Mount Pleasant Operation

Monthly Environmental Monitoring Report

December 2016

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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 Tapered Element Oscillating Microbalance (TEOM) PM_{10} 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 1 and Figure 2**.

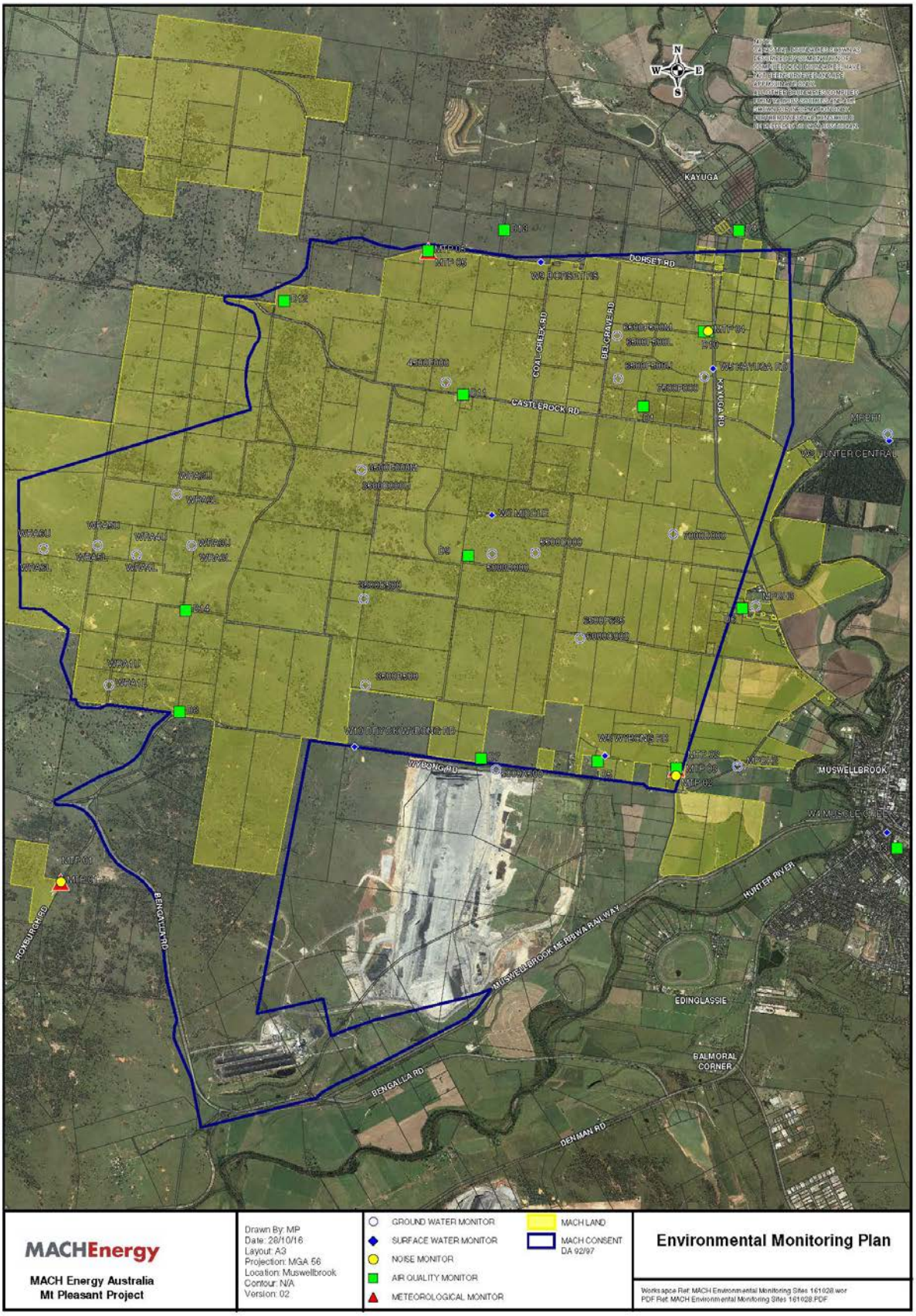

Figure 1 – MPO Environmental Monitoring Network

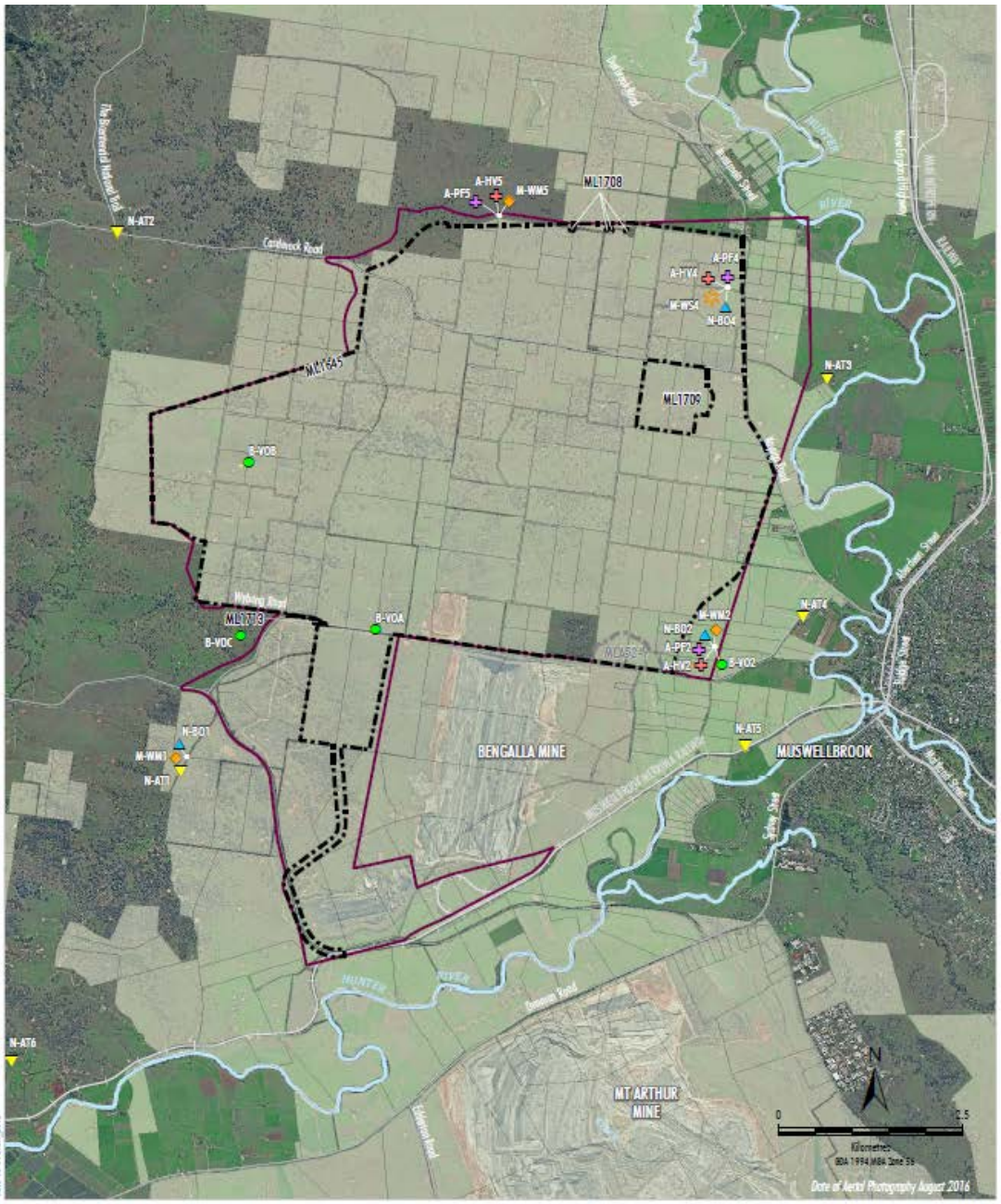

Figure 2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

3. DUST DEPOSITIONAL GAUGES

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 December 2016 are shown in **Table 1**.

Table 1 - Dust Deposition Results – December 2016

Station	Depositional Dust (g/m².month)		Ratio of Insoluble Solids to Ash (%)	YTD Insoluble Solids (g/m².month)	Insoluble Solids Annual Rolling Average (g/m².month)
	Insoluble Solids	Ash			
D1	2.8	1.2	43	1.3	1.3
D3	2.0	1.3	65	1.5	1.5
D4	2.5	1.3	52	1.5	1.5
D5	6.3c	2.2c	35	2.2	2.2
D6	2.2	1.2	55	2.3	2.3
D7	4.7c	2.4c	51	6.8	**6.8**
D8	2.9	2.1	72	3.7	3.7
D9	1.9	1.3	68	1.6	1.6
D10	2.2	1.1	50	1.1	1.1
D11	3.3	1.6	48	1.3	1.3
D12	0.7	0.3	43	0.7	0.7
D13	2.1	1.1	52	2.0	2.0
D14	6.3	3.6	57	3.2	3.2
Criterion	-	-	-	-	*4*

Results in **bold** indicate exceedances' of adopted assessment criteria
'c.' indicates contaminated gauge. Results not included in annual average calculation.

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** compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.

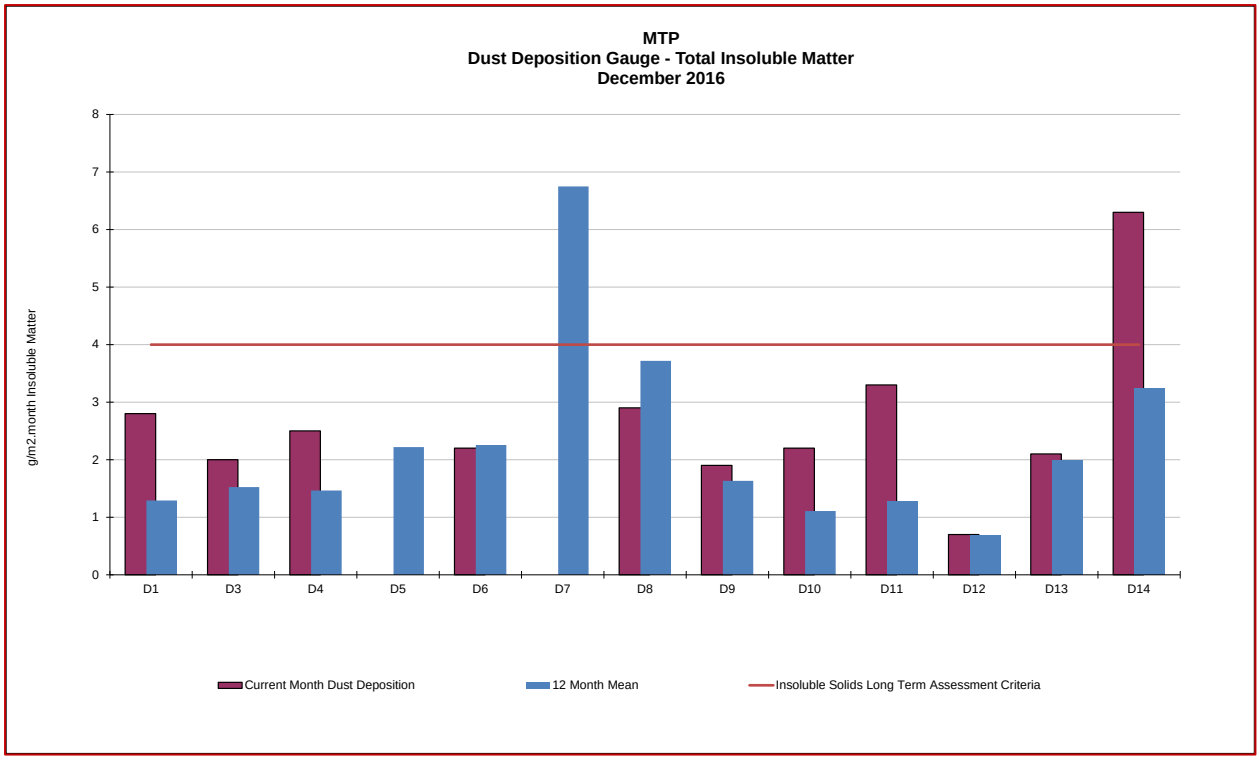

Figure 3: MPO DDG Total Insoluble Solids Monitoring Results – December 2016

Exceedance of the OEH annual average criterion for dust deposition (insoluble solids) was recorded at site D7 (6.8g/m^2. month). The gauge was contaminated in December and therefore did not contribute to the annual rolling average.

4. REAL TIME PM_{10} MONITORING

Continuous particulate matter less than 10µm (PM10) monitoring was conducted by three Tapered element oscillating microbalance (TEOM) units at MTP during December 2016.

The EPA identification numbers 1 and 2 refer to TEOMs 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 purposed only.

No results were above the daily or annual limit (**Table 2**). Real time PM10 results for December 2016 are illustrated in **Figure 4**.

Table 2 - Explanation of TEOM results above criteria

Site	Date	Result (µg/m3)	Weather	Comments
There were no average results above the daily limit				
There were no average results above the annual limit				

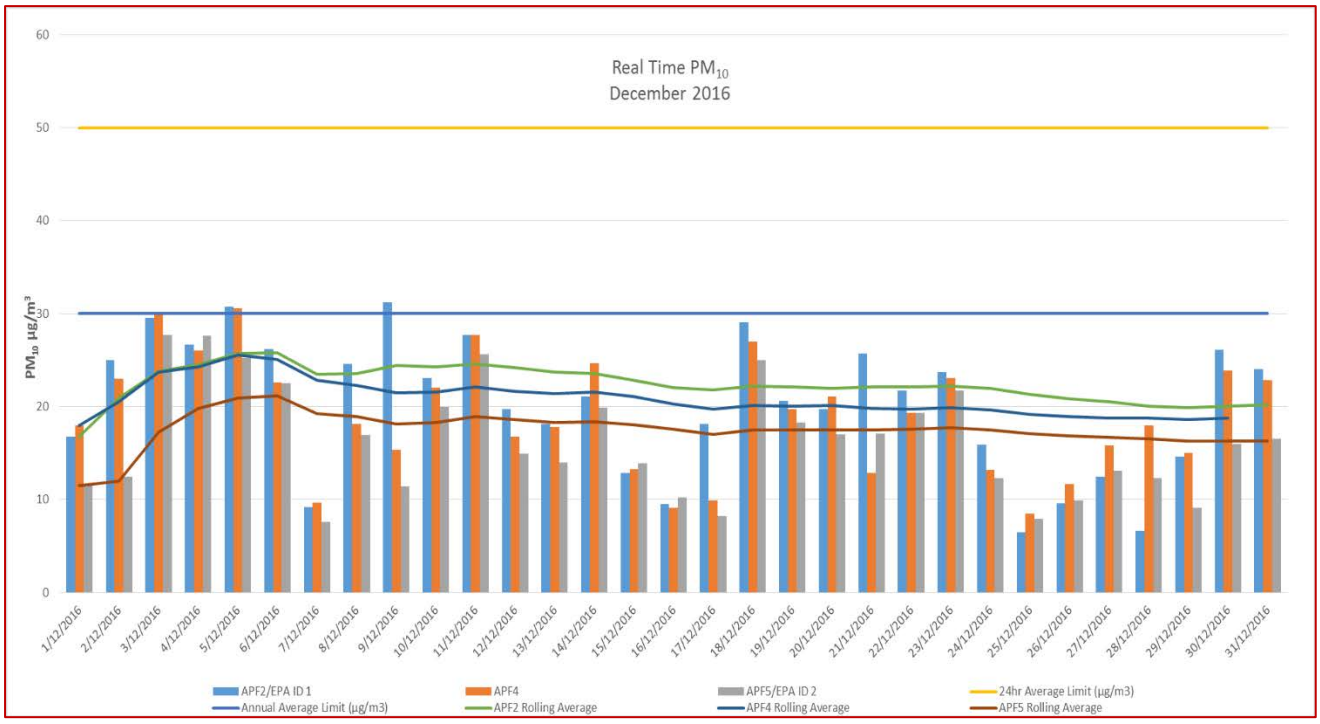

Figure 4: MPO Daily Results from TEOM

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Table 3: TEOM Data – December 2016

Date	APF2/EPA ID 1	APF4	APF5/EPA ID 2	24hr Average Limit (µg/m3)
	Daily Result	Daily Result	Daily Result	
1/12/2016	16.8	18	11.5	50
2/12/2016	25	23	12.5	50
3/12/2016	29.5	30.1	27.7	50
4/12/2016	26.7	26	27.6	50
5/12/2016	30.7	30.6	25.2	50
6/12/2016	26.2	22.6	22.5	50
7/12/2016	9.2	9.7	7.6	50
8/12/2016	24.6	18.1	16.9	50
9/12/2016	31.2	15.3	11.4	50
10/12/2016	23.1	22	20	50
11/12/2016	27.7	27.7	25.6	50
12/12/2016	19.7	16.8	14.9	50
13/12/2016	18.1	17.8	14	50
14/12/2016	21.1	24.7	19.9	50
15/12/2016	12.9	13.3	13.9	50
16/12/2016	9.5	9.1	10.2	50
17/12/2016	18.1	9.9	8.2	50
18/12/2016	29.1	27	25	50
19/12/2016	20.6	19.7	18.3	50
20/12/2016	19.7	21.1	17	50
21/12/2016	25.7	12.9	17.1	50
22/12/2016	21.7	19.3	19.3	50
23/12/2016	23.7	23.1	21.7	50
24/12/2016	15.9	13.2	12.3	50
25/12/2016	6.5	8.5	7.9	50
26/12/2016	9.6	11.7	9.9	50
27/12/2016	12.5	15.8	13.1	50
28/12/2016	6.6	18	12.3	50
29/12/2016	14.6	15	9.1	50
30/12/2016	26.1	23.9	16	50
31/12/2016	24	22.8	16.5	50

5. SURFACE WATER

Surface water quality is monitored on a monthly basis at nine sites**. Table 4** shows the total suspended solids, electrical conductivity and pH for the routine monthly monitoring.

Table 4 – Monthly Surface Water Monitoring Results – December 2016

Sampling Point	Monitoring Frequency	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)
W1 - Hunter Upstream	Monthly	^	^	^
W2 - Hunter Central Site	Monthly	8.2	550	16
W4 - Muscle Creek	Monthly	7.6	1500	10
W5 – Kayuga Road	Monthly	*	*	*
W6 - Hunter Downstream	Monthly	^	^	^
W7 – Middle MTP near DDG9	Monthly	*	*	*
W8 – Wybong Rd near DDG5	Monthly	*	*	*****
W9 – Dorset Rd – 2nd culvert	Monthly	*	*	*
W10 – Dry Creek Wybong Rd	Monthly	*	*	*
Criteria		*6.5 – 8.5*	*125 - 2200*	*<50*
Results in **bold** indicate exceedances of adopted assessment criteria ** dry or insufficient water* *^ no suitable access point*				

Five 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. All sites sampled met the adopted criteria during December 2016.

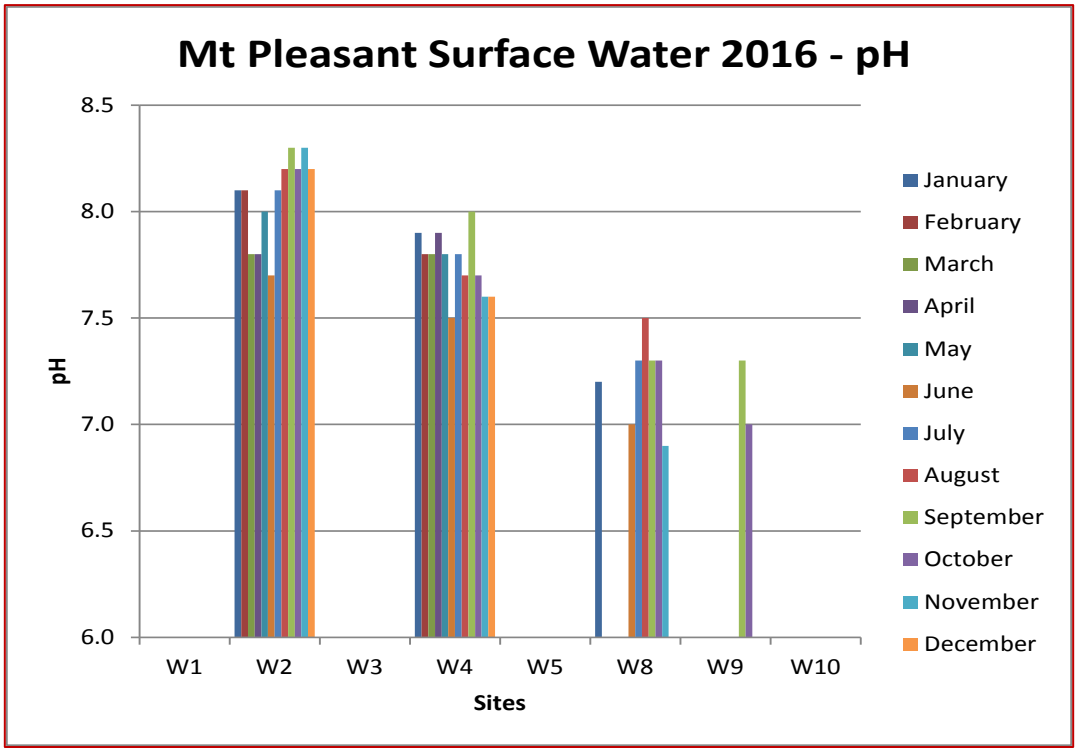

Figure 5: MPO Surface Water pH

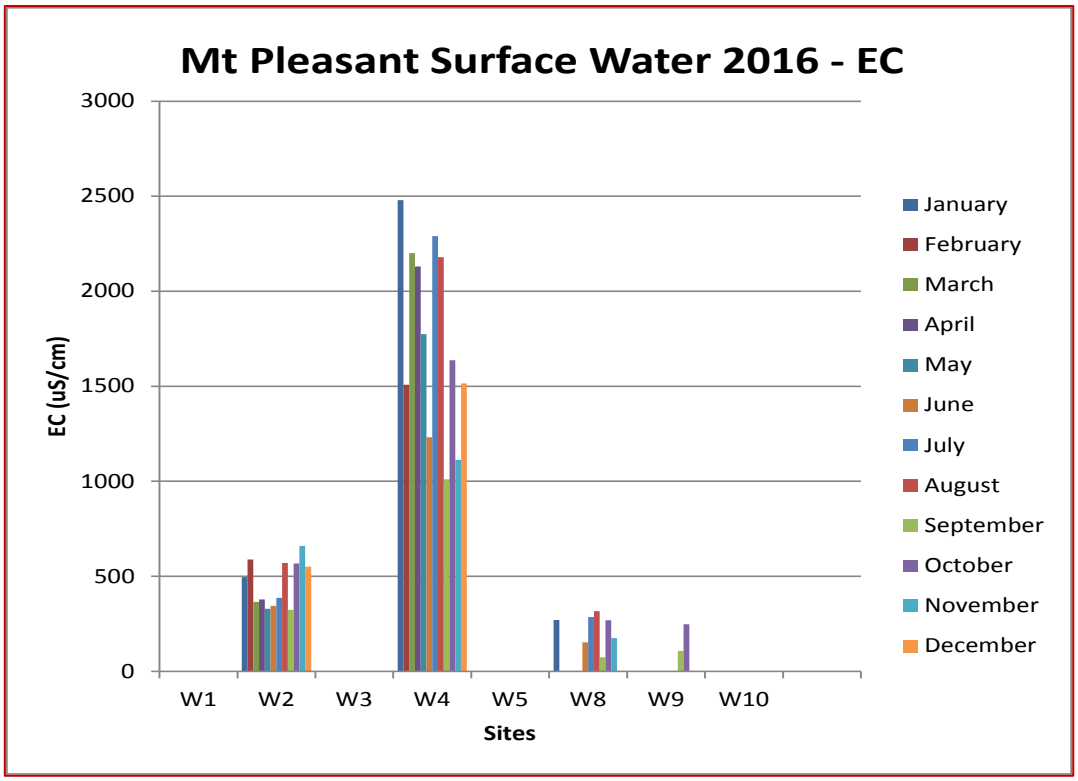

Figure 6: MPO Surface Water EC

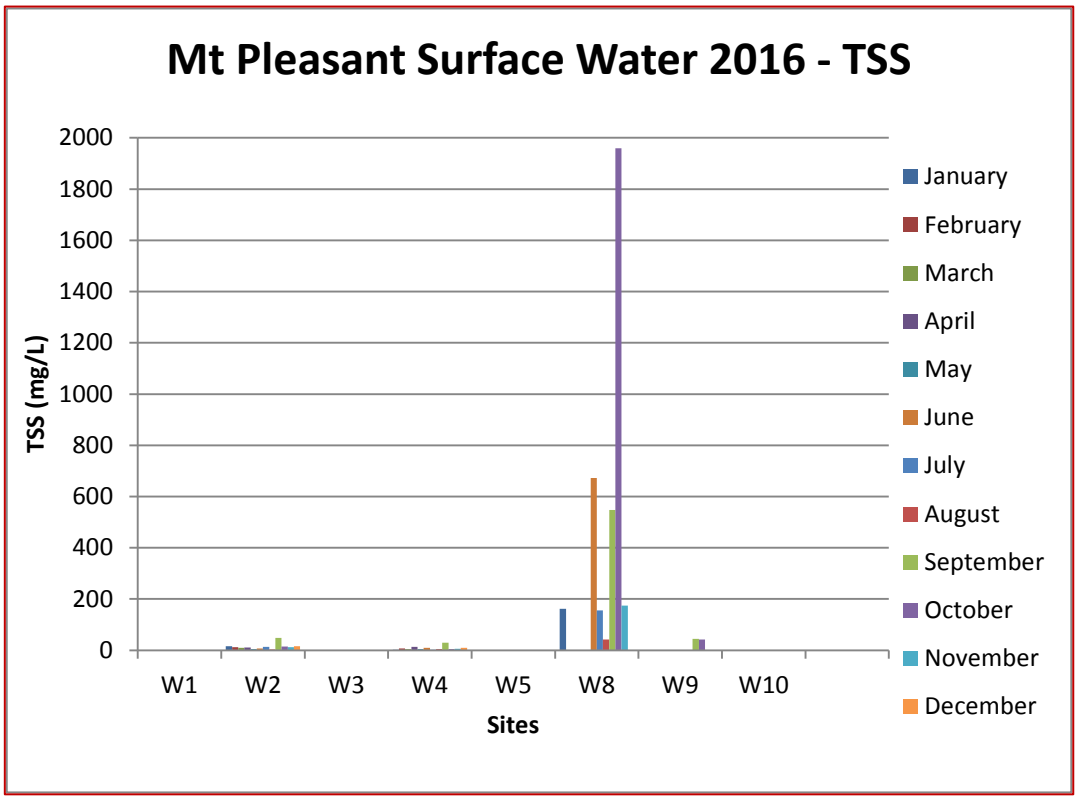

Figure 7 MPO Surface Water TSS

6. GROUNDWATER

Groundwater sampling did not occur during December 2016. The next sampling event is scheduled for February 2017.

7. NOISE

In accordance with the MPO Construction Noise Management Plan attended noise compliance monitoring is undertaken monthly by a suitably qualified and experienced person. Monthly monitoring was conducted in December 2016 with results obtained on 19 January 2017. All monitoring measurements were undertaken during day time construction hours.

Full attended noise monitoring results for December 2016 are shown in **Table 5.**

Table 5 – Attended Noise Monitoring Results – December 2016

Table 4.3: $L_{Aeq,15minute}$ GENERATED BY MTP AGAINST CONSTRUCTION NOISE CRITERIA – DECEMBER 2016

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies [1]	MTP L_{Aeq} dB [2,4]	Exceedance dB [3,4]
N-AT1	19/12/2016 14:23	3.7	0	40	Yes	IA	Nil
N-AT1	19/12/2016 14:38	5.6	0	40	No	IA	NA
N-AT2	19/12/2016 12:47	4.3	0	40	Yes	IA	Nil
N-AT2	19/12/2016 13:02	3.8	0	40	Yes	IA	Nil
N-AT3	19/12/2016 11:35	3.1	0	40	Yes	IA	Nil
N-AT3	19/12/2016 11:50	2.7	0	40	Yes	IA	Nil
N-AT4	19/12/2016 10:47	2.7	0	42	Yes	IA	Nil
N-AT4	19/12/2016 11:02	3.0	0	42	Yes	IA	Nil
N-AT5	19/12/2016 10:07	2.2	0	44	Yes	IA	Nil
N-AT5	19/12/2016 10:22	2.7	0	44	Yes	IA	Nil
N-AT6	19/12/2016 13:43	3.5	0	40	Yes	IA	Nil
N-AT6	19/12/2016 13:58	4.2	0	45	Yes	IA	Nil

Notes:

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

Construction noise levels from MPO complied with L_{Aeq}, 15 minute criteria at all monitoring locations during December 2016 monitoring.

8. METEOROLOGY

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 December 2016.