

# Mount Pleasant Operation Monthly Environmental Monitoring Report

April 2020



#### 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 operations, respectively.

The purpose of this report is to provide a monthly update of monitoring data in accordance with the requirements of NSW Environmental Protection Licence (EPL) 20850, Section 66(6) of the *Protection of the Environment Operations Act 1997* (POEO Act) and the MPO Development Approval (DA 92/97).

**Table 1-1 – Mount Pleasant Operation** 

Name of Operation	Mount Pleasant Operation
Name of Licensee	MACH Energy Australia Pty Ltd
Environmental Protection Licence	20850
Project Approval	DA 92/97
Reporting Period Start Date	1 April 2020
Reporting Period End Date	30 April 2020
Date All Data Received	19 May 2020

To view MPO EPL 20850 or DA 92/97 in full please refer to the link below:

https://machenergyaustralia.com.au/mount-pleasant/documentation/

### 2. Monitoring Requirements

The MPO EPL 20850 specifically requires the monitoring of:

- 2 x Palas Fidas Air Quality Monitoring 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).

All monitoring is undertaken by suitably qualified and experienced person(s).

The MPO Environmental Monitoring Network is shown in the following figures. **Figure 2-1** shows MPO attended noise monitoring assessment groups and monitoring locations. **Figure 2-2** shows the MPO air quality monitoring network. **Figure 2-3** shows the MPO Blast Monitoring Locations. **Figure 2-4** shows the MPO groundwater monitoring network. **Figure 2-5** shows the MPO surface water monitoring network.

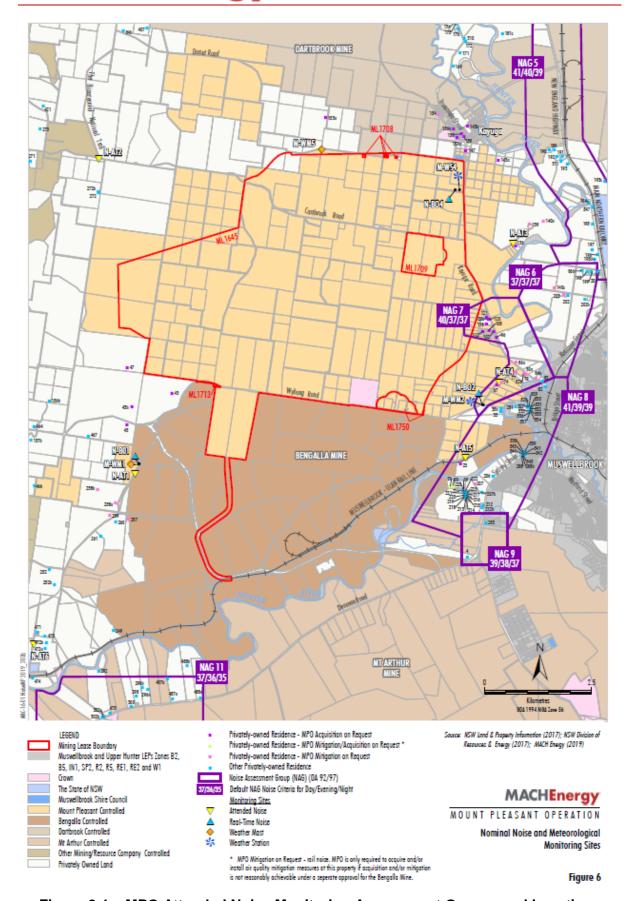


Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups and Locations

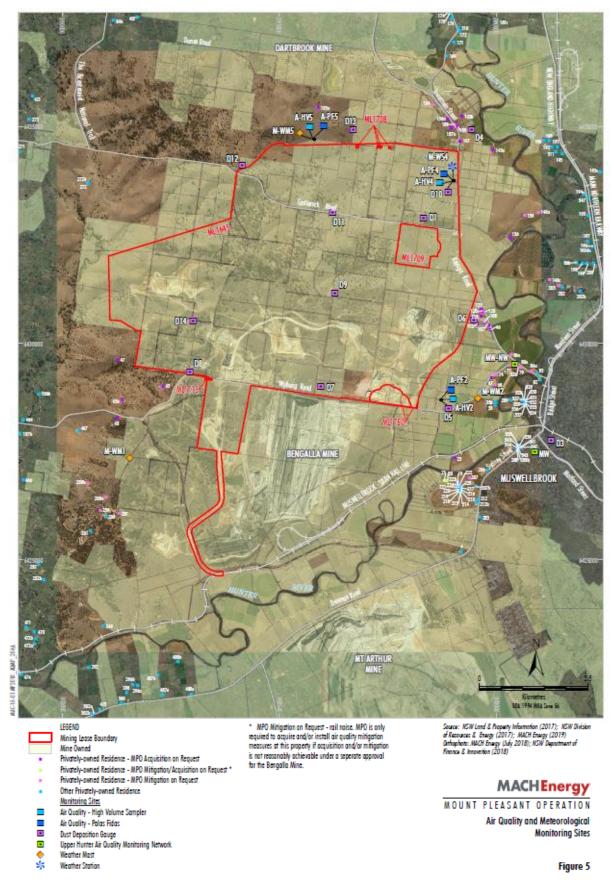


Figure 2-2 – MPO Air Quality and Meteorological Monitoring Network

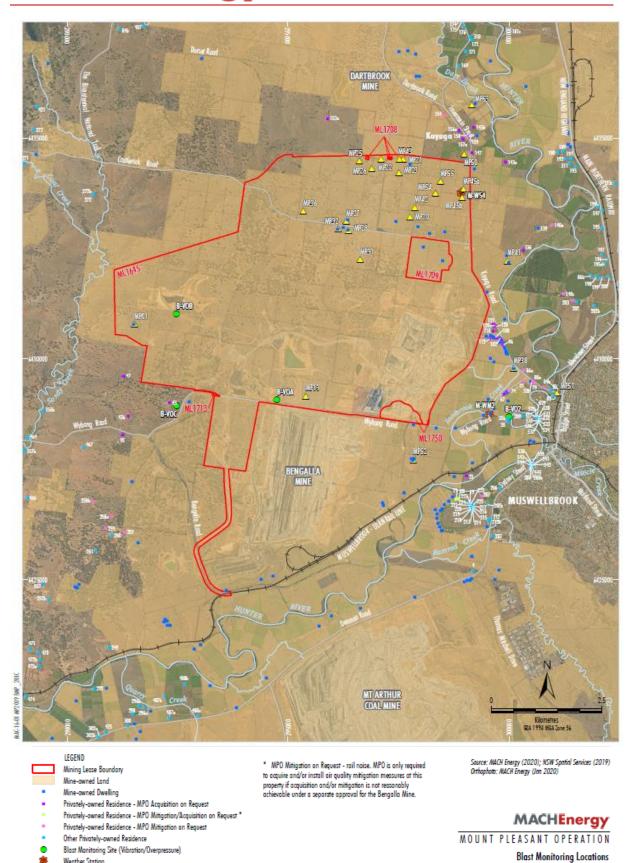


Figure 2-3 – MPO Blast Monitoring Locations

Figure 2

Historic Heritage Site Subject to Blast Criteria

Weather Station

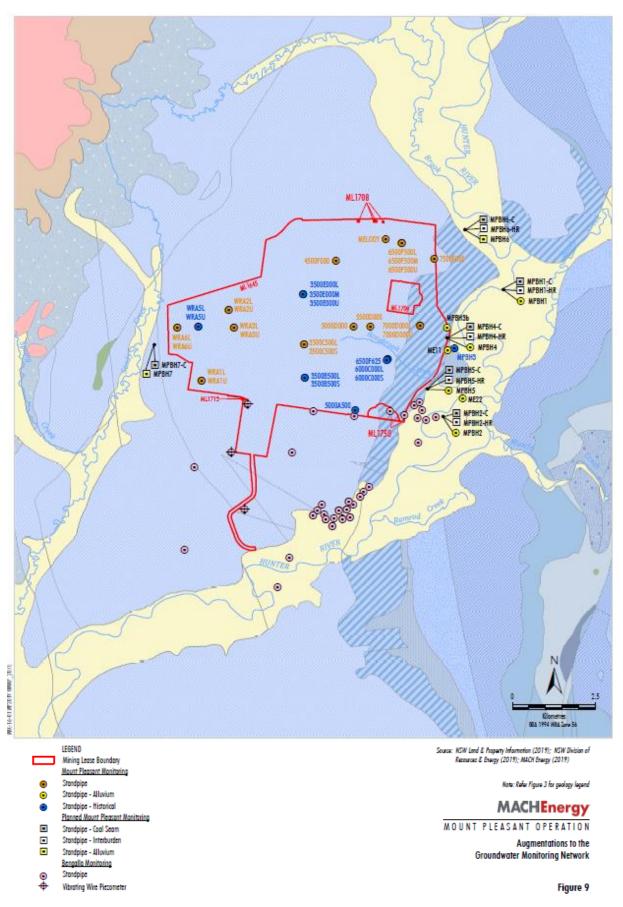


Figure 2-4 – MPO Groundwater Monitoring Network

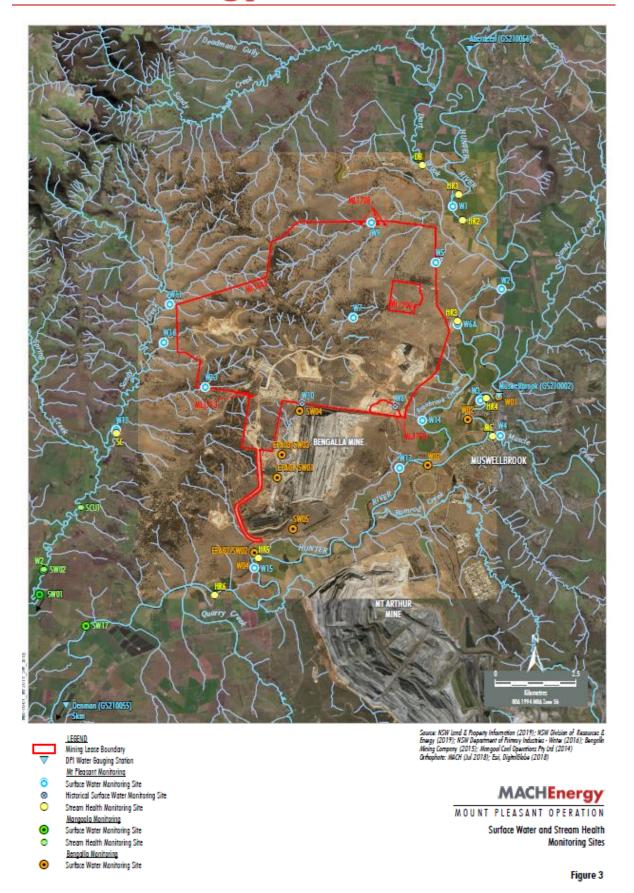


Figure 2-5 – MPO Surface Water Monitoring Network



### 3. Meteorological Monitoring

Weather data is measured continuously at the Kayuga Road (M-WS4) and the Wybong Road (M-WS2) meteorological stations. In addition to air quality parameters, the weather stations measure wind speed and direction, temperature (at 2 m and 10 m), solar radiation, relative humidity, rainfall, atmospheric pressure, and sigma theta.

All meteorological data was captured at M-WS2 (100%) during the April 2020 monitoring period, with the exception of solar radiation data loss (91.6%). The majority of meteorological data was captured at M-WS4 (>96.3%) with the exception of temperature (10m) (37.0%) and temperature (2m) (88.4%).

Throughout April 2020, there was 106.4mm and 101.1mm of rainfall recorded at M-WS2 and M-WS4, respectively.

### 4. Dust Depositional Monitoring

#### 4.1 Methodology

Dust deposition was monitored according to the OEH's Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DECC 2007), which references Australian Standard (AS)/New Zealand Standard (NZS) 3580.10.1:2016 Methods for Sampling and Analysis of Ambient Air: Determination of particulate matter – Deposited matter – Gravimetric Method. The dust deposition monitoring network comprises of 13 dust deposition gauges (DDG). Details of the monitoring locations are shown in **Figure 2-2**.

DDG samples can be contaminated by a variety of means, notably by the presence of insects and bird droppings. Results for contaminated gauges were not included in the calculation of the annual averages as this would result in skewed or misleading results for the purpose of dust deposition assessment. The Australian Standard does not provide criteria for the determination of contamination of a DDG. A gauge sample is determined by AECOM to be contaminated only after reference to field observation sheets, historical monitoring location data, laboratory notes and results, prevailing atmospheric conditions and feedback from field technicians. For example, a gauge sample with a statistically abnormally high insoluble solids result, a low ash residue result (indicating a high level of organic matter) and field notation that bird droppings or insects were present is likely to be considered contaminated.

#### 4.2 Results

The dust deposition exposure period for all gauges commenced on 19 March 2020. Sample collection was undertaken on 20 April 2020 by AECOM with sample analysis performed by SRT, a NATA accredited laboratory. Results are summarised in **Table 4-1**. Annual rolling averages for April 2020 have been provided as an indication of annual performance between April 2019 – April 2020 and does not represent annual average results for 2020 as per Schedule 3, Condition 20 of DA 92/97.



Table 4-1: Dust Depositional Results - April 2020

Location	YTD Insoluble Solids (g/m².month)	Insoluble Solids Annual Rolling Average (g/m².month)
D1	3.2	2.7
D3a	3.2	*
D4	2.9	2.8
D5	3.3	3.7
D6	4.2	6.7^
D7a <sup>1</sup>	7.0	7.9
D8	5.9	5.5
D9	4.5	4.4
D10	2.4	1.9
D11	3.6	3.2
D12	3.2	1.7
D13	5.1	4.2
D14	4.0	4.1
Criterion	-	2.7

Note: Results in **bold** indicate an elevated measurement of adopted assessment criteria \*\*Indicates result unavailable due to contaminated depositional dust gauges for YTD

**Note** <sup>1</sup>: Site D7a is located within close proximity to the northern boundary of a neighbouring mining company's main pit and thus is heavily influenced by this. This site will continue to be monitored, however will not be used to assess compliance or to represent residential receivers in the area.

Contaminated results are not included in the 12 month rolling average. An elevated reading above the annual average criterion for dust deposition (insoluble solids) was recorded at site D6 (6.7 g/m2.month); D7a (7.9 g/m2.month); D8 (5.5 g/m2.month); D9 (4.4 g/m2.month); D13 (4.2 g/m2.month); and D14 (4.1 g/m2.month).

Site D7a is located within close proximity to the northern boundary of a neighbouring mining operation and thus can be influenced by this site. D7a will continue to be monitored, however will not be used to assess compliance or to represent residential receivers in the area.

<sup>\*</sup> No data due to dust gauge removed during construction activities

<sup>^</sup> Elevated results due to earthworks in the vicinity of D6 commencing 13 January 2020 which are not subject to DA 92/97 or EPL 20850.



Furthermore, there are no privately-owned receivers in the vicinity of D8 and D14. Whilst these sites do not represent residence(s) on privately-owned land, they will continue to be monitored in accordance with the MPO Air Quality and Greenhouse Gas Management Plan (MACH Energy, 2019).

Field notes from the April 2020 sampling event noted that all the gauges contained insects and three gauges contained bird droppings. The results of D12 were determined to be contaminated and the result was not included in the annual rolling average.

**Figure 4-1** compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.

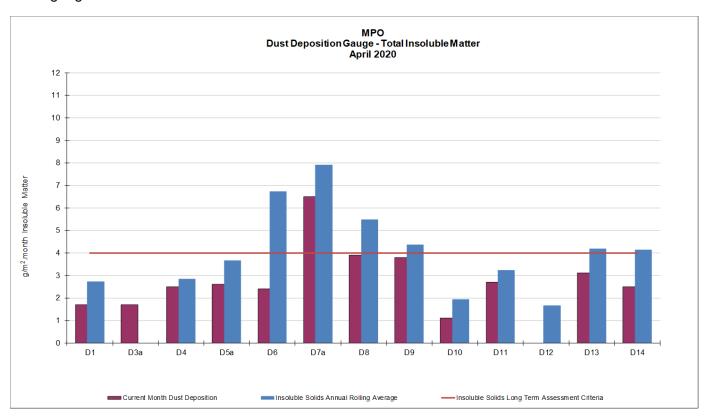


Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – April 2020

## 5. Total Suspended Particulates

All High Volume Air Samplers (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.

Three TSP HVAS units are included in the MPO air quality monitoring network and are displayed in **Table 5-1** below. These units were commissioned in March 2017.



Table 5-1 Total Suspended Particulate Monitoring Sites

ID	Description
A-PF2	Reilly's
M-WS4	Kayuga Road Met Station
A-PF5	Athlone

#### 5.1 Assessment Criteria

TSP is assessed against the guidelines defined in the EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA 2016) and Project Approval DA 92/97. The DA 92/97 specifies an annual average project contribution criterion of 90 µg/m<sup>3</sup>.

#### 5.2 Results

In April 2020 sample collection was undertaken by AECOM with sample analysis performed by SRT, a NATA accredited laboratory. TSP results for the monitoring period are provided in **Table 5-2**. Annual rolling averages for April 2020 have been provided as an indication of annual performance between April 2019 – April 2020 and do not represent annual average results for 2020 as per Schedule 3, Condition 20 of DA 92/97.

Table 5-2 Total Suspended Particulate Monitoring Data – April 2020

Run Date	Assessment	TSP μg/m³				
Ruii Date	Criterion	HVAS A-PF2	HVAS M-WS4	HVAS A-PF5		
2/04/2020	-	32	20	19		
8/04/2020	-	44	28	57		
14/04/2020	-	40	33	22		
20/04/2020	-	49	16	10		
26/04/2020	-	110	40	30		
Monthly Mean	-	55	27	28		
Annual Rolling Average	90	92	59	65		

Note: Results in **bold** indicate an elevated reading

#### 5.3 Discussion

For the reporting period, the annual rolling average TSP data at all sites was below the annual average criterion of 90  $\mu$ g/m³, with the exception of A-PF2 (92  $\mu$ g/m³).

### 6. Real Time Air Quality Monitoring

Continuous particulate matter less than 10  $\mu$ m (PM<sub>10</sub>) and particulate matter less than 2.5  $\mu$ m (PM<sub>2.5</sub>) monitoring was conducted by three Palas Fidas (one utilised for management only) units at MPO during April 2020.



The EPA identification numbers 1 and 2 refer to Palas Fidas units installed on Wybong Road (A-PF2) and Dorset Road (A-PF5), respectively. In addition, a third unit (A-PF4) is installed on Kayuga Road with data used for management purposes only.

Real time  $PM_{10}$  and  $PM_{2.5}$  annual rolling averages for April 2020 have been provided in Section 6.2 and 6.4 respectively, as an indication of annual performance between April 2019 – April 2020 and does not represent annual average results for 2020 as per Schedule 3, Condition 20 of DA 92/97.

### 6.1 PM<sub>10</sub> Results – 24 hour rolling average

There were no elevated PM<sub>10</sub> measurements reported at MPO throughout April 2020. The Muswellbrook NW monitor was operational during all days of April 2020. Real time PM<sub>10</sub> 24 hour rolling average results for April 2020 are presented in **Table 6-1**.

Table 6-1: MPO Palas Fidas PM<sub>10</sub> Data - April 2020

			Table 6-1. MPO Palas Fluas Pivi10 Data						
	A-PF2/EPA ID 1	A-PF4	A-PF5/EPA ID 2	Muswellbrook NW	Muswellbrook NW 24 Hour	A-PF2, A-PF4, A-PF5 24 Hour			
Date		24 hou	our Average Result		Average Limit (μg/m³)	Average Limit (µg/m³)			
1/04/2020	16	14	11	17	44	50			
2/04/2020	17	15	10	18	44	50			
3/04/2020	11	9	7	19	44	50			
4/04/2020	12	12	11	15	44	50			
5/04/2020	22	15	12	9	44	50			
6/04/2020	13	11	8	23	44	50			
7/04/2020	12	10	9	17	44	50			
8/04/2020	12	10	9	22	44	50			
9/04/2020	12	10	9	20	44	50			
10/04/2020	11	10	9	27	44	50			
11/04/2020	17	15	13	20	44	50			
12/04/2020	13	12	9	27	44	50			
13/04/2020	18	17	13	15	44	50			
14/04/2020	16	12	10	21	44	50			
15/04/2020	21	15	10	18	44	50			
16/04/2020	16	13	10	18	44	50			
17/04/2020	22	12	10	20	44	50			
18/04/2020	13	10	8	26	44	50			
19/04/2020	16	14	10	33	44	50			
20/04/2020	16	10	8	31	44	50			
21/04/2020	16	12	9	34	44	50			
22/04/2020	20	11	9	22	44	50			
23/04/2020	21	14	11	15	44	50			
24/04/2020	26	20	14	16	44	50			
25/04/2020	29	18	12	10	44	50			
26/04/2020	28	15	13	17	44	50			
27/04/2020	18	16	11	18	44	50			
28/04/2020	16	12	10	19	44	50			
29/04/2020	20	12	9	15	44	50			



30/04/2020	10	8	7	9	44	50

**Note**: Results in bold indicate elevated readings during adverse weather conditions. Results with "-" indicate dates where data was affected by maintenance or servicing (scheduled and unscheduled)

**Figure 6-1** below shows the results of real-time PM<sub>10</sub> 24 hour rolling average results at MPO air quality monitoring sites April 2020.

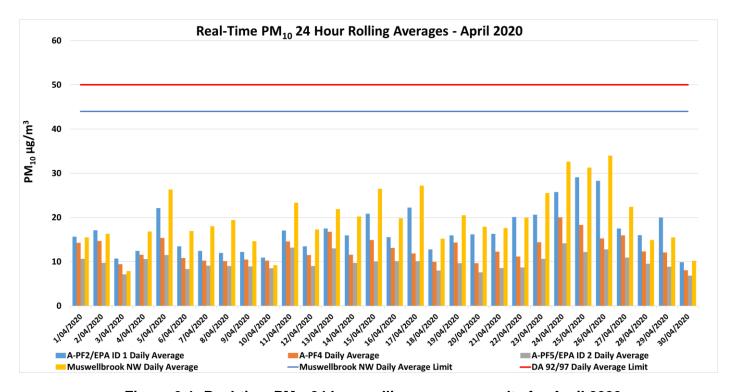


Figure 6-1: Real-time PM<sub>10</sub> 24 hour rolling average results for April 2020.

#### 6.2 PM<sub>10</sub> Results – Annual rolling average

Elevated readings have been measured for the annual rolling average of  $PM_{10}$  data collected since the amendment of the limit from 30  $\mu g/m^3$  to 25  $\mu g/m^3$  during approval of Modification 3 (MOD 3) of DA 92/97, dated 24 August 2018. Wider regional air quality events, including dust storms and bushfires, have contributed to elevated  $PM_{10}$  levels.

Real time PM<sub>10</sub> annual rolling averages for April 2020 are presented in **Figure 6-2** below.



PM<sub>10</sub> µg/m<sup>3</sup>

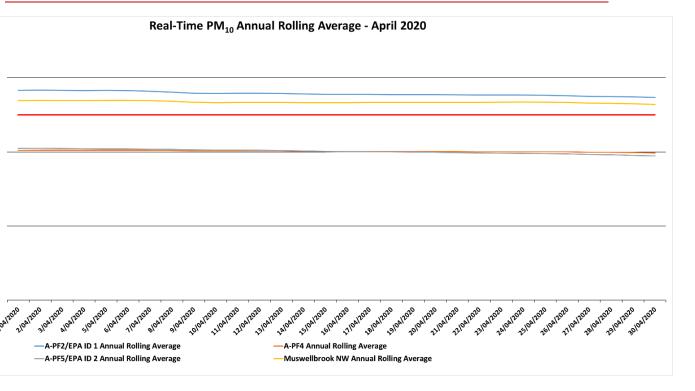


Figure 6-2: Real-time PM<sub>10</sub> Annual Rolling average results for April 2020.

#### 6.3 PM<sub>2.5</sub> Results – 24 hour rolling average

There were no elevated PM<sub>2.5</sub> measurements reported throughout April 2020. Real time PM<sub>2.5</sub> 24 hour rolling average results for April 2020 are presented in **Table 6-2.** 

Table 6-2: MPO Palas Fidas PM<sub>2.5</sub> Data – April 2020

Date	A-PF2/EPA ID 1	A-PF4	A-PF5/EPA ID 2	A-PF2, A-PF4, A-PF5 24 Hour
Date	24	Average Limit (µg/m³)		
1/04/2020	6	6	5	25
2/04/2020	8	7	5	25
3/04/2020	4	4	3	25
4/04/2020	4	3	3	25
5/04/2020	5	4	4	25
6/04/2020	4	4	3	25
7/04/2020	4	4	4	25
8/04/2020	4	4	4	25
9/04/2020	5	4	4	25
10/04/2020	5	5	5	25
11/04/2020	4	4	4	25
12/04/2020	4	4	4	25
13/04/2020	5	5	4	25
14/04/2020	5	4	4	25
15/04/2020	6	5	4	25
16/04/2020	5	4	4	25

17/04/2020	5	4	4	25
18/04/2020	4	4	4	25
19/04/2020	5	4	4	25
20/04/2020	5	4	3	25
21/04/2020	5	4	3	25
22/04/2020	5	4	4	25
23/04/2020	6	5	4	25
24/04/2020	6	6	5	25
25/04/2020	7	5	4	25
26/04/2020	6	5	4	25
27/04/2020	5	5	4	25
28/04/2020	6	6	5	25
29/04/2020	6	5	4	25
30/04/2020	3	3	3	25

**Note**: Results in **bold** indicate elevated readings during adverse weather conditions. Results with "-" indicate dates where data was affected by maintenance or servicing (scheduled and unscheduled)

Real time PM<sub>2.5</sub> 24 hour average results for April 2020 are presented in **Figure 6-3** below.

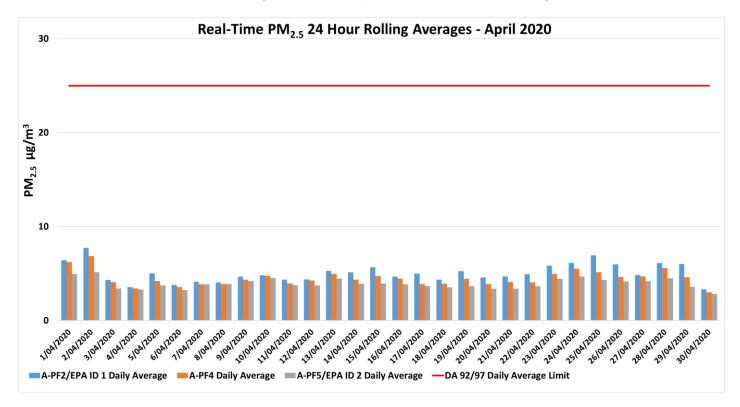


Figure 6-3: Real-time PM<sub>2.5</sub> 24 hour rolling average results for April 2020.

#### 6.4 PM<sub>2.5</sub> Results - Annual rolling average

The requirement of annual rolling average of PM<sub>2.5</sub> data was incepted during MOD 3 of DA 92/97, dated 24 August 2018. Elevated readings have been measured for the annual rolling average of PM<sub>2.5</sub> data collected during April 2020. Wider regional air quality events, including dust storms and bushfires in late 2019, have contributed to elevated PM<sub>2.5</sub> levels.



Real time PM<sub>2.5</sub> annual rolling averages for April 2020 are presented in **Figure 6-4** below.

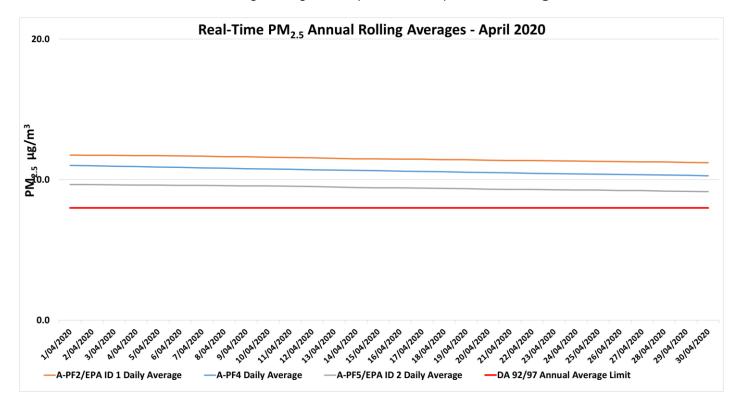


Figure 6-4: Real-time PM<sub>2.5</sub> Annual Rolling average results for April 2020.

## 7. Surface Water Monitoring

#### 7.1 Methodology

Surface water quality is monitored at 15 sites on a monthly basis, with additional monitoring conducted if triggered by a rain event. A comprehensive suite of analysis is performed at these sites on a quarterly basis.

#### 7.2 Assessment Criteria

Surface waters were assessed in accordance with site specific trigger values that have been developed using the ANZECC (2000) guidelines for sites that contain a minimum of two years of monthly data. Sites with insufficient data are assessed on default trigger values adopted from ANZECC (2000) guidelines.

#### 7.3 Results

Monthly and rain event surface water monitoring was conducted by AECOM on 6 April 2020. Laboratory analysis was performed by SRT and SGS, both NATA accredited laboratories. Monthly monitoring results for pH, EC, TSS and TDS are presented in **Table 7-1**.



Table 7-1 – MPO Monthly Surface Water Monitoring Results – 6 April 2020

Station	рН	Electrical Conductivity (EC) (μs/cm)¹	Total Suspended Solids (TSS) (mg/L)	Total Dissolved Solids (TDS) (mg/L)
W1	7.9	360	71	242
W2	7.9	390	77	221
W3	7.8	360	138	189
W4	7.4	1550	22	872
W5	*	*	*	*
W6A	7.9	370	85	267
W7	*	*	*	*
W9	*	*	*	*
W11	^	۸	^	۸
W12	7.9	900	172	597
W13	7.3	160	224	260**
W14	*	*	*	*
W15	7.6	320	243	226
W16	7.6	180	212	261**
W17	^	۸	^	^

Note: Results in bold indicate elevated reading of adopted assessment criteria.

Six of the fifteen monitoring locations were found to be dry or were not safely accessible on 6 April 2020. All sites sampled were below or inside the trigger level values with the exception of W2 and W6A. An investigation into the elevated measurement will be triggered if this occurs for three consecutive sampling events in accordance MPO Water Management Plan (MACH Energy, 2019).

## 8. Groundwater Monitoring

Groundwater monitoring was not undertaken during April 2020. The next groundwater monitoring event is scheduled for May 2020.

## 9. Noise Monitoring

Attended noise monitoring was undertaken during the night period of 22 April 2020 at 6 monitoring locations as per the MPO Noise Management Plan (MACH Energy, 2019) in accordance with DA 92/97 and EPL 20850.

<sup>\*</sup>Dry or insufficient water to sample.

<sup>\*\*</sup> TDS result calculated due to high TSS containing colloidal clay particles which have interfered with the Laboratory TDS result.

<sup>^</sup> Indicates no safe access due to wet weather conditions

<sup>&</sup>lt;sup>1</sup> Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI3 (pH) and In-house method Q4AN(EV)-332-WI2 (EC).



#### 9.1 Results

The results for night time attended noise monitoring for noise generated by MPO in April 2020 against noise criteria is shown in **Table 9-1**; **Table 9-2**; and **Table 9-3**.

Table 9-1 – L<sub>A1,1min</sub> Generated by MPO: Attended Night Monitoring – 22 April 2020

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies <sup>1</sup>	MPO Only L <sub>Aeq</sub> dB <sup>2.4</sup>	Exceedance dB <sup>3,4</sup>
N-AT1	22/04/20 23:47	1.6	D	45	Yes	IA	Nil
N-AT2	22/04/20 22:01	0.8	F	45	Yes	32	Nil
N-AT3	22/04/20 23:04	0.8	E	45	Yes	41	Nil
N-AT4	22/04/20 23:32	1.0	E	45	Yes	50	5
N-AT5	22/04/20 00:12	2.1	D	45	Yes	36	Nil
N-AT6	22/04/20 22:39	1.9	G	45	No	IA	NA

#### Notes:

- As per Condition L2.3 of EPL 20850, noise emission limits do not apply during wind speeds greater than 3m/s at 10m above ground level, or stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level, or stability category G temperature inversion conditions;
- 2. Estimated or measured L<sub>A1,1minute</sub> attributed to MPO;
- 3. NA in exceedance column means meteorological conditions outside those specified in Condition L2.3 of EPL 20850 and thus criterion is not applicable; and
- 4. Bold results indicate exceedance of criteria.

Table 9-2 – L<sub>Aeq,15min</sub> Generated by MPO: Attended Night Monitoring – 22 April 2020

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies <sup>1</sup>	MPO Only L <sub>Aeq</sub> dB <sup>2.4</sup>	Exceedance dB <sup>3,4</sup>
N-AT1	22/04/20 23:47	1.6	D	43	Yes	IA	Nil
N-AT2	22/04/20 22:01	0.8	F	36	Yes	25	Nil
N-AT3	22/04/20 23:04	0.8	E	41	Yes	35	Nil
N-AT4	22/04/20 23:32	1.0	E	42	Yes	36	Nil
N-AT5	22/04/20 00:12	2.1	D	40	Yes	<30	Nil
N-AT6	22/04/20 22:39	1.9	G	35	No	IA	NA

#### Notes:

 As per Condition L2.3 of EPL 20850, noise emission limits do not apply during wind speeds greater than 3m/s at 10m above ground level, or stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level, or stability category G temperature inversion conditions;



- Estimated or measured LAeq, 15minute attributed to MPO;
- 3. NA in exceedance column means meteorological conditions outside those specified in Condition L2.3 of EPL 20850 and thus criterion is not applicable; and
- 4. Bold results indicate exceedance of criteria.

Table 9-3 - L<sub>Aeq,period</sub> Cumulative Noise: Attended Night Monitoring - 22 April 2020

Location	Start Date and Time	Cumulative Noise Criterion LAeq dB	Measured Mining Only L <sub>Aeq,period</sub> dB <sup>1,2</sup>	Exceedance dB
N-AT1	22/04/20 23:47	40	Nil	Nil
N-AT2	22/04/20 22:01	40	Nil	Nil
N-AT3	22/04/20 23:04	40	Nil	Nil
N-AT4	22/04/20 23:32	40	37	Nil
N-AT5	22/04/20 00:12	40	<30	Nil
N-AT6	22/04/20 22:39	40	Nil	Nil

#### Notes:

- These are the results for MPO and all other mining sources. 15-minute measurements have been assumed to apply across the entire night period as a conservative measure and to represent "worst case" results; and
- 2. By definition, cumulative noise refers to two or more noise sources. If only one source of mining is audible, or if MPO is inaudible, the measured cumulative noise defined her is 'Nii'.

The purpose of the noise monitoring is to quantify and describe the existing acoustic environment around the mining operation and compare results with relevant limits as per the Noise Management Plan (MACH Energy, 2019). Noise levels from MPO complied with noise limits at all monitoring locations during the April 2020 monitoring period, with the exception of the elevated L<sub>A1,1min</sub> measurement at N-AT4. This was reported to both the EPA and DPIE on 29 April 2020 and an investigation into the event has commenced.

### 10. Blast Monitoring

There were 6 blast events during April (a total of 24 blasts YTD). Results for April 2020 are presented in **Table 10-1**. All blast results during the April 2020 monitoring period were below the criteria in Schedule 3, Condition 10 of DA 92/97 and EPL 20850 and thus the MPO remains compliant in 2020 YTD.



## Table 10-1 - MPO Blast Monitoring Results - April 2020

Day & Date Fired	Time Fired	Vibration (mm/s) BVOA	Overpressure (dBL) BVOA	Vibration (mm/s) BVOC	Overpressure (dBL) BVOC	Vibration (mm/s) BVO2	Overpressure (dBL) BVO2
Friday 03/04/20	16:16	0.610	99.1	0.400	95.2	1.230	103.9
Thursday 09/04/20	13:19	0.890	112.4	0.490	107.9	2.110	110.2
Monday 20/04/20	15:45	0.950	103.7	0.440	93.3	1.930	106.9
Tuesday 21/04/20	13:04	1.370	101.4	1.200	102	1.590	108
Thursday 23/04/20	13:03	1.060	103.9	0.310	97	1.060	103.9
Wednesday 29/04/20	12:59	0.570	98.2	0.380	100.8	1.770	108.3