

**Mount Pleasant Operation
Monthly Environmental Monitoring Report**

August 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 August 2020
Reporting Period End Date	31 August 2020
Date All Data Received	29 September 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; and
- **Figure 2-5** shows the MPO Surface Water Monitoring network.

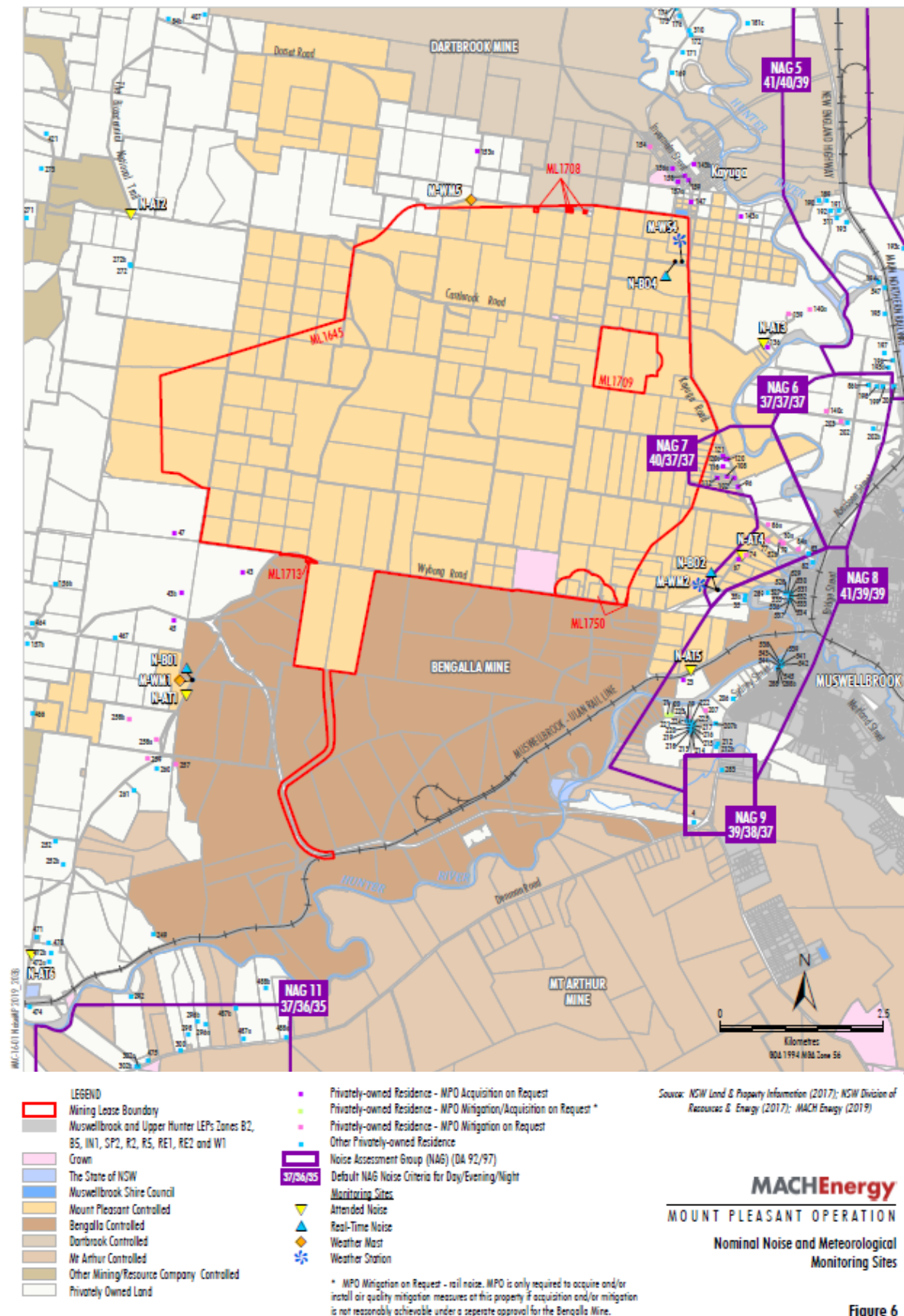


Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups and Locations

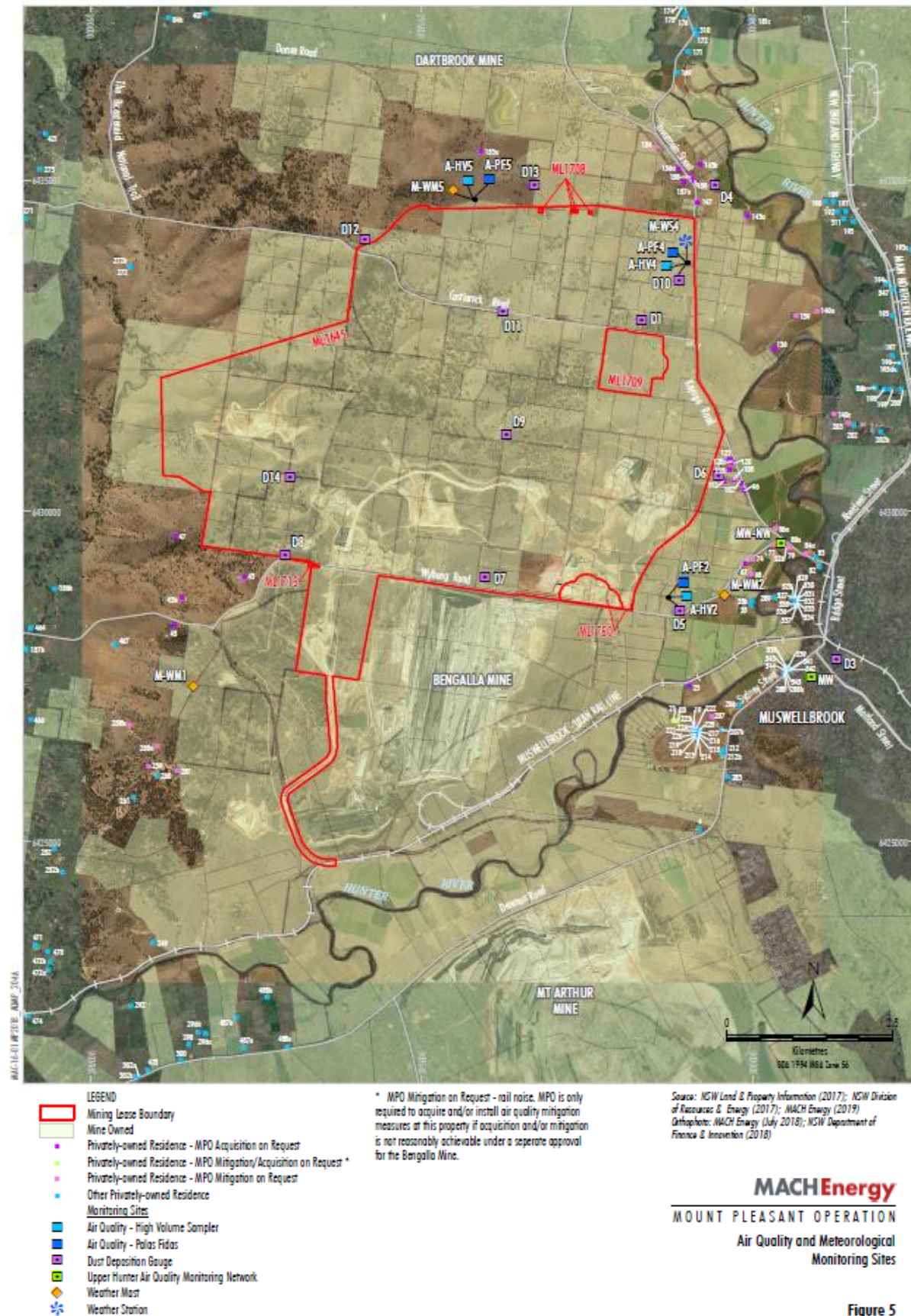


Figure 2-2 – MPO Air Quality and Meteorological Monitoring Network

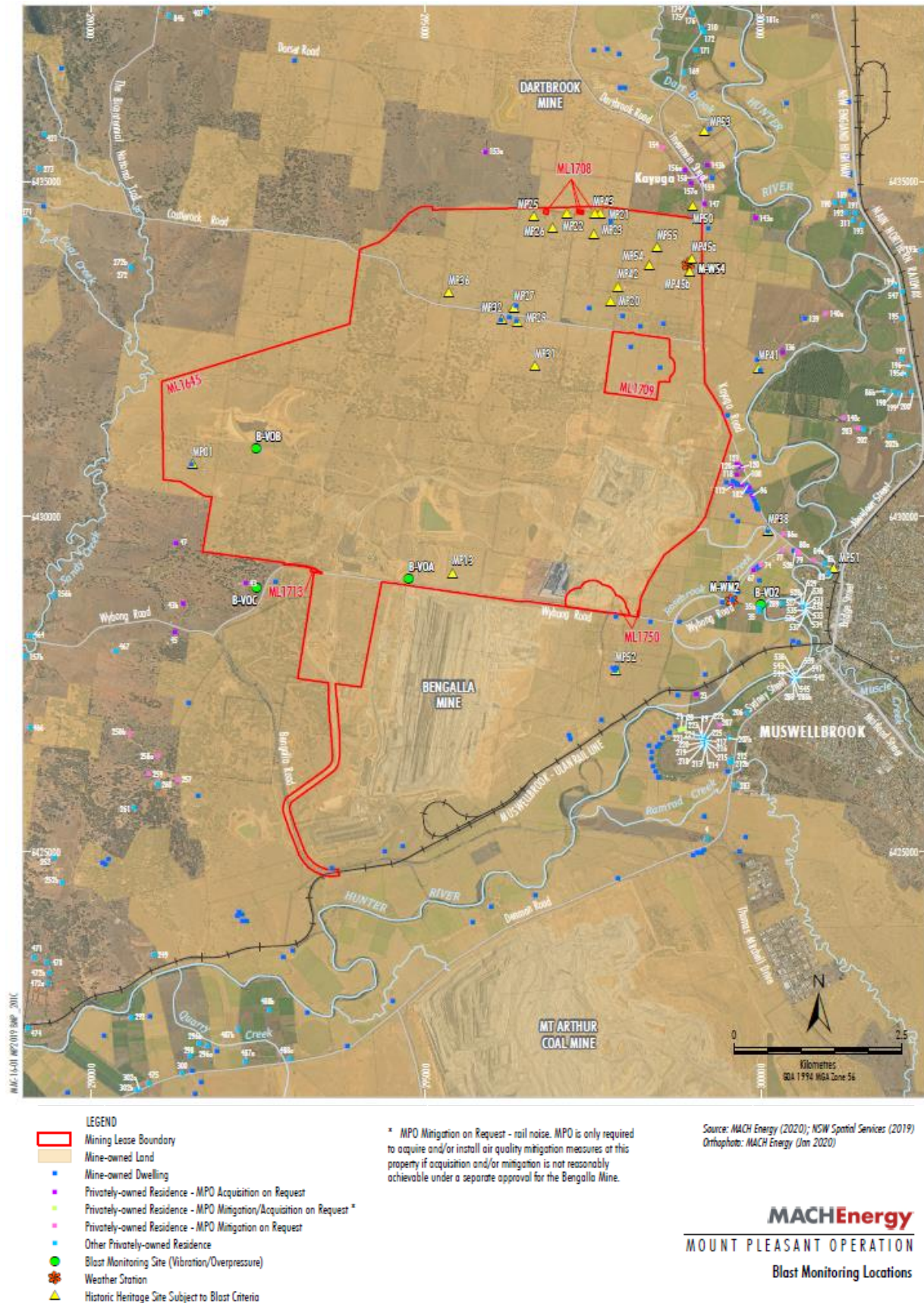
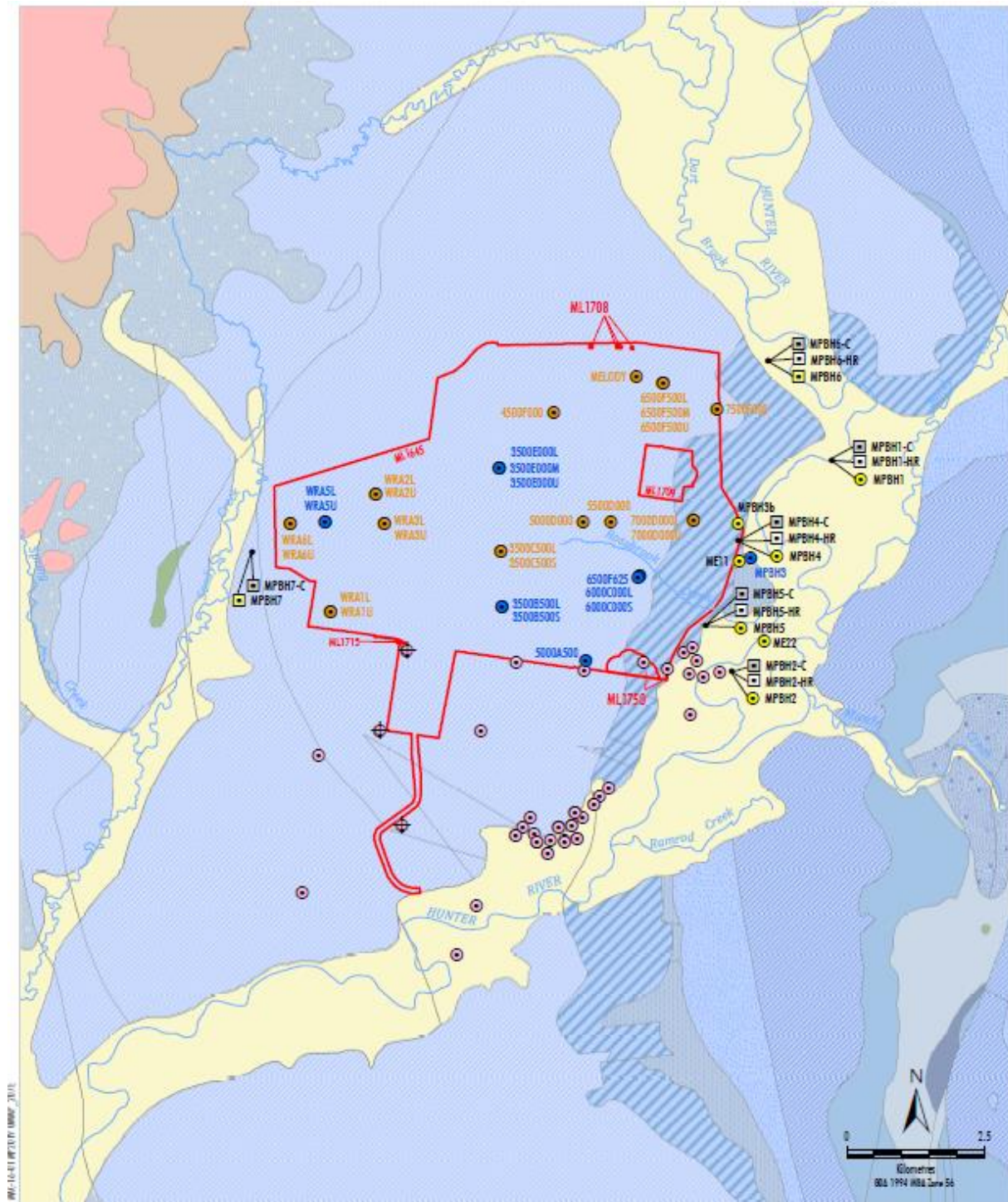


Figure 2-3 – MPO Blast Monitoring Locations

Figure 2



- LEGEND**
- Mining Lease Boundary
 - Mount Pleasant Monitoring
 - Standpipe
 - Standpipe - Alluvium
 - Standpipe - Historical
 - Planned Mount Pleasant Monitoring
 - Standpipe - Coal Seam
 - Standpipe - Interburden
 - Standpipe - Alluvium
 - Standpipe
 - ⊕ Vibrating Wire Piezometer

Source: NSW Land & Property Information (2019); NSW Division of Resources & Energy (2019); MACH Energy (2019)

Note: Refer Figure 3 for geology legend

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MOUNT PLEASANT OPERATION
Augmentations to the
Groundwater Monitoring Network

Figure 9

Figure 2-4 – MPO Groundwater Monitoring Network



Figure 3

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.

The majority of meteorological data was captured at M-WS2 (>95.9%) during the August 2020 monitoring period, with the exception of solar radiation data loss (89.7%) and temperature (2m) (94.5%). The majority of meteorological data was captured at M-WS4 (>95.6%) during the August 2020 monitoring period with the exception of temperature (2m) (89.8%).

Throughout August 2020, there was 30.4 and 26.4mm 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 20 July 2020. Sample collection was undertaken on 19 August 2020 by AECOM with sample analysis performed by SRT, a NATA accredited laboratory. Results are summarised in **Table 4-1**. Annual rolling averages for August 2020 have been provided as an indication of performance between August 2019 – August 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 – August 2020

Location	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
D1	2.7	2.8
D3a	2.4	**
D4	2.7	2.7
D5	3.0	3.2
D6^	3.6	6.6
D7a ¹	6.6	6.5
D8	5.0	5.2
D9	4.4	4.5
D10	1.7	1.9
D11	3.5	3.5
D12	2.4	2.4
D13	4.6	4.6
D14	3.5	4.2
Criterion	-	4
<p><i>Note: Results in bold indicate an elevated measurement of adopted assessment criteria</i> <i>**Indicates result unavailable due to contaminated depositional dust gauges for YTD</i></p>		

Note 1: 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.

* No data due to dust gauge removed during construction activities

^ 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.

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 (6.6 g/m².month); D7a (6.5 g/m².month); D8 (5.2 g/m².month); D9 (4.5 g/m².month); D13 (4.6 g/m².month); and D14 (4.2 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. 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 August 2020 sampling event noted that all the gauges contained insects; four gauges contained bird droppings. The results of D9 and D12 were determined to be contaminated and subsequently 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.

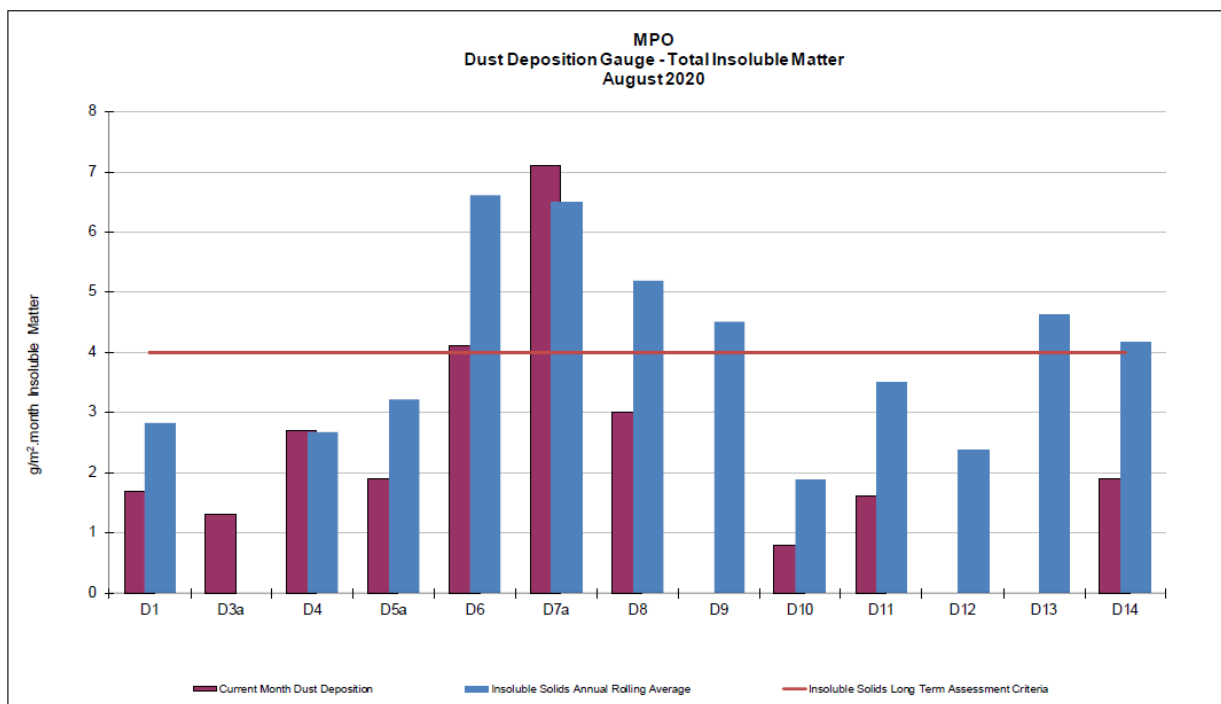


Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – August 2020

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 plus background criterion of 90 µg/m³.

5.2 Results

In August 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 August 2020 have been provided as an indication of performance between August 2019 – August 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 – August 2020

Run Date	Assessment Criterion	TSP µg/m ³		
		HVAS A-PF2	HVAS M-WS4	HVAS A-PF5
6/08/2020	-	41	27	23
12/08/2020	-	30	22	7
18/08/2020	-	29	6	3
24/08/2020	-	63	7	8
30/08/2020	-	52	23	14
Monthly Mean	-	43	17	11
Annual Rolling Average	90	79	54	60

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 µg/m³.

6. Real Time Air Quality Monitoring

Continuous particulate matter less than 10 µm (PM₁₀) and particulate matter less than 2.5 µm (PM_{2.5}) monitoring was conducted by three Palas Fidas (one utilised for management only) units at MPO during August 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 PM₁₀ and PM_{2.5} 12-month rolling averages for August 2020 have been provided in Section 6.2 and 6.4 respectively, as an indication of performance between August 2019 – August 2020 and do not represent annual average results for 2020 as per Schedule 3, Condition 20 of DA 92/97.

6.1 PM₁₀ Results – 24 hour rolling average

There were no elevated PM₁₀ measurements reported at MPO throughout August 2020. The Muswellbrook NW monitor was operational during all days of August 2020. Real time PM₁₀ 24 hour rolling average results for August 2020 are presented in **Table 6-1**.

Table 6-1: MPO Palas Fidas PM₁₀ Data – August 2020

Date	A-PF2/EPA ID 1	A-PF4	A-PF5/EPA ID 2	Muswellbrook NW	Muswellbrook NW 24 Hour Average Limit (µg/m³)	A-PF2, A-PF4, A-PF5 24 Hour Average Limit (µg/m³)
	24 hour Average Result					
1/08/2020	14	11	10	17	44	50
2/08/2020	13	10	8	14	44	50
3/08/2020	10	9	6	14	44	50
4/08/2020	15	8	7	9	44	50
5/08/2020	14	7	6	21	44	50
6/08/2020	15	12	12	10	44	50
7/08/2020	14	12	11	16	44	50
8/08/2020	14	9	6	16	44	50
9/08/2020	8	4	4	11	44	50
10/08/2020	9	9	6	9	44	50
11/08/2020	-	13	7	10	44	50
12/08/2020	-	13	7	12	44	50
13/08/2020	16	11	6	16	44	50
14/08/2020	19	17	6	17	44	50
15/08/2020	11	6	5	18	44	50
16/08/2020	11	5	4	11	44	50
17/08/2020	10	5	4	7	44	50
18/08/2020	8	6	5	6	44	50
19/08/2020	44	27	19	7	44	50
20/08/2020	22	20	15	51	44	50
21/08/2020	11	7	5	32	44	50
22/08/2020	12	6	5	11	44	50
23/08/2020	11	6	5	15	44	50
24/08/2020	10	5	5	15	44	50

25/08/2020	10	7	5	9	44	50
26/08/2020	18	12	8	11	44	50
27/08/2020	15	8	5	21	44	50
28/08/2020	15	12	7	14	44	50
29/08/2020	18	15	11	20	44	50
30/08/2020	20	14	8	21	44	50
31/08/2020	28	19	10	19	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 PM₁₀ 24 hour rolling average results at MPO air quality monitoring sites August 2020.

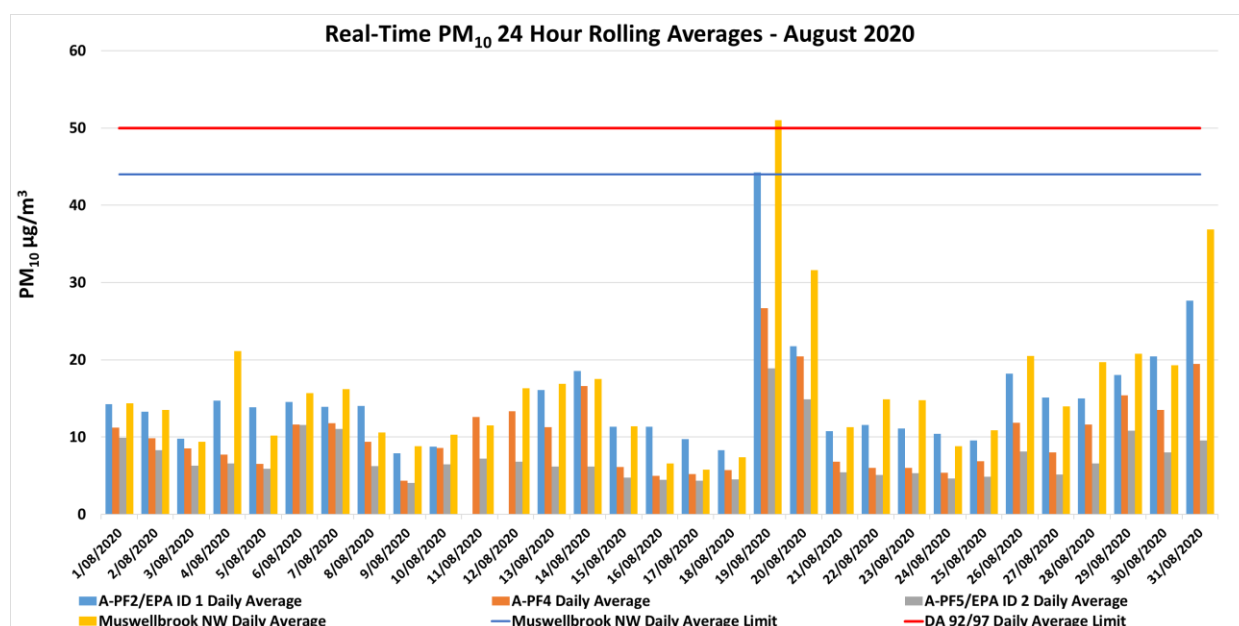


Figure 6-1: Real-time PM₁₀ 24 hour rolling average results for August 2020.

6.2 PM₁₀ Results – Annual rolling average

Elevated readings have been measured for the annual rolling average of PM₁₀ data collected since the amendment of the limit from 30 µg/m³ to 25 µg/m³ 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 PM₁₀ levels.

Real time PM₁₀ annual rolling averages for August 2020 are presented in **Figure 6-2** below.

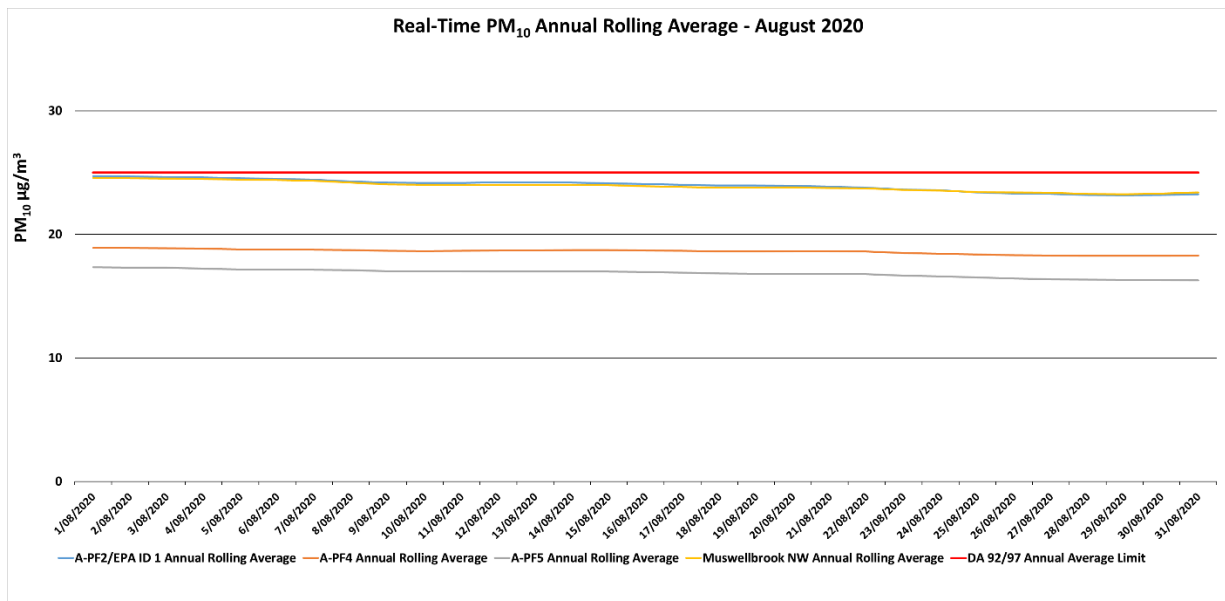


Figure 6-2: Real-time PM₁₀ Annual Rolling average results for August 2020.

6.3 PM_{2.5} Results – 24 hour rolling average

There were no elevated PM_{2.5} measurements reported throughout August 2020. Real time PM_{2.5} 24 hour rolling average results for August 2020 are presented in **Table 6-2**.

Table 6-2: MPO Palas Fidas PM_{2.5} Data – August 2020

Date	A-PF2/EPA ID 1	A-PF4	A-PF5/EPA ID 2	A-PF2, A-PF4, A-PF5 24 Hour Average Limit (µg/m³)
	24 hour Average Result			
1/08/2020	6	5	4	25
2/08/2020	5	4	3	25
3/08/2020	4	4	3	25
4/08/2020	4	3	3	25
5/08/2020	4	3	3	25
6/08/2020	4	4	3	25
7/08/2020	5	5	4	25
8/08/2020	7	6	3	25
9/08/2020	3	2	2	25
10/08/2020	4	4	3	25
11/08/2020	-	6	4	25
12/08/2020	-	6	3	25
13/08/2020	5	4	3	25
14/08/2020	6	5	3	25
15/08/2020	4	3	2	25
16/08/2020	3	2	2	25
17/08/2020	3	2	2	25
18/08/2020	3	3	2	25
19/08/2020	7	6	5	25
20/08/2020	5	5	5	25

21/08/2020	3	3	3	25
22/08/2020	3	3	2	25
23/08/2020	3	3	3	25
24/08/2020	3	3	2	25
25/08/2020	4	3	2	25
26/08/2020	5	4	3	25
27/08/2020	4	3	3	25
28/08/2020	4	3	3	25
29/08/2020	6	5	4	25
30/08/2020	8	6	4	25
31/08/2020	7	6	4	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_{2.5} 24 hour average results for August 2020 are presented in **Figure 6-3** below.

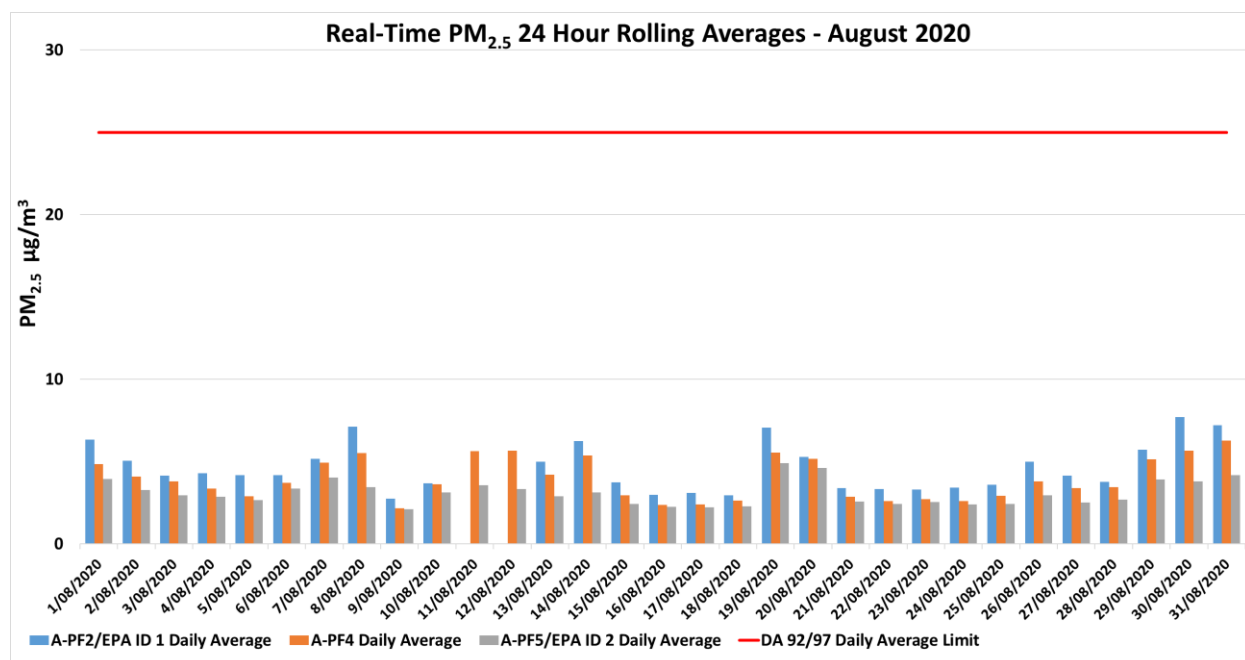


Figure 6-3: Real-time PM_{2.5} 24 hour rolling average results for August 2020.

6.4 PM_{2.5} Results - Annual rolling average

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

Real time PM_{2.5} annual rolling averages for August 2020 are presented in **Figure 6-4** below.

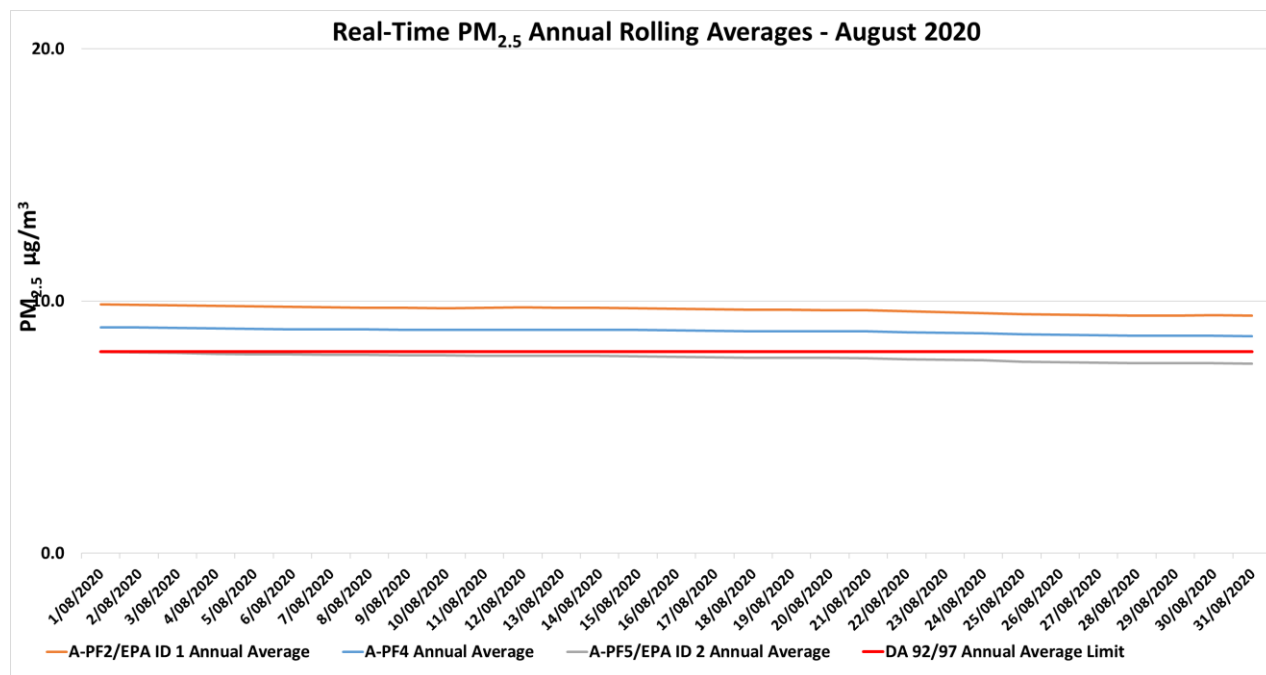


Figure 6-4: Real-time PM_{2.5} Annual Rolling average results for August 2020.

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 as per the MPO Water Management Plan (MACH Energy, 2019) 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 28 August 2020. The quarterly analytical suite was also collected. Laboratory analysis was performed by SRT; SGS; and ALS, all of which are 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 – 28 August 2020

Station	pH	Electrical Conductivity (EC) (µs/cm) ¹	Total Suspended Solids (TSS) (mg/L)	Total Dissolved Solids (TDS) (mg/L)
W1	^	^	^	^
W2	8.3	620	<5	348
W3	8.3	630	8	355
W4	7.6	1300	<5	808
W5	*	*	*	*
W6A	8.3	600	<5	340
W7	*	*	*	*
W9	*	*	*	*
W11	8.4	4200	<5	2330
W12	7.8	4150	<5	2330
W13	*	*	*	*
W14	*	*	*	*
W15	8.4	680	9	376
W16	*	*	*	*
W17	8.2	660	46	365

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

*Dry or insufficient water to sample.

** TDS result calculated due to high TSS containing colloidal clay particles which have interfered with the Laboratory TDS result.

^ Indicates no safe access due to wet weather conditions

¹ 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).

*** Calculated result due to interference from colloidal material interfering with laboratory result.

Seven of the fifteen monitoring locations were found to be dry or were not safely accessible on 28 August 2020. All sites sampled were below or inside the trigger level values with the exception of W17 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

The quarterly groundwater monitoring was conducted on 11 – 14, 25 – 26 August and 3 September 2020. Water level results for the groundwater bores are presented in **Table 8-1**. The quarterly pH and EC results are presented in **Table 8-2** and **Table 8-3**, respectively.

Table 8-1 - MPO Quarterly Groundwater Water Level Results

Monitoring Location/ ID	Water Level Trigger Range		Current Month Water Level (DTW)	May 2020 Water Level (DTW)	Feb/Mar 2020 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
WRA1L	-	± 0.5m	4.94	6.11	6.37	
WRA1U	-	± 0.5m	*	*	*	
WRA3L	-	± 0.5m	14.02	15.14	15.84	
WRA3U	-	± 0.5m	3.76	4.41	4.88	
WRA5L	-	± 0.5m	0.00	0.00	0.00	
WRA5U	-	± 0.5m	0.84	0.65	0.65	
WRA6L	-	± 0.5m	1.33	1.75	2.82	
WRA6U	-	± 0.5m	3.37	3.84	4.21	
MPBH1	9.71	10.70	9.90	10.06	10.03	No
MPBH2	12.20	14.20	12.57	12.54	12.51	No
MPBH3b	12.00	Dry (Or 14.0m)	12.17	12.21	12.38	No
MPBH4	-	± 0.5m	12.19	12.31	12.37	
MPBH5	-	± 0.5m	*	*	*	
MPBH1-C***	-	± 0.5m	**	10.17	10.21	
MPBH1-HR***	-	± 0.5m	**	10.12	10.21	
MPBH2-C***	-	± 0.5m	**	12.87	12.91	
MPBH2-HR**	-	± 0.5m	**	12.84	12.86	
MPBH4-C***	-	± 0.5m	11.77	11.90	57.66	
MPBH4-HR***	-	± 0.5m	51.06	51.05	50.76	
MPBH5-C***	-	± 0.5m	12.35	12.28**	12.79	
MPBH5-HR***	-	± 0.5m	12.46	12.39	12.34	
MPBH6***	-	± 0.5m	10.30	10.44	10.39	
MPBH6-C***	-	± 0.5m	12.62	12.69	12.67	
MPBH6-HR***	-	± 0.5m	11.06	11.22	11.68	
MPBH7***	-	± 0.5m	9.51	9.50	9.71	
MPBH7-C***	-	± 0.5m	18.74	19.02	19.01	
3500C500 (L)	-	± 0.5m	53.36	58.04	58.06	
3500C500 (S)	-	± 0.5m	25.86	26.08	26.10	
4500F000	-	± 0.5m	28.97	31.29	31.36	
5000D000	-	± 0.5m	106.56	101.71	100.52	
5500D000	-	± 0.5m	86.56	84.09	-	

Monitoring Location/ ID	Water Level Trigger Range		Current Month Water Level (DTW)	May 2020 Water Level (DTW)	Feb/Mar 2020 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
6500F500L	-	± 0.5m	53.08	53.07	53.01	
6500F500M	-	± 0.5m	54.67	54.85	54.64	
6500F500U	-	± 0.5m	*	*	*	
6500F625	-	± 0.5m	14.39	15.11	22.67	
Melody	-	± 0.5m	11.64	11.49	21.87	
7500F000	-	± 0.5m	36.42	36.44	36.39	

* Dry/insufficient water to sample

** Bore appeared to be blocked

*** New site – results may not be representative of groundwater conditions at time of sampling due to ongoing well development

- Trigger Levels are not applicable due to non-alluvial bore

Note: An investigation is triggered when the water levels in any **alluvial bores** exceed the 80th percentile and/ or trigger level. Results shown in **bold** indicate that the bore has exceeded the adopted assessment criterion for changes in standing water level of ± 0.5m from the previous measurement.

Table 8-2 - MPO Quarterly Groundwater pH results

Monitoring Location/ ID	pH Trigger Range		Current Month pH	May 2020 pH	Mar 2020 pH	Triggered (Yes/No)
	20 th Percentile	80 th Percentile				
WRA1I	6.0	8.5	7.0	7.0	7.0	No
WRA1U	6.0	8.5	*	*	*	No
WRA3L	6.0	8.5	6.9	6.8	6.8	No
WRA3U	6.0	8.5	7.5	7.6	7.2	No
WRA5L	6.0	8.5	7.2	7.2	7.2	No
WRA5U	6.0	8.5	7.2	7.3	7.3	No
WRA6L	6.0	8.5	7.0	7.0	6.9	No
WRA6U	6.0	8.5	7.0	6.8	6.8	No
MPBH1	6.0	8.5	7.0	7.0	7.0	No
MPBH2	6.0	8.5	6.8	6.9	6.8	No
MPBH3b	6.0	8.5	8.2	7.6	7.3	No
MPBH4	6.0	8.5	6.8	6.9	7.0	No
MPBH5	6.0	8.5	*	*	*	-
MPBH1-C***	6.0	8.5	**	8.8	7.5	-
MPBH1-HR***	6.0	8.5	**	8.8	8.0	-
MPBH2-C***	6.0	8.5	**	12.3	12.3	-
MPBH2-HR***	6.0	8.5	**	9.1	11.2	-
MPBH4-C***	6.0	8.5	7.5	8.2	8.4	-
MPBH4-HR***	6.0	8.5	7.4	*	8.3	-
MPBH5-C***	6.0	8.5	11.5	12.0	12.2	-

Monitoring Location/ ID	pH Trigger Range		Current Month pH	May 2020 pH	Mar 2020 pH	Triggered (Yes/No)
	20 th Percentile	80 th Percentile				
MPBH5-HR***	6.0	8.5	7.4	7.5	7.4	-
MPBH6***	6.0	8.5	7.0	7.0	7.0	-
MPBH6-C***	6.0	8.5	7.9	7.9	7.8	-
MPBH6-HR***	6.0	8.5	7.2	7.4	7.2	-
MPBH7***	6.0	8.5	7.3	7.3	7.2	-
MPBH7-C***	6.0	8.5	7.6	7.6	7.6	-
3500C500 (L)	6.0	8.5	7.5	7.3	7.4	No
3500C500 (S)	6.0	8.5	7.2	7.2	7.2	No
4500F000	6.0	8.5	6.8	6.8	6.7	No
5000D000	6.0	8.5	7.1	7.0	6.9	No
5500D000	6.0	8.5	7.1	7.2	-	-
6500F500L	6.0	8.5	7.4	7.4	7.4	No
6500F500M	6.0	8.5	7.2	7.3	7.3	No
6500F500U	6.0	8.5	*	*	*	*
6500F625	6.0	8.5	6.9	7.0	6.9	No
Melody	6.0	8.5	7.0	7.0	7.1	No
7500F000	6.0	8.5	7.9	7.7	7.7	No

* Dry/insufficient water to sample

** Bore appeared to be blocked

*** New site - results may not be representative of groundwater conditions at time of sampling due to ongoing well development

- indicated no trigger limit identified

An investigation is triggered when pH values are recorded outside the baseline range (20th – 80th percentile) for three consecutive readings. Results outside this range are shown in **bold**.

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).

Table 8-3 - MPO Quarterly Groundwater EC results

Monitoring Location/ ID	EC Trigger Range	Current Month EC	May 2020 EC	March 2020 EC	Triggered (Yes/No)
	Maximum Beneficial Use Trigger				
WRA1I	7800	4150	4200	4300	No
WRA1U	^	*	*	*	
WRA3L	22000	15900	16100	16000	No
WRA3U	22000	2350	3050	5450	No
WRA5L	7800	4050	3550	2850	No
WRA5U	7800	4000	3450	2750	No
WRA6L	7800	6800	6550	6650	No
WRA6U	22000	10300	10700	10900	No
MPBH1	800	460	450	500	No

Monitoring Location/ ID	EC Trigger Range	Current Month EC	May 2020 EC	March 2020 EC	Triggered (Yes/No)
	Maximum Beneficial Use Trigger				
MPBH2	930	750	750	760	No
MPBH3b	7800	4100	4150	4050	No
MPBH4	^	6200	6000	5500	No
MPBH5	^	*	*	*	
MPBH1-C***	^	**	1250	830	-
MPBH1-HR***	^	**	1150	580	-
MPBH2-C***	^	**	3800	4200	-
MPBH2-HR***	^	**	1300	830	-
MPBH4-C***	^	3450	3500	3450	-
MPBH4-HR***	^	6100	*	3400	-
MPBH5-C***	^	1150	1800	3100	-
MPBH5-HR***	^	800	800	830	-
MPBH6***	^	1300	1250	1250	-
MPBH6-C***	^	7250	6800	6650	-
MPBH6-HR***	^	1350	4900	6400	-
MPBH7***	^	14400	13700	11600	-
MPBH7-C***	^	9900	10400	11000	-
3500C500 (L)	7800	3950	3950	4000	No
3500C500 (S)	7800	4800	4800	4950	No
4500F000	22000	8800	9000	9450	No
5000D000	800	970	910	840	Yes
5500D000	7800	4550	4150	-	-
6500F500L	7800	3050	3850	4000	No
6500F500M	7800	3800	3050	3050	No
6500F500U	7800	*	*	*	-
6500F625	7800	3350	3400	3630	-
Melody	^	800	970	1650	-
7500F000	7800	6400	6350	6500	No

* Dry/insufficient water to sample

** Bore appeared to be blocked

*** New site - results may not be representative of groundwater conditions at time of sampling due to ongoing well development

^ indicated no trigger limit identified

An investigation is triggered when EC values recorded exceed the beneficial use quality range (as described in the GWMP) for three successive monitoring rounds. Results outside this range are shown in **bold**.

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).

EC trigger limits in May 2020 were reached at groundwater bore 5000D000 which has been above the limit for three consecutive monitoring events. An investigation has been initiated

regarding this in accordance with the MPO Groundwater Management Plan (MACH Energy, 2019). The next quarterly monitoring event is scheduled for November 2020.

9. Noise Monitoring

Attended noise monitoring was undertaken during the night period of 10 August 2020 at 6 monitoring locations as per the MPO Noise Management Plan (MACH Energy, 2019) in accordance with DA 92/97 and EPL 20850.

9.1 Results

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

Table 9-1 – $L_{A1,1min}$ Generated by MPO: Attended Night Monitoring – 10 August 2020

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies ¹	MPO Only $L_{A1,1min}$ dB ^{2,4}	Exceedance dB ^{3,4}
N-AT1	10/08/20 23:48	2.0	D	45	Yes	IA	Nil
N-AT2	10/08/20 22:00	2.1	D	45	Yes	39	Nil
N-AT3	10/08/20 23:22	1.9	G	45	No	44	NA
N-AT4	10/08/20 00:20	2.2	D	45	Yes	IA	Nil
N-AT5	10/08/20 23:53	2.0	D	45	Yes	IA	Nil
N-AT6	10/08/20 22:37	2.3	D	45	Yes	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 $L_{A1,1minute}$ attributed to MPO;
- NA in exceedance column means meteorological conditions outside those specified in Condition L2.3 of EPL 20850 and thus criterion is not applicable; and
- Bold results indicate exceedance of criteria.

Table 9-2 – $L_{Aeq,15min}$ Generated by MPO: Attended Night Monitoring – 10 August 2020

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies ¹	MPO Only L_{Aeq} dB ^{2,4}	Exceedance dB ^{3,4}
N-AT1	10/08/20 23:48	2.0	D	43	Yes	IA	Nil
N-AT2	10/08/20 22:00	2.1	D	36	Yes	30	Nil
N-AT3	10/08/20 23:22	1.9	G	41	No	37	NA
N-AT4	10/08/20 00:20	2.2	D	42	Yes	IA	Nil

N-AT5	10/08/20 23:53	2.0	D	40	Yes	IA	Nil
N-AT6	10/08/20 22:37	2.3	D	35	Yes	IA	Nil

Notes:

1. 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 $L_{Aeq,15minute}$ 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 – $L_{Aeq,period}$ Cumulative Noise: Attended Night Monitoring – 10 August 2020

Location	Start Date and Time	Cumulative Noise Criterion L_{Aeq} dB	Measured Mining Only $L_{Aeq,period}$ dB ^{1,2}	Exceedance dB
N-AT1	10/08/20 23:48	40	Nil	Nil
N-AT2	10/08/20 22:00	40	Nil	Nil
N-AT3	10/08/20 23:22	40	Nil	Nil
N-AT3	10/08/20 00:20	40	Nil	Nil
N-AT4	10/08/20 23:53	40	Nil	Nil
N-AT5	10/08/20 22:37	40	Nil	Nil
N-AT6	10/08/20 23:48	40	Nil	Nil

Notes:

1. 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 other source of mining is audible, or if MPO is inaudible, the measured cumulative noise defined here is ‘Nil’.

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 MPO Noise Management Plan (MACH Energy, 2019). Noise levels from MPO complied with noise limits at all monitoring locations during the August 2020 monitoring period, with the exception of noise samples taken from N-AT3. These elevated measurements are part of an ongoing investigation.

10. Blast Monitoring

There were 5 blast events during August (a total of 49 blasts YTD). Results for August 2020 are presented in **Table 10-1**. All blast results during the August 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 – August 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	Blast Fume Compliant
Thursday 6/08/2020	13:12	0.830	101	0.460	90.5	0.890	104.2	Y
Thursday 13/08/2020	15:08	0.460	102.7	0.260	95.7	0.300	104	Y
Tuesday 18/08/2020	10:20	1.280	111	0.400	102.6	0.600	108.5	Y
Friday 21/08/2020	09:30	0.230	101.4	0.250	100.3	0.360	101.7	Y
Wednesday 26/08/2020	13:12	0.620	103	0.320	95.3	0.960	105.2	Y