

**Mount Pleasant Operation
Monthly Environmental Monitoring Report**

February 2023

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 February 2023
Reporting Period End Date	28 February 2023
Date All Data Received	12 April 2023

Links to two key regulatory documents are provided here:

- [MACH Energy Environment Protection Licence EPL 20850; and](#)
- [Mount Pleasant Operation Development Application Approval DA 92/97.](#)

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 locations and Noise Assessment Groups (NAGs);
- **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.

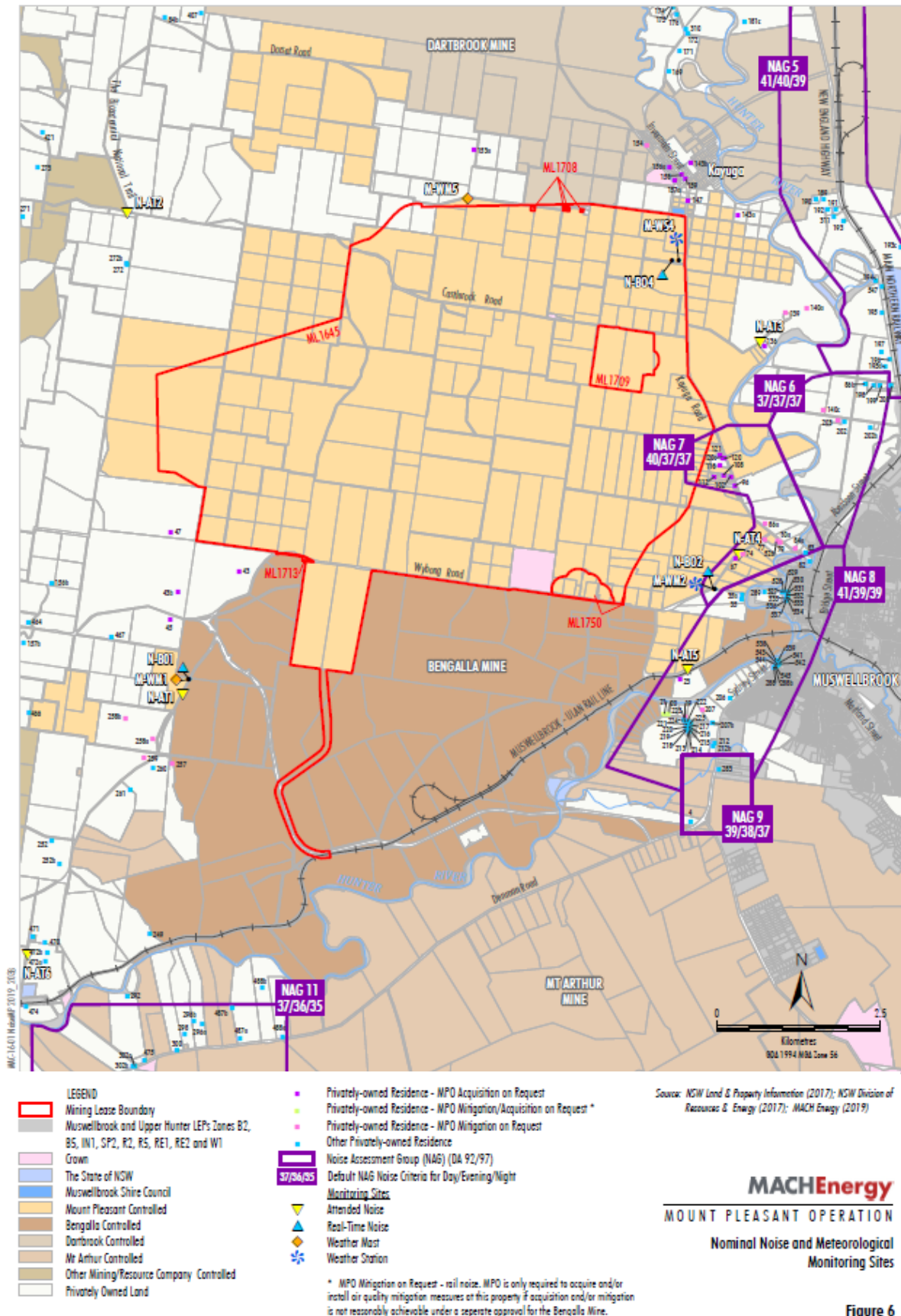


Figure 6

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

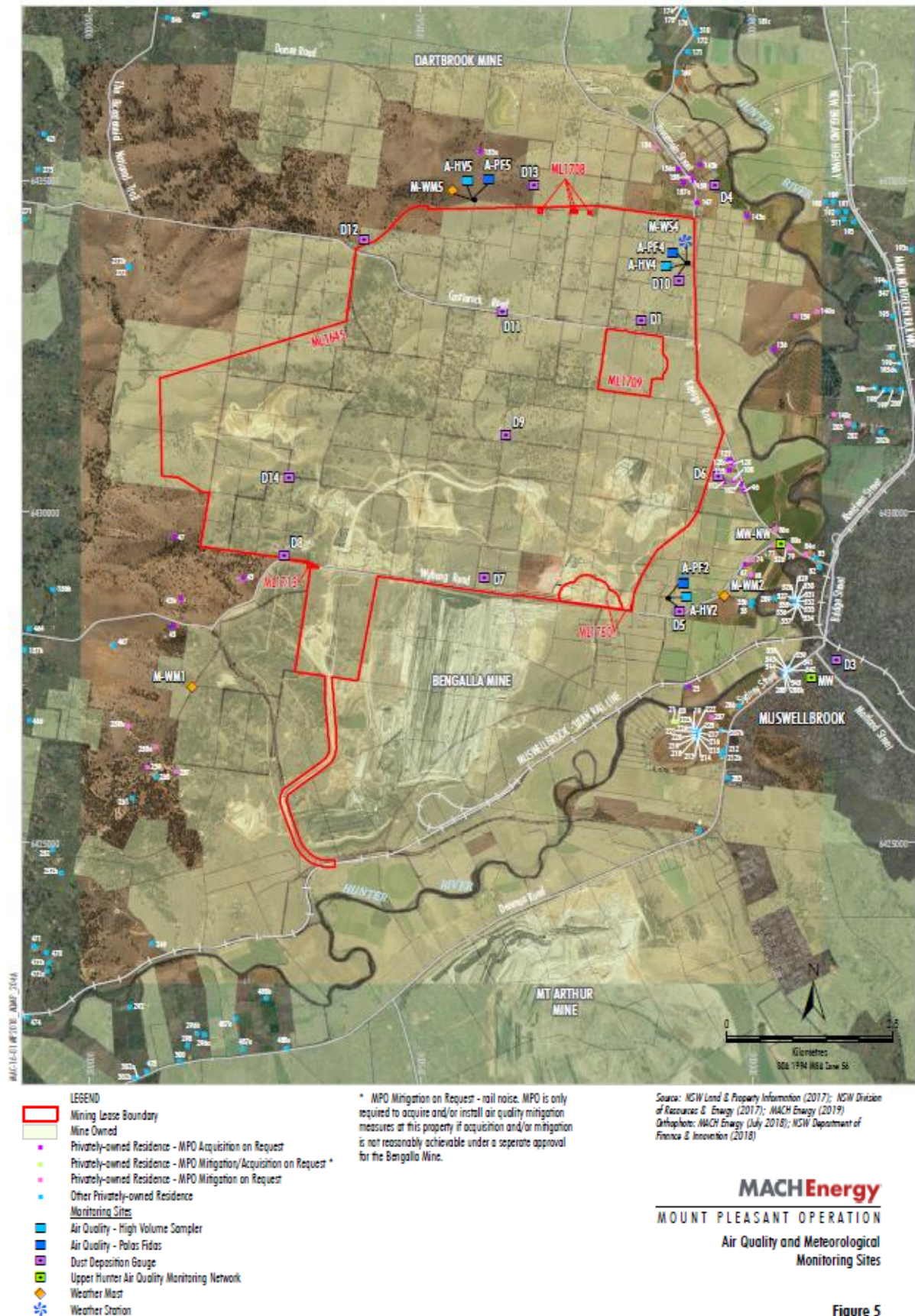
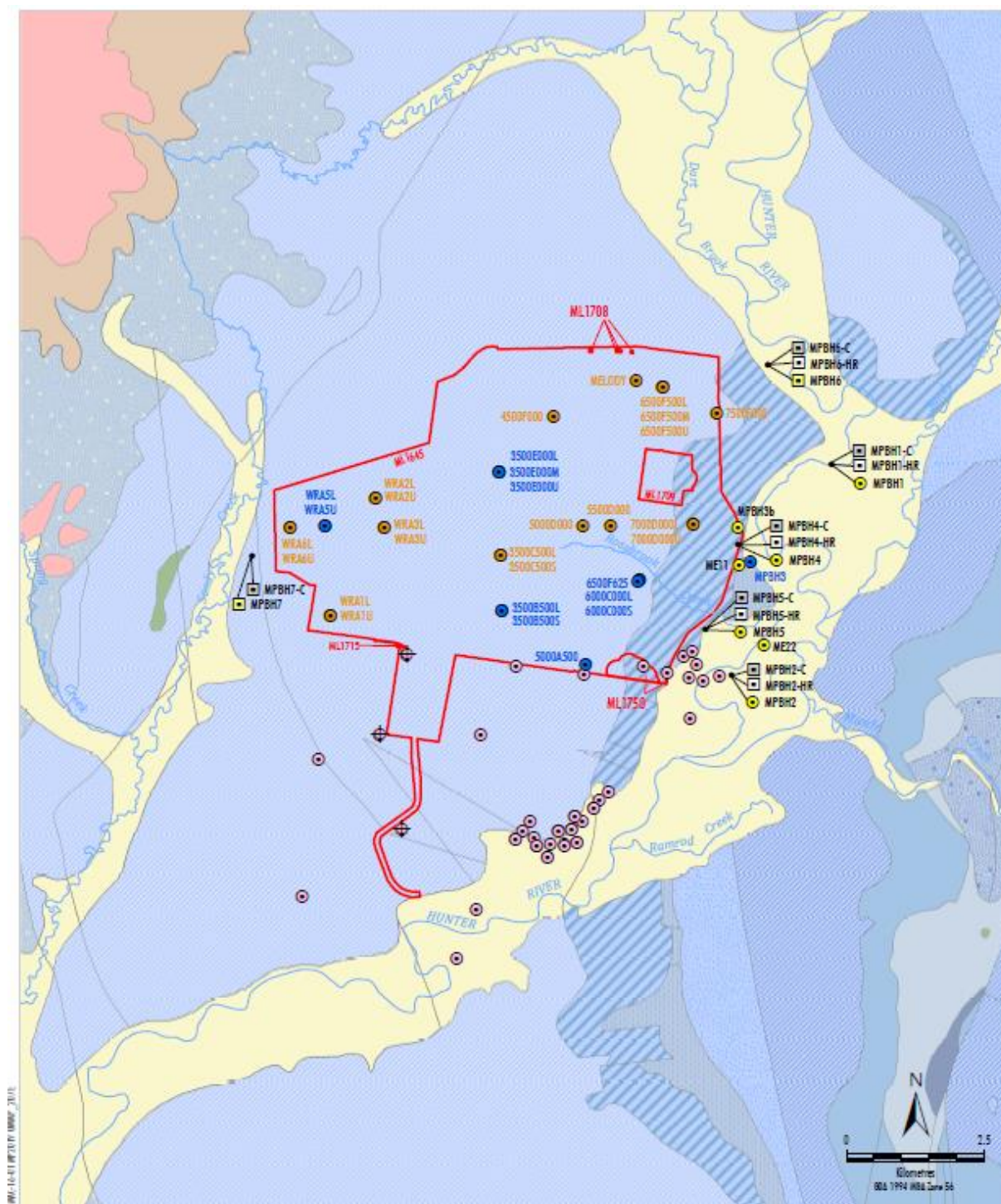


Figure 5

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



- LEGEND**
- Mining Lease Boundary
 - Mount Pleasant Monitoring
 - Standpipe
 - Standpipe - Alluvium
 - Standpipe - Historical
 - Planned Mount Pleasant Monitoring
 - Standpipe - Coal Seam
 - Standpipe - Interburden
 - Standpipe - Alluvium
 - Bengalla Monitoring
 - 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

MACHEnergy
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 (PM₁₀ and PM_{2.5}), the weather stations measure wind speed and direction, temperature (at 2 metres (m) and 10m), temperature inversion (using the sigma theta method), solar radiation, relative humidity, rainfall and atmospheric pressure.

The majority of meteorological data was captured at M-WS2 (>99.9%) during February 2023 (the monitoring period), with the exception of solar radiation parameters (94.1%). The majority of data for this meteorological parameter was captured at M-WS4 (94.5%) during the monitoring period.

Throughout February 2023, there was 60.6mm and 49.8mm 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 gauges commenced on 16 January 2023. Sample collection was undertaken on 17 February 2023 by AECOM with sample analysis performed by ALS, a National Accreditation and Testing Authority (NATA) accredited laboratory. Results are summarised in **Table 4-1**. Annual rolling averages for February 2023 have been provided as an indication of performance between February 2022 – February 2023 and does not represent annual average results for 2023 as per Schedule 3, Condition 20 of DA 92/97.

Table 4-1: Dust Depositional Results – February 2023

Location	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
D1	1.8	2.0
D3*	-	-
D4	1.9	1.0
D5a	1.9	1.9
D6	2.3	1.7
D7b	6.8	6.5
D8	3.2	2.9
D9a	4.8	2.6
D10	1.5	1.0
D11	2.1	1.7
D12	1.4	0.7
D13	2.0	1.2
D14	4.9	3.0
<i>Criterion</i>	-	4

Notes:

Results in **bold** indicate an elevated measurement of adopted assessment criteria

* not in service.

Contaminated results, as described in Section 4.1, are not included in the 12-month rolling average. Site D7b is located within close proximity to the northern boundary of a neighbouring mining operation and thus can be influenced by this site. D7b 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 February sampling event noted that all the gauges contained insects. There was insufficient evidence of contamination in all depositional dust gauges to justify any being deemed contaminated. All February 2023 insoluble solid results were included in the annual rolling average calculations. **Figure 4-1** compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.

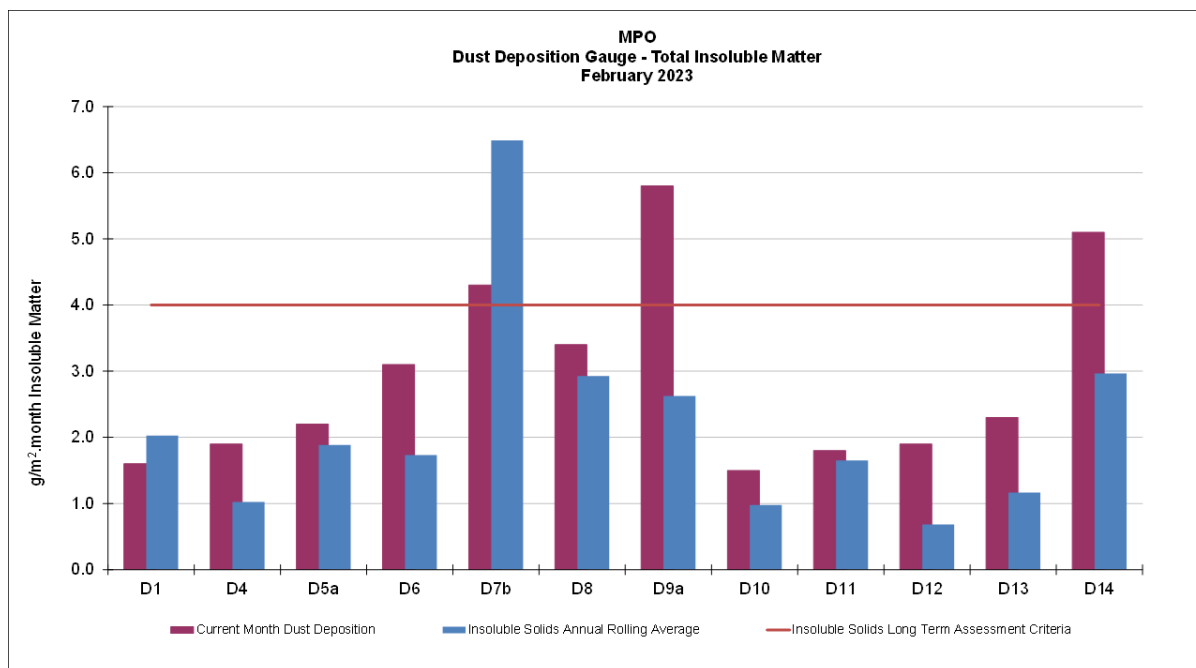


Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – February 2023

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 February 2023, sample collection was undertaken by AECOM with sample analysis performed by ALS, a NATA accredited laboratory. TSP results for the monitoring period are provided in **Table 5-2**. Annual rolling averages for February 2023 have been provided as an

indication of performance between February 2022 – February 2023 and do not represent annual average results for 2023 as per Schedule 3, Condition 20 of DA 92/97.

Table 5-2 Total Suspended Particulate Monitoring Data – February 2023

Run Date	Assessment Criterion	TSP $\mu\text{g}/\text{m}^3$		
		HVAS A-PF2	HVAS M-WS4	HVAS A-PF5
4/02/2023	-	141 ¹	57.4 ¹	25.7
10/02/2023	-	43.0	34.9	32.2
16/02/2023	-	63.3	85.6	69.9
22/02/2023	-	28.9	60.7	34.3
28/02/2023	-	51.1	60.7	35.7
Monthly Mean	-	65.5	59.9	39.6
Annual Rolling Average	90	40	33	27

Notes:

Results in **bold** indicate an elevated reading

1 Sample collected 8/02/2023 due to technical issues with sampler on run date

5.3 Discussion

For the reporting period, the annual rolling average TSP data at all sites was below the annual average criterion of 90 $\mu\text{g}/\text{m}^3$.

6. Real Time Air Quality Monitoring

Continuous particulate matter less than 10 μm (PM_{10}) and particulate matter less than 2.5 μm ($\text{PM}_{2.5}$) monitoring was conducted by three Palas Fidas units (one utilised for management only) at MPO during February 2023.

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 $\text{PM}_{2.5}$ 12-month rolling averages for February 2023 have been provided in Section 6.2 and 6.4 respectively, as an indication of performance during 2023 as per Schedule 3, Condition 20 of DA 92/97.

6.1 PM_{10} Results – 24 Hour Rolling Average

In accordance with the DA 92/97 limit of 50 $\mu\text{g}/\text{m}^3$ for the 24 hour rolling average, there were no elevated readings in February 2023. Real time PM_{10} 24 hour rolling average results for February 2023 are presented in **Table 6-1**.

Table 6-1: MPO Palas Fidas PM₁₀ Data – February 2023

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					
1/02/2023	16	11	14	17	44	50
2/02/2023	26	10	15	18.7	44	50
3/02/2023	30	10	12	31.3	44	50
4/02/2023	26	8	9	26.2	44	50
5/02/2023	27	14	25	25.8	44	50
6/02/2023	21	15	28	29.2	44	50
7/02/2023	17	12	17	17.4	44	50
8/02/2023	15	11	17	15	44	50
9/02/2023	15	11	17	12.1	44	50
10/02/2023	16	12	18	14	44	50
11/02/2023	19	10	13	16.4	44	50
12/02/2023	26	14	19	31	44	50
13/02/2023	27	16	22	24.8	44	50
14/02/2023	17	11	16	15.5	44	50
15/02/2023	15	11	21	16.6	44	50
16/02/2023	18	15	31	22	44	50
17/02/2023	22	17	-	27.1	44	50
18/02/2023	23	16	-	25.7	44	50
19/02/2023	24	14	-	22.9	44	50
20/02/2023	25	15	-	18.7	44	50
21/02/2023	21	15	-	21.6	44	50
22/02/2023	11	9	13	6.3	44	50
23/02/2023	16	12	14	13.1	44	50
24/02/2023	14	11	15	12.2	44	50
25/02/2023	13	13	20	14.5	44	50
26/02/2023	14	12	-	14.4	44	50
27/02/2023	17	11	-	19	44	50
28/02/2023	23	16	-	19	44	50

Notes:

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 February 2023.

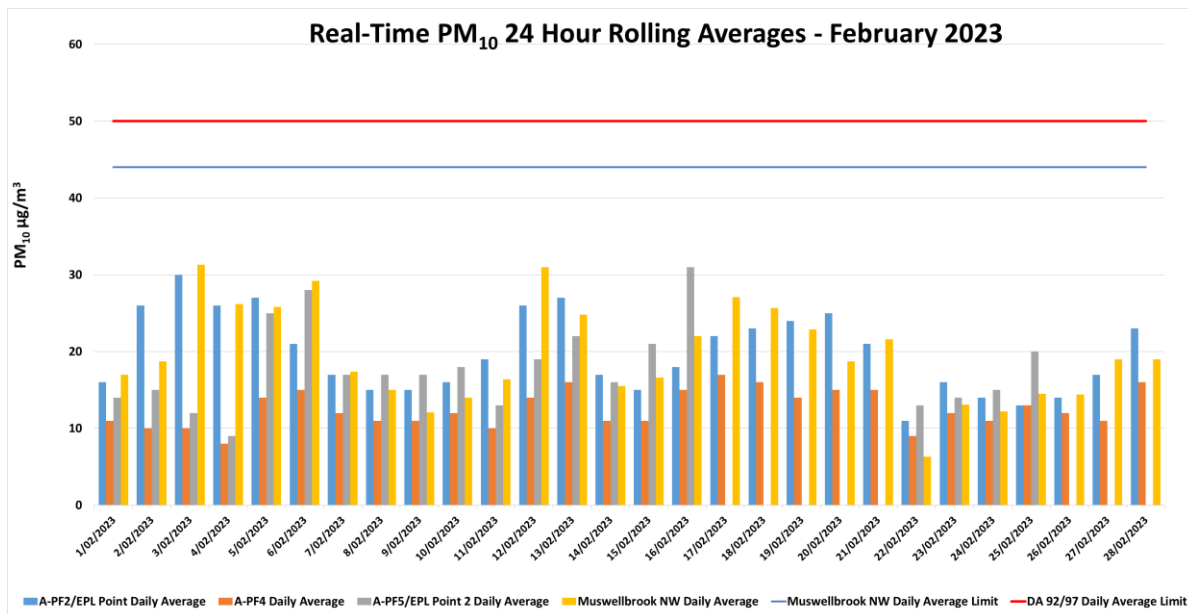


Figure 6-1: Real-time PM₁₀ 24 Rolling Average Results for February 2023.

6.2 PM₁₀ Results – Annual Rolling Average

There were no exceedance of the PM₁₀ annual rolling average reported at MPO during February 2023. Real time PM₁₀ annual rolling averages during the reporting period are presented in **Figure 6-2** below.

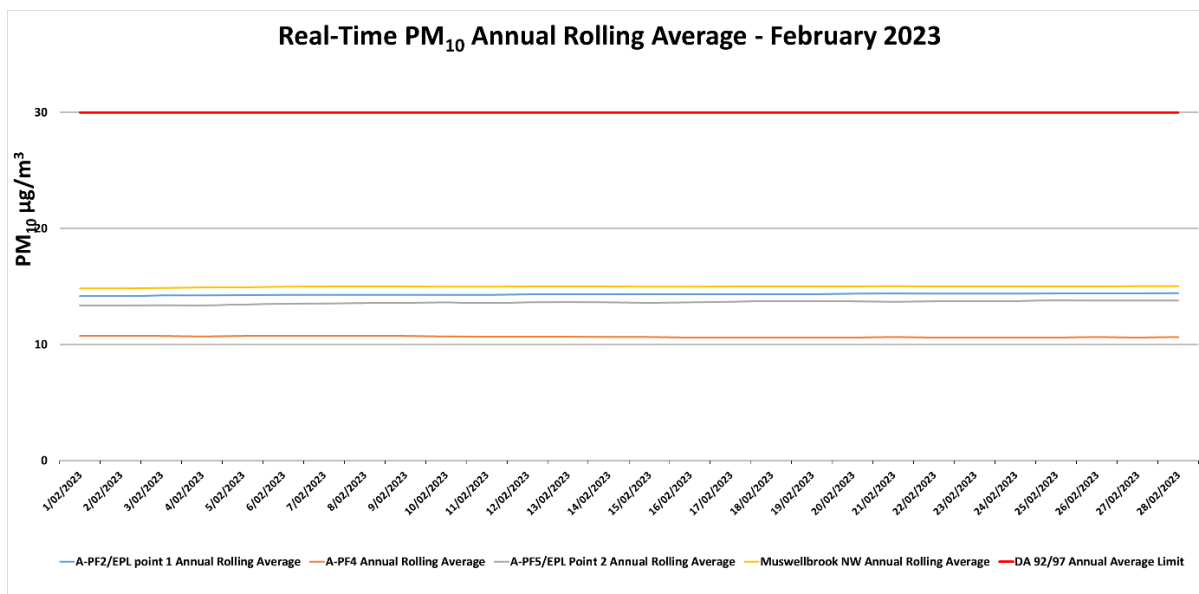


Figure 6-2: Real-time PM₁₀ Annual Rolling Average Results for February 2023.

6.3 PM_{2.5} Results – 24 Hour Rolling Average

There was no exceedance of the PM_{2.5} annual rolling average reported at MPO during February 2023. Real time PM_{2.5} 24 hour rolling average results for February 2023 are presented in **Table 6-2**.

Table 6-2: MPO Palas Fidas PM_{2.5} Data – February 2023

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			
1/02/2023	6	4	5	25
2/02/2023	7	4	5	25
3/02/2023	5	4	4	25
4/02/2023	5	3	3	25
5/02/2023	5	4	5	25
6/02/2023	6	5	6	25
7/02/2023	7	5	6	25
8/02/2023	6	5	6	25
9/02/2023	7	5	6	25
10/02/2023	6	5	6	25
11/02/2023	6	5	5	25
12/02/2023	8	6	6	25
13/02/2023	11	7	9	25
14/02/2023	7	5	6	25
15/02/2023	5	4	6	25
16/02/2023	5	4	6	25
17/02/2023	6	5	-	25
18/02/2023	7	5	-	25
19/02/2023	10	6	-	25
20/02/2023	11	7	-	25
21/02/2023	8	6	-	25
22/02/2023	4	3	4	25
23/02/2023	6	5	5	25
24/02/2023	5	4	5	25
25/02/2023	4	4	5	25
26/02/2023	4	4	-	25
27/02/2023	5	4	-	25
28/02/2023	9	6	-	25

Notes:

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 February 2023 are presented in **Figure 6-3** below.

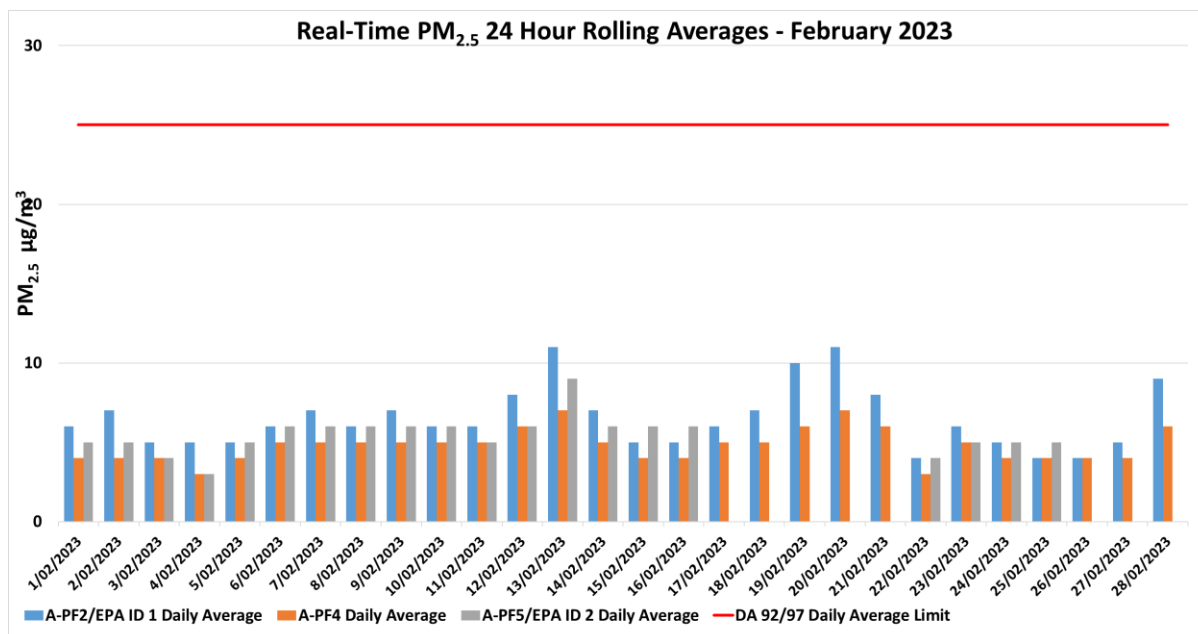


Figure 6-3: Real-time PM_{2.5} 24 hour Rolling Average Results for February 2023.

6.4 PM_{2.5} Results - Annual Rolling Average

There was no exceedance of the PM_{2.5} annual rolling average reported at MPO during February 2023. Real time PM_{2.5} annual rolling averages during the reporting period are presented in **Figure 6-4** below.

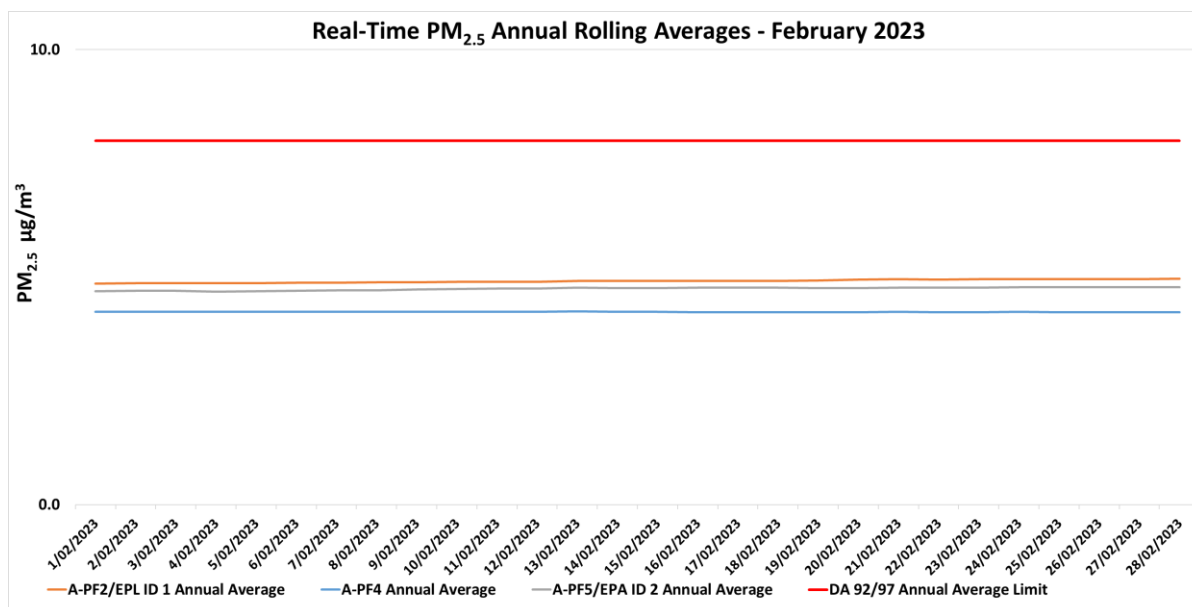


Figure 6-4: Real-time PM_{2.5} Annual Rolling Average Results for February 2023.

7. Surface Water Monitoring

7.1 Methodology

Surface water quality is monitored at 14 sites on a monthly basis, with additional monitoring conducted if triggered by a rain event. A more 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, 2022) 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

Surface water event monitoring was conducted by AECOM on 9 February 2023. Additional rain event monitoring occurred on 23 February 2023. Laboratory analysis was performed by ALS NATA accredited laboratory. Monthly monitoring results for pH, EC, TSS and Total Dissolved Solids (TDS) are presented in **Table 7-1**.

Table 7-1 – MPO Monthly Surface Water Monitoring Results – 9 February 2023

Station	pH	Electrical Conductivity (EC) (µs/cm) ¹	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (TSS) (mg/L)
W1	8.1	590	312	17
W2	^	^	^	^
W3	8.1	720	404	17
W4	7.8	2400	1520	32
W5	*	*	*	*
W6A	8.1	660	517	12
W9	*	*	*	*
W11	8.1	3250	2010	6
W12	8.0	4250	2060	11
W13	8.4	4200	2060	14
W14	*	*	*	*
W15	8.1	790	444	16
W16	8.4	8700	5000	12
W17	^	^	^	^

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

*Dry or insufficient water to sample.

^ Unsafe access

¹ Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI2 (EC).

Table 7-2 – MPO Rain Event Surface Water Monitoring Results – 23 February 2023

Station	pH	Electrical Conductivity (EC) (µs/cm) ¹	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (TSS) (mg/L)
W1	8.2	680	412	9
W2	8.2	800	432	10
W3	8.2	870	445	17
W4	7.8	1800	1060	14
W5	*	*	*	*
W6A	8.3	780	458	14
W9	*	*	*	*
W11	8.1	3300	1770	<5
W12	8.1	4700	2580	<5
W13	8.4	4050	2000	7
W14	*	*	*	*
W15	8.1	1000	545	23
W16	8.3	9400	5290	18
W17	^	^	^	^

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

*Dry or insufficient water to sample.

^ Unsafe access

¹ Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI2 (EC).

During the 9 February monitoring event, three (3) sites were dry or contained insufficient water to sample with site W2 and W17 unsafe to access. All sites were within there respective pH and TSS trigger levels. Site 6A exceeded their EC trigger values.

During the 23 February monitoring event, three (3) sites were dry or contained insufficient water to sample with site W17 unsafe to access. All sites were within there respective pH and TSS trigger levels. Sites W2 and W6A exceeded there respective EC trigger limits.

An investigation is triggered if elevated measurements occur for three consecutive sampling events in accordance MPO Water Management Plan (MACH Energy, 2022).

8. Groundwater Monitoring

Quarterly groundwater monitoring was conducted between 20 and 28 of February 2023. 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		Nov 2022 Water Level (DTW)	Aug 2022 Water Level (DTW)	May 2022 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
WRA1L	-	>± 0.5m	0.00	0.00	0.00	
WRA1U	-	>± 0.5m	3.47	2.80	5.41	
WRA6L	-	>± 0.5m	1.10	0.60	0.63	
WRA6U	-	>± 0.5m	1.83	1.20	1.57	
MPBH1	9.71	10.70	9.96	8.39	8.89	No
MPBH2	12.20	14.20	10.85	10.70	11.19	No
MPBH3b	12.00	Dry (or 14.0m)	11.21	10.25	11.10	No
MPBH4	-	>± 0.5m	11.26	10.32	11.08	
MPBH5	-	>± 0.5m	*	*	*	
MPBH1-C	-	>± 0.5m	10.06	8.55	9.03	
MPBH1-HR	-	>± 0.5m	29.61	34.75	44.31	
MPBH2-C	-	>± 0.5m	11.12	11.00	11.50	
MPBH2-HR	-	>± 0.5m	11.07	11.18	11.89	
MPBH4-C	-	>± 0.5m	10.74	9.92	10.64	
MPBH4-HR	-	>± 0.5m	50.54	50.65	50.76	
MPBH5-C	-	>± 0.5m	10.34	10.50	11.10	
MPBH5-HR	-	>± 0.5m	10.43	10.48	11.89	
MPBH6	-	>± 0.5m	9.30	8.25	9.37	
MPBH6-C	-	>± 0.5m	10.91	10.44	10.97	
MPBH6-HR	-	>± 0.5m	10.62	9.54	10.61	
MPBH7	-	>± 0.5m	5.14	2.64	4.63	
MPBH7-C	-	>± 0.5m	13.15	10.47	12.13	
3500C500L	-	>± 0.5m	17.13	17.79	19.30	
3500C500S	-	>± 0.5m	19.86	17.39	18.88	
4500F000	-	>± 0.5m	22.73	23.84	26.12	
5000D000	-	>± 0.5m	120.72	115.23	114.95	
5000D000-R**	-	>± 0.5m	137.38	137.10	137.41	
5500D000	-	>± 0.5m	37.18	37.09	37.83	
6500F500L	-	>± 0.5m	52.78	52.86	53.33	
6500F500M	-	>± 0.5m	52.98	53.06	54.00	
6500F500U	-	>± 0.5m	30.32	30.38	32.36	
6500F625	-	>± 0.5m	13.34	12.14	^	
Melody	-	>± 0.5m	10.83	8.53	^	
7500F000	-	>± 0.5m	35.34	35.75	36.61	

* Dry/insufficient water to sample

** New site

^ Unsafe access

Table 8-2 - MPO Quarterly Groundwater pH Results

Monitoring Location/ ID	pH Trigger Range		Nov 2022 pH	Aug 2022 pH	May 2022 pH	Triggered (Yes/No)
	Lower	Upper				
WRA1I	6.0	8.5	7.1	7.1	7.2	No
WRA1U			7.2	7.2	7.1	-
WRA6L			6.9	7.1	7.0	No
WRA6U			6.9	6.9	7.0	No
MPBH1			6.9	7.0	7.0	No
MPBH2			6.8	6.9	6.9	No
MPBH3b			7.5	7.1	7.4	No
MPBH4			7.0	7.0	7.1	No
MPBH5			*	*	*	-
MPBH1-C			8.7	8.7	8.5	No
MPBH1-HR			7.7	7.8	7.8	No
MPBH2-C			11.3	11.2	11.2	No
MPBH2-HR			8.1	8.3	8.4	No
MPBH4-C			8.0	7.8	7.9	No
MPBH4-HR			7.3	7.4	7.3	No
MPBH5-C			9.6	10.3	9.8	Yes
MPBH5-HR			7.5	7.5	7.5	No
MPBH6			7.1	7.1	7.1	No
MPBH6-C			7.8	7.8	7.4	No
MPBH6-HR			7.1	7.4	7.4	No
MPBH7			6.8	7.2	7.0	No
MPBH7-C			7.4	7.3	7.0	No
3500C500L			7.6	7.6	7.5	No
3500C500S			7.3	7.2	7.3	No
4500F000			6.9	6.9	6.8	No
5000D000-R**			7.7	7.9	7.7	-
5500D000			7.1	7.0	6.9	No
6500F500L			7.3	7.2	7.2	No
6500F500M			7.5	7.3	7.2	No
6500F500U			6.9	6.8	6.6	-
6500F625			7.2	7.0	^	-
Melody			7.2	7.0	^	-
7500F000			7.7	7.7	7.9	No

* Dry/insufficient water to sample

^ Unsafe Access

** 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

Table 8-3 - MPO Quarterly Groundwater EC Results

Monitoring Location/ ID	Maximum Beneficial Use Trigger	Nov 2022 EC ¹	Aug 2022 EC ¹	May 2022 EC ¹	Triggered (Yes/No)
WRA1L	7800	3250	2900	2650	No
WRA1U	-	3600	3250	900	
WRA6L	7800	6000	6150	7200	No
WRA6U	22000	8050	8350	8150	No
MPBH1	800	700	620	700	No
MPBH2	930	1050	870	910	No
MPBH3b	7800	5700	7200	6500	No
MPBH4	-	5750	5500	5700	
MPBH5	-	*	*	*	
MPBH1-C	-	1550	1550	1250	
MPBH1-HR	-	1800	2000	1750	
MPBH2-C	-	1850	2150	1950	
MPBH2-HR	-	1700	1800	1750	
MPBH4-C	-	4550	4500	4400	
MPBH4-HR	-	5600	5700	5750	
MPBH5-C	-	720	620	680	
MPBH5-HR	-	900	890	880	
MPBH6	-	1300	1000	1050	
MPBH6-C	-	7100	6700	3250	
MPBH6-HR	-	1800	5200	5150	
MPBH7	-	11000	9950	11200	
MPBH7-C	-	10800	10900	10300	
3500C500L	7800	4100	3850	3600	No
3500C500S	7800	4200	4500	3450	No
4500F000	22000	8600	8450	7950	No
5000D000-R**	-	4450	4250	4250	
5500D000	7800	4500	4300	4250	No
6500F500L	7800	3000	2950	3000	No
6500F500M	7800	3400	3100	3000	No
6500F500U	7800	5350	4750	4750	
6500F625	7800	3450	4150	^	No
Melody	-	2900	2850	^	
7500F000	7800	6350	6450	6500	No

* Dry/insufficient water to sample

^ Unsafe access

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

- Indicates no trigger limit identified

¹ Results have been rounded in accordance with the In-house method Q4AN(EV)-332-WI2 (EC).

During February 2023 monitoring event, Site MPBH5 contained insufficient water to sample and nineteen (19) sites had changes in standing water level of greater than $\pm 0.5\text{m}$ from the previous measurement. All monitoring locations were within the pH trigger limits except sites MPBH2-C and MPBH5-C. All monitoring locations were below their respective EC trigger limits except site MPBH2 which was exceeded its limit.

An investigation is triggered if elevated measurements occur for three consecutive sampling events in accordance MPO Water Management Plan (MACH Energy, 2022). The next quarterly ground water monitoring event is scheduled for May 2023.

9. Noise Monitoring

Attended noise monitoring was undertaken during the night period of 6/7 February 2023 at six (6) monitoring locations as per the *MPO Noise Management Plan* (MACH Energy, 2021) 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 February 2023 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 – 6/7 February 2023

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
N-AT1	06/02/2023 23:41	3.4	D	45	No	IA	NA
N-AT2	06/02/2023 22:10	4.3	D	45	No	32	NA
N-AT3	06/02/2023 22:45	3.7	D	45	No	IA	NA
N-AT4	06/02/2023 23:40	3.4	D	45	No	IA	NA
N-AT5	06/02/2023 23:41	3.4	D	45	No	IA	NA
N-AT6	06/02/2023 23:41	3.4	D	45	No	IA	NA

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 $L_{A1,1minute}$ 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;
4. IA = inaudible; and
5. Bold results indicate exceedance of criteria.

Table 9-2 – $L_{Aeq,15min}$ Generated by MPO: Attended Night Monitoring – 6/7 February 2023

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies ¹	MPO Only L_{Aeq} dB ^{2,3}	Exceedance dB
N-AT1	06/02/2023 23:41	3.4	D	43	No	IA	NA
N-AT2	06/02/2023 22:10	4.3	D	36	No	26	NA
N-AT3	06/02/2023 22:45	3.7	D	41	No	IA	NA
N-AT4	06/02/2023 23:40	3.4	D	42	No	IA	NA
N-AT5	06/02/2023 23:41	3.4	D	40	No	IA	NA
N-AT6	06/02/2023 23:41	3.4	D	35	No	IA	NA

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. IA = inaudible; and
4. Bold results indicate exceedance of criteria.

Table 9-3 – $L_{Aeq,period}$ Cumulative Noise: Attended Night Monitoring – 6/7 February 2023

Location	Start Date and Time	Cumulative Noise Criterion L_{Aeq} dB	Measured Mining Only $L_{Aeq,period}$ dB ^{1,2,3}	Exceedance dB
N-AT1	06/02/2023 23:41	40	NA	NA
N-AT2	06/02/2023 22:10	40	NA	NA
N-AT3	06/02/2023 22:45	40	NA	NA
N-AT4	06/02/2023 23:40	40	NA	NA
N-AT5	06/02/2023 23:41	40	NA	NA
N-AT6	06/02/2023 23:41	40	NA	NA

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'.
3. NA in exceedance column means criterion was not applicable due to atmospheric conditions.

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, 2021). Noise levels from MPO complied with noise limits at all monitoring locations during the monitoring period.

10. Blast Monitoring

There were 6 blast events during February (a total of 13 blasts YTD). Results for February 2023 are presented in **Table 10-1**. All blast results during this monitoring period were below the criteria stated in Schedule 3, Condition 10 of DA 92/97 and L5 of EPL 20850.

Table 10-1 – MPO Blast Monitoring Results - February 2023

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 2/02/2023	15:53	0.620	101.7	0.540	99.5	0.680	104	Y
Thursday 9/02/2023	13:41	0.820	101.3	0.690	95.1	0.440	99.6	Y
Tuesday 14/02/2023	14:02	0.910	105	0.440	117.1	0.580	109.8	Y
Friday 17/02/2023	12:01	1.120	104.6	0.650	97.6	1.640	97.1	Y
Friday 21/02/2023	16:04	0.540	98.4	0.310	98.8	0.450	94.5	Y
Monday 24/02/2023	12:37	0.600	97.5	0.400	109.5	0.460	90.1	Y

END OF REPORT