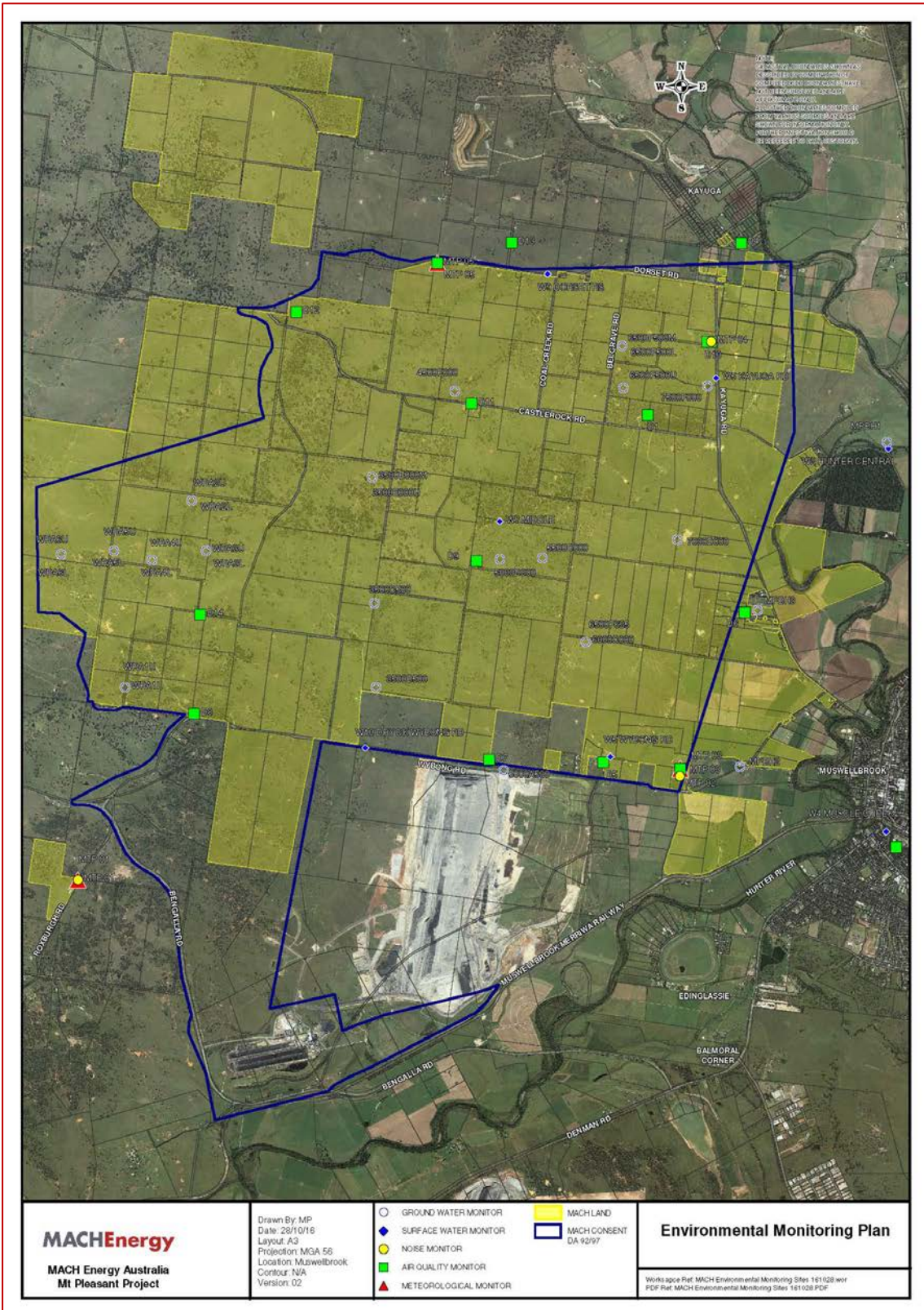


Figure 2-1 – MPO Environmental Monitoring Network

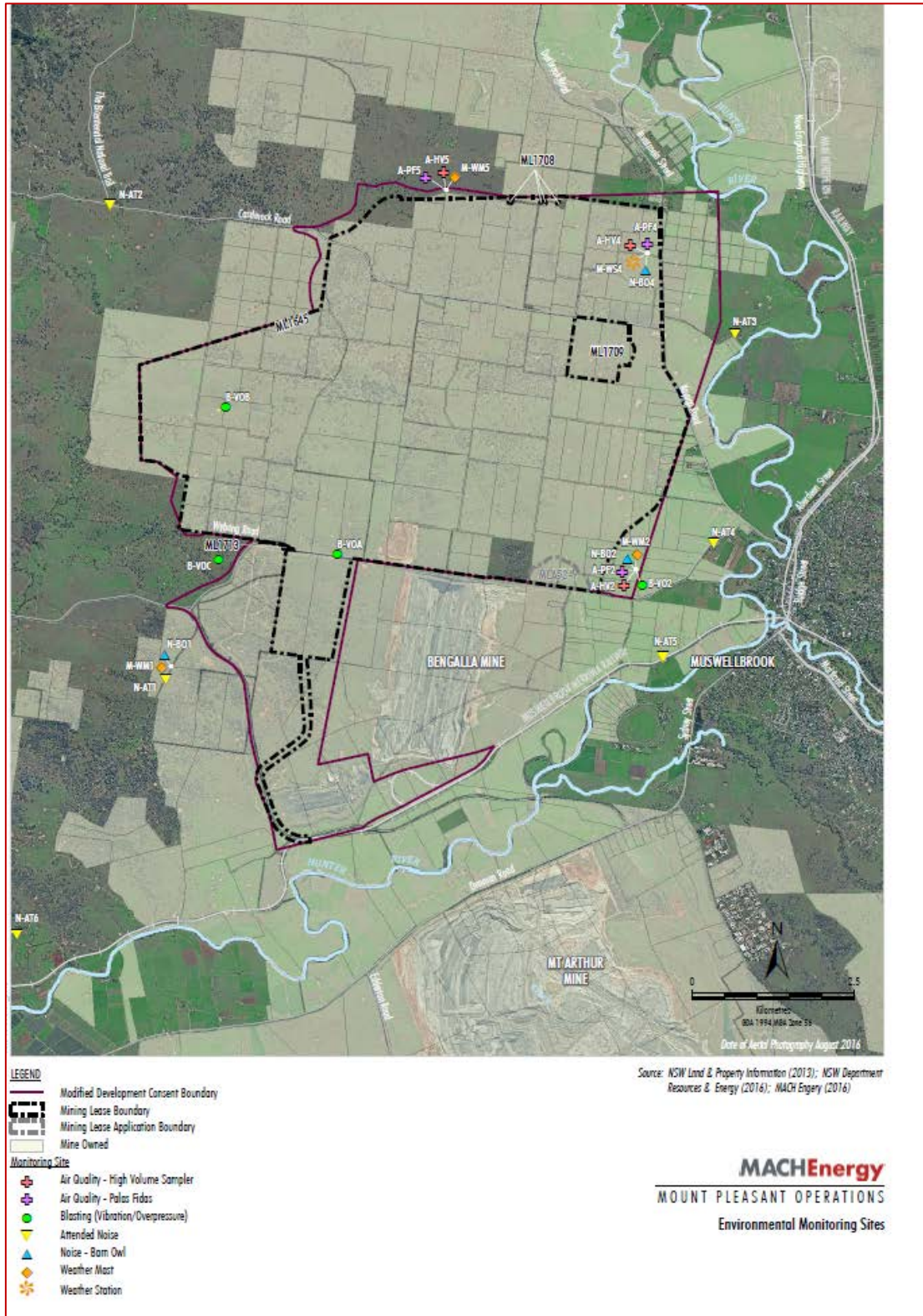


Figure 2-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

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 monitoring network comprises of 13 dust deposition gauges (DDG). Results for April May are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results –May 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	1.1	0.7	64	1.7	1.4
D3	1.6	1.1	69	2.1	1.7
D4	0.7	0.3	43	1.8	1.4
D5	3.0	1.7	57	2.7	2.4
D6	2.6	1.5	58	3.0	2.2
D7	13.2c	6.9c	52	4.0	4.4
D8	5.4	4.0	74	7.7	5.0
D9	1.3	0.8	62	1.9	1.5
D10	1.1	0.6	55	1.7	1.3
D11	1.2	0.7	58	1.4	1.2
D12	0.2	0.1	50	0.9	0.7
D13	5.2c	1.3c	25	4.5	2.9
D14	2.1	1.5	71	3.2	2.9
<i>Criterion</i>	-	-	-	-	4

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.

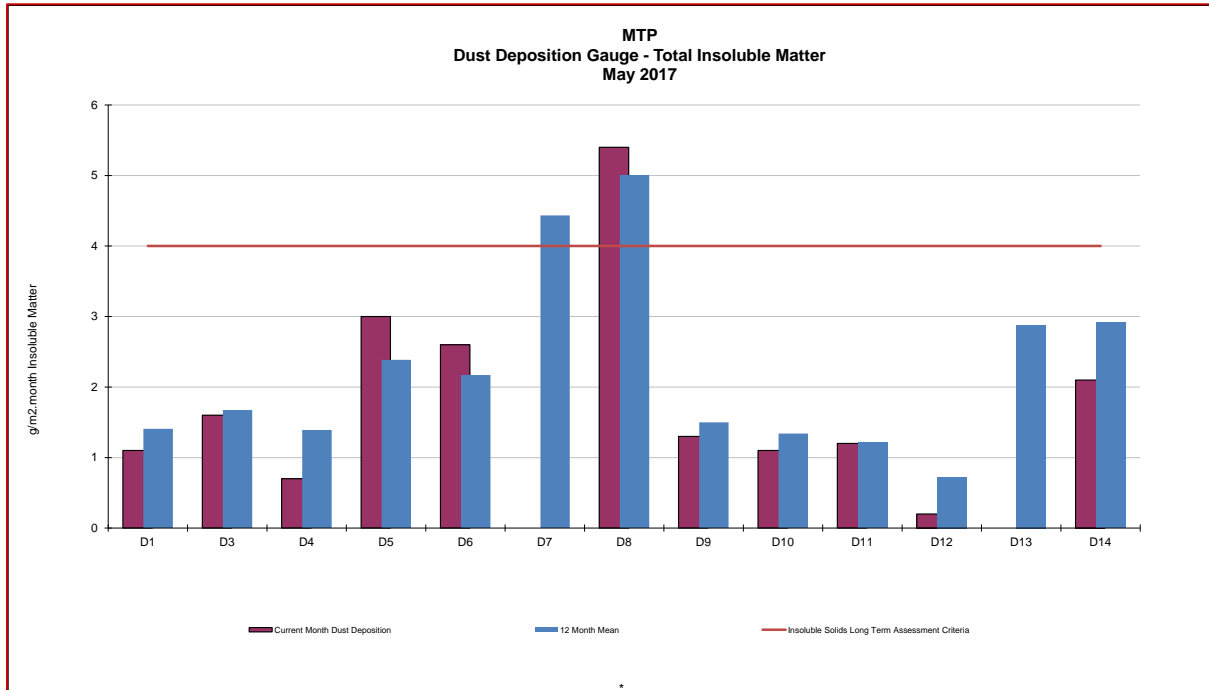


Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – May 2017

Exceedance of the EPA annual average criterion for dust deposition (insoluble solids) was recorded at sites D7 (4.4g/m².month) and D8 (5.0g/m².month). Field notes for the D8 sample state that it was clear and contained insects and vegetation. The ash to insoluble solids ratio for the gauge was 74% which indicates that the contents were mainly inorganic material.

The D7 and D13 gauge were contaminated in May and therefore did not contribute to the annual rolling average. Field notes from the May sampling event noted that all the gauges contained insects. Bird droppings were also present in two of the gauges along with vegetation in one of these gauges

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 – May 2017

Run Date	Criterion	A-PF2	M-WS4	A-PF5
	µg/m ³			
6/05/2017	-	40	24	11
12/05/2017	-	62	55	42
18/05/2017	-	51	42	37
24/05/2017	-	73	16	11
30/05/2017	-	20	11	8
Monthly Mean	-	49.2	29.6	21.8
Annual Rolling Average	90	*41.2	*28.1	*23.8

*Year to date (YTD) average only available.

For the reporting period, the year to date average TSP data 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 MTP during May 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.

No results were above the daily or annual limit (**Table 5-1**). Real time PM₁₀ results for May 2017 are illustrated in **Figure 5-1** and shown in **Table 5- 2**.

Table 5-1 Explanation of TEOM results above criteria

Site	Date	Result (µg/m ³)	Weather	Comments
There were no average results above the daily limit				
There were no average results above the annual limit				

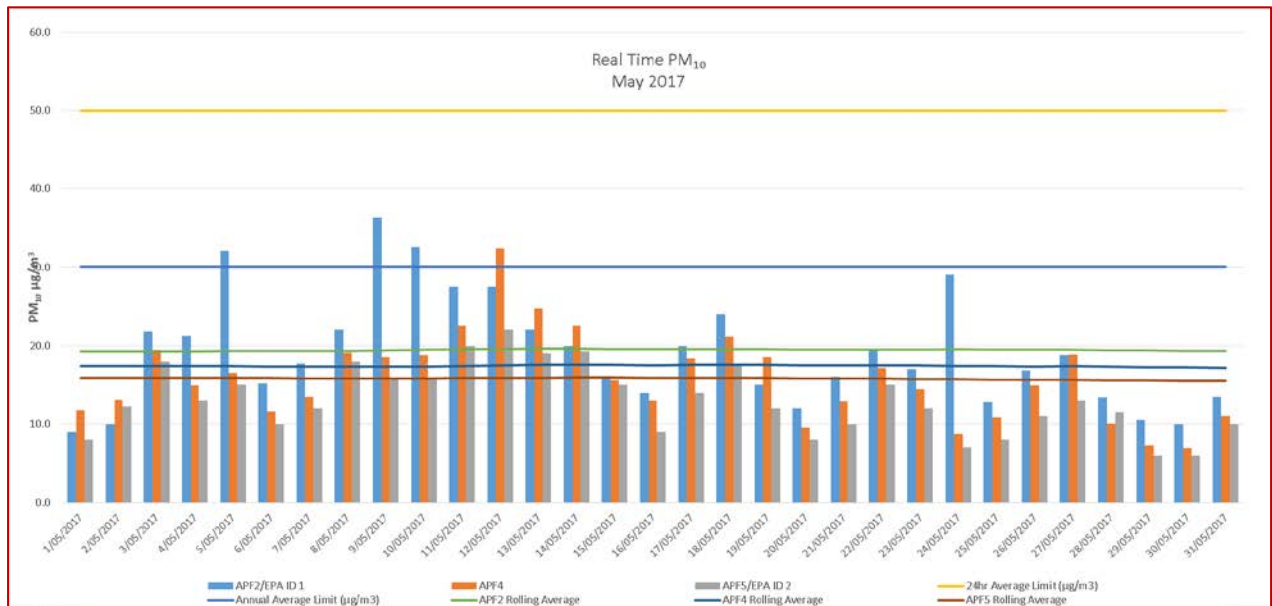


Figure 5-1 : MPO Daily Results from Palas Fidas

Table 5-2: MPO Palas Fidas Data – May 2017

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m ³)
	Daily Result	Daily Result	Daily Result	
1/05/2017	9.0	11.7	8.0	50
2/05/2017	10.0	13.1	12.3	50
3/05/2017	21.8	19.5	18.0	50
4/05/2017	21.3	14.9	13.0	50
5/05/2017	32.1	16.5	15.0	50
6/05/2017	15.2	11.6	10.0	50
7/05/2017	17.7	13.5	12.0	50
8/05/2017	22.1	19.1	18.0	50
9/05/2017	36.3	18.5	16.0	50
10/05/2017	32.6	18.8	16.0	50
11/05/2017	27.6	22.5	20.0	50
12/05/2017	27.6	32.4	22.0	50
13/05/2017	22.0	24.8	19.0	50
14/05/2017	20.0	22.5	19.3	50
15/05/2017	16.0	15.6	15.0	50
16/05/2017	14.0	13.0	9.0	50
17/05/2017	20.0	18.4	14.0	50
18/05/2017	24.0	21.2	17.4	50
19/05/2017	15.0	18.6	12.0	50
20/05/2017	12.0	9.6	8.0	50
21/05/2017	16.0	12.9	10.0	50
22/05/2017	19.5	17.2	15.0	50

23/05/2017	17.0	14.5	12.0	50
24/05/2017	29.1	8.8	7.0	50
25/05/2017	12.9	10.9	8.0	50
26/05/2017	16.9	14.9	11.0	50
27/05/2017	18.8	18.9	13.0	50
28/05/2017	13.4	10.0	11.5	50
29/05/2017	10.6	7.2	6.0	50
30/05/2017	10.0	7.0	6.0	50
31/05/2017	13.5	11.0	10.0	

6. Surface Water Monitoring

Surface water quality is monitored on a monthly basis at nine (9) sites. **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 – May 2017

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)
W1 - Hunter Upstream	^	^	^
W2 - Hunter Central Site	8.2	350	2
W4 - Muscle Creek	7.6	1750	5
W5 – Kayuga Road	*	*	*
W6 - Hunter Downstream	^	^	^
W7 – Middle MTP near DDG9	*	*	*
W8 – Wybong Rd near DDG5	6.7	230	1170
W9 – Dorset Rd – 2 nd culvert	*	*	*
W10 – Dry Creek Wybong Rd	*	*	*
<i>Criteria</i>	6.5 – 8.5	125 - 2200	<50
* dry or insufficient water ^ no suitable access point			

Four of the nine monitoring locations were found to be dry or had insufficient water on the sampling day. W1 and W6 were not sampled as no suitable access point was identified. W8 did not meet the criteria for TSS. No construction activities are located near W8. All of the other sites sampled met the adopted criteria during May 2017.

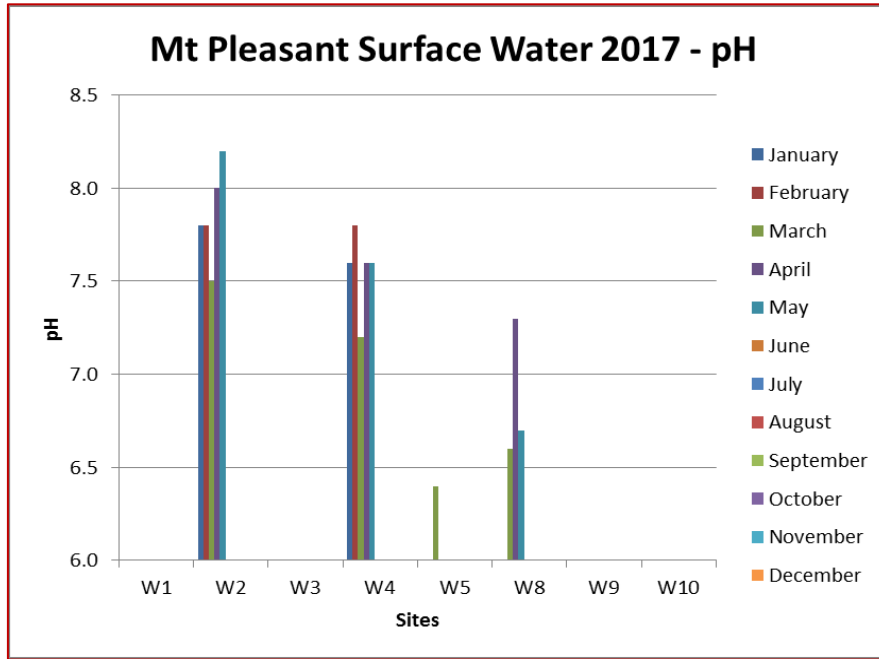


Figure 6-1 – MPO Surface Water pH

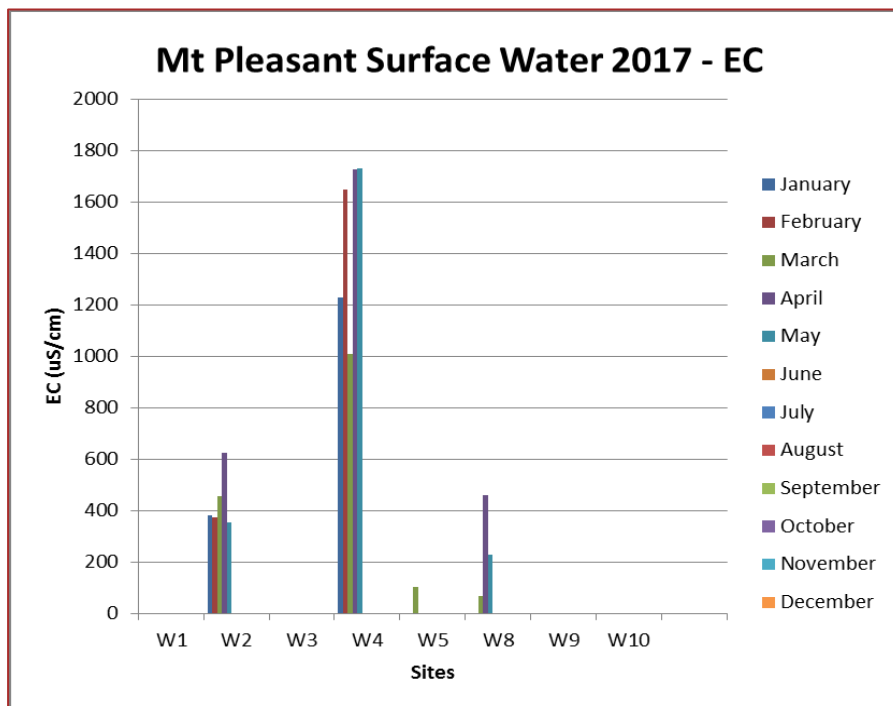


Figure 6-2 – MPO Surface Water EC

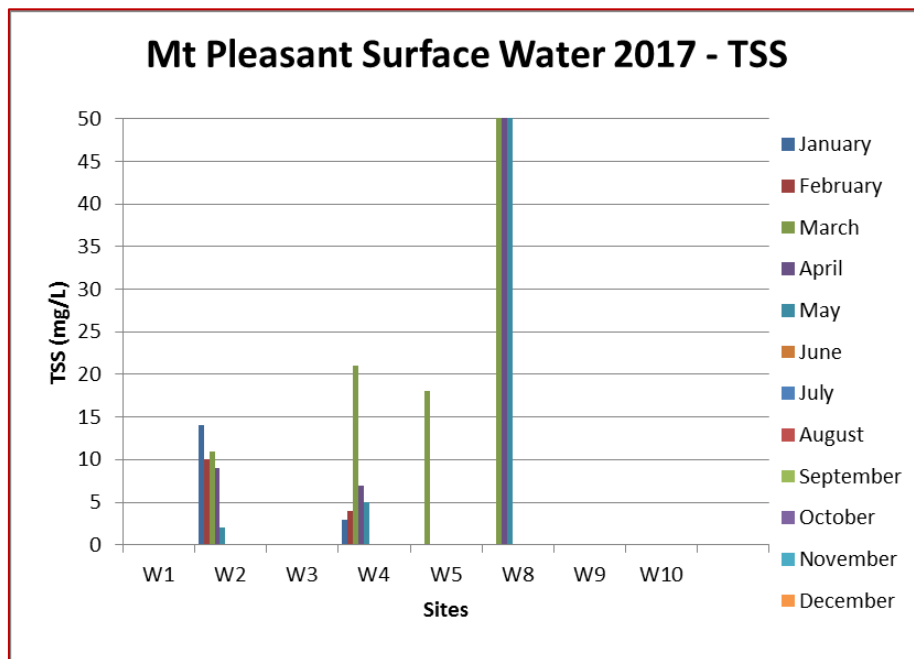


Figure 6-3 – MPO Surface Water TSS

7. Groundwater Monitoring

Quarterly sampling of groundwater is undertaken for pH and electrical conductivity. Sampling was conducted during May 2017; results are provided in **Table 7-1**.

Monitoring Location/ ID	pH	Electrical Conductivity ($\mu\text{s}/\text{cm}$)	Depth to Standpipe May 2017 (m)	Depth to Standpipe February 2017 (m)
WRA1L	7.2	3460	3.33	3.36
WRA1U*			Dry	
WRA2L	7.4	5600	17.40	17.59
WRA2U*			Dry	
WRA3L	6.9	16350	17.41	17.67
WRA3U			Sampling in June 2017	
WRA5L	7.2	3840	1.69	2.98
WRA5U	7.3	2680	2.28	3.49
WRA6L	7.1	6070	2.51	2.94
WRA6U			Sampling in June 2017	
MPBH1 (Bore3)	6.7	491	9.75	10.00
MPBH2	6.8	835	12.47	12.50
MPBH3 (Bore 2)	7.7	3190	12.27	12.30
3500B500 (L)	7.4	5680	68.56	68.37
3500B500 (S)^			Unable to sample - Blocked	
3500C500 (L)	7.3	4480	54.90	54.70

Monitoring Location/ ID	pH	Electrical Conductivity (µs/cm)	Depth to Standpipe May 2017 (m)	Depth to Standpipe February 2017 (m)
3500C500 (S)	7.4	2270	25.31	25.34
4500F000	6.9	9100	22.49	21.05
5000D000	6.9	701	82.69	82.59
5500D000	7.0	2220	62.59	65.04
6000C000(L)	6.9	5350	20.97	-
6000C000(S)	6.9	5030	39.36	39.42
6500F500L	6.9	1630	52.79	53.01
6500F500M	7.4	2960	54.23	54.66
6500F500U	7.0	5570	29.95	31.10
7000D000U	6.6	6620	5.75	5.82
7000D000L	6.8	1349	18.88	19.00
7500F000	7.9	6300	36.14	36.17
<i>Criteria</i>	-	-	>20 %	-
* Dry/ insufficient water to sample ^ Unable to sample due to blockage.				

8. Noise Monitoring

In accordance with the MPO Construction Noise Management Plan attended noise compliance monitoring is undertaken monthly and quarterly by a suitably qualified and experienced person. Quarterly monitoring was conducted on 22 May 2017 with results obtained on 5 July 2017. All monitoring measurements were undertaken during day, evening and night periods. Construction was limited to day time hours only.

Full attended noise monitoring results for May 2017 are shown in **Table 8-1**.

Table 8-1 – Attended Noise Monitoring Results – May 2017

Table 4.3: LAeq,15minute GENERATED BY MTP AGAINST CONSTRUCTION NOISE CRITERIA – MAY 2017

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MTP LAeq dB ^{2,4}	Exceedance dB ^{3,4}
N-AT1	22/05/2017 13:45	3.4	0	40	Yes	IA	Nil
N-AT1	22/05/2017 14:00	3.4	0	40	Yes	IA	Nil
N-AT2	22/05/2017 12:49	2.6	0	40	Yes	IA	Nil
N-AT2	22/05/2017 13:04	2.4	0	40	Yes	IA	Nil
N-AT3	22/05/2017 12:04	2.8	0	40	Yes	IA	Nil
N-AT3	22/05/2017 12:19	2.5	0	40	Yes	IA	Nil
N-AT4	22/05/2017 11:24	3.2	0	42	Yes	IA	Nil
N-AT4	22/05/2017 11:39	3.2	0	42	Yes	IA	Nil
N-AT5	22/05/2017 10:44	1.1	0	44	Yes	IA	Nil
N-AT5	22/05/2017 10:59	1.3	0	44	Yes	IA	Nil
N-AT6	22/05/2017 14:30	2.3	0	40	Yes	IA	Nil
N-AT6	22/05/2017 14:45	3.8	0	40	Yes	IA	Nil

Notes:

- Noise emission limits do not apply during periods of rainfall or winds greater than 5 metres per second (at a height of 10 metres);
- Estimated or measured LAeq,15minute attributed to MTP;
- NA in exceedance column means atmospheric conditions outside those specified in project approval and so criterion is not applicable; and
- Bolded results in red indicate exceedance of criteria.

Construction noise levels from MPO complied with LAeq, 15 minute criteria at all monitoring locations during May 2017 monitoring.

9. 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 May 2017.