

Mount Pleasant Operation Monthly Environmental Monitoring Report

May 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 May 2023
Reporting Period End Date	31 May 2023
Date All Data Received	11 July 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.

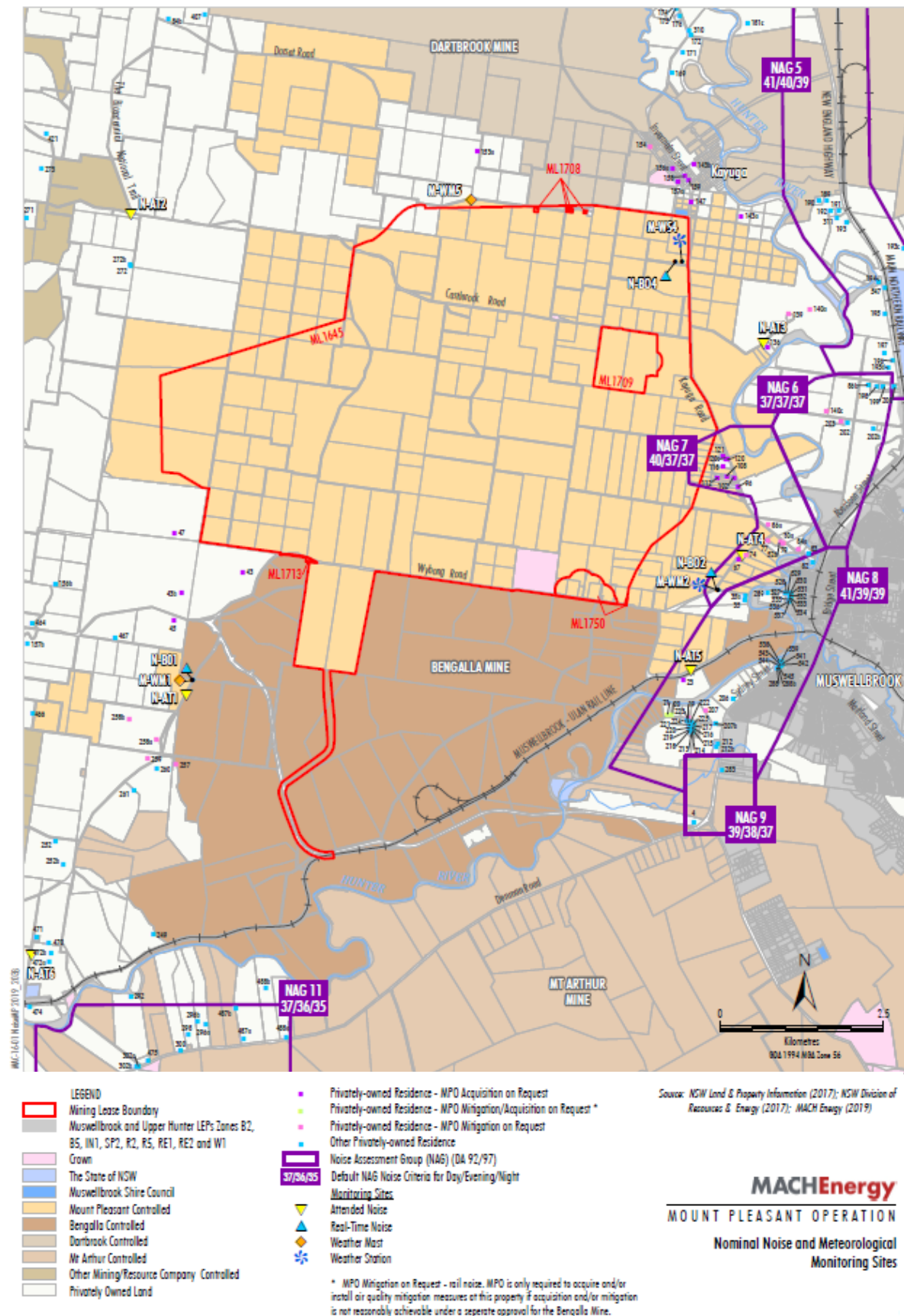


Figure 2-1 – MPO Attended Noise Monitoring Assessment Groups and Locations

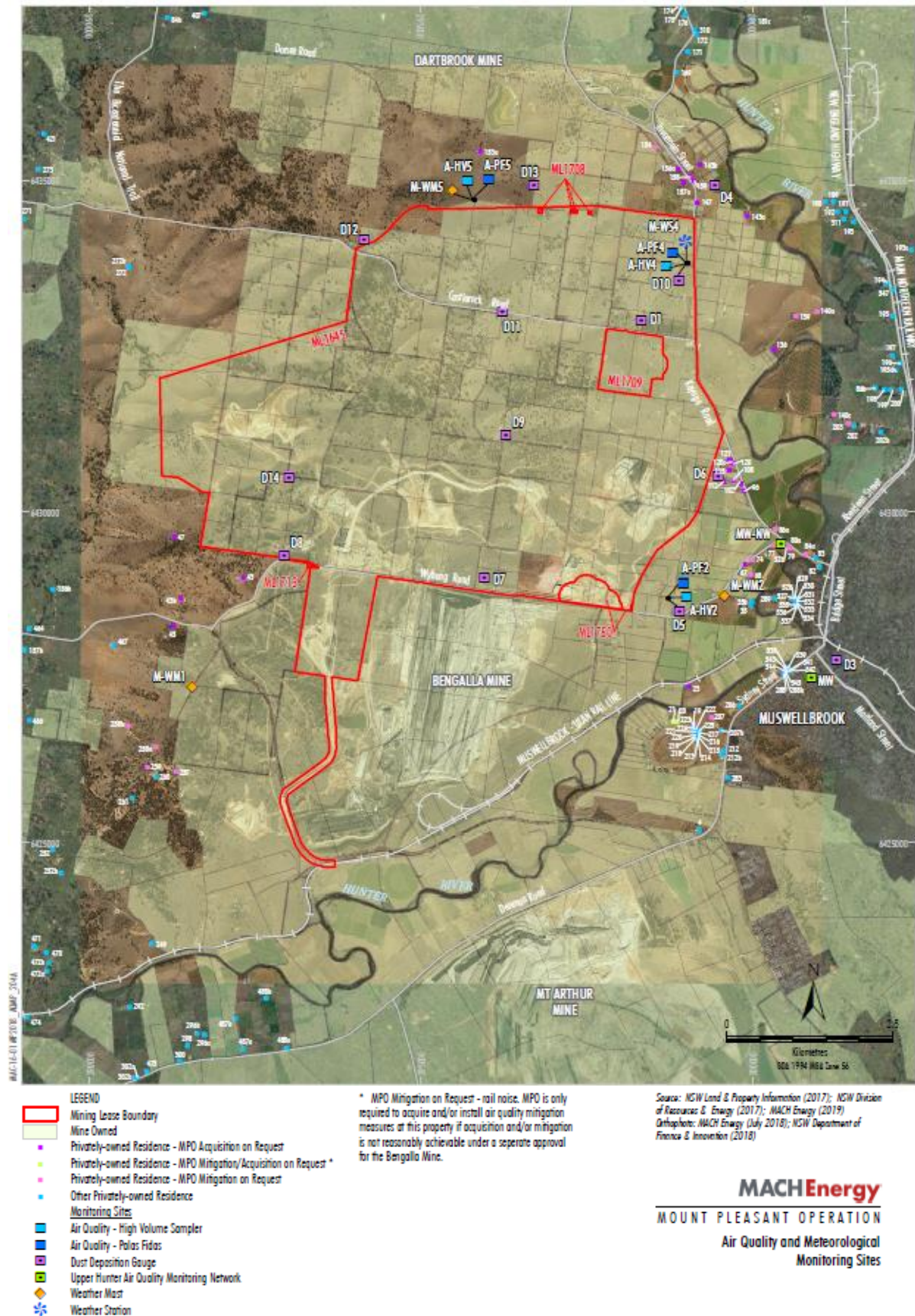
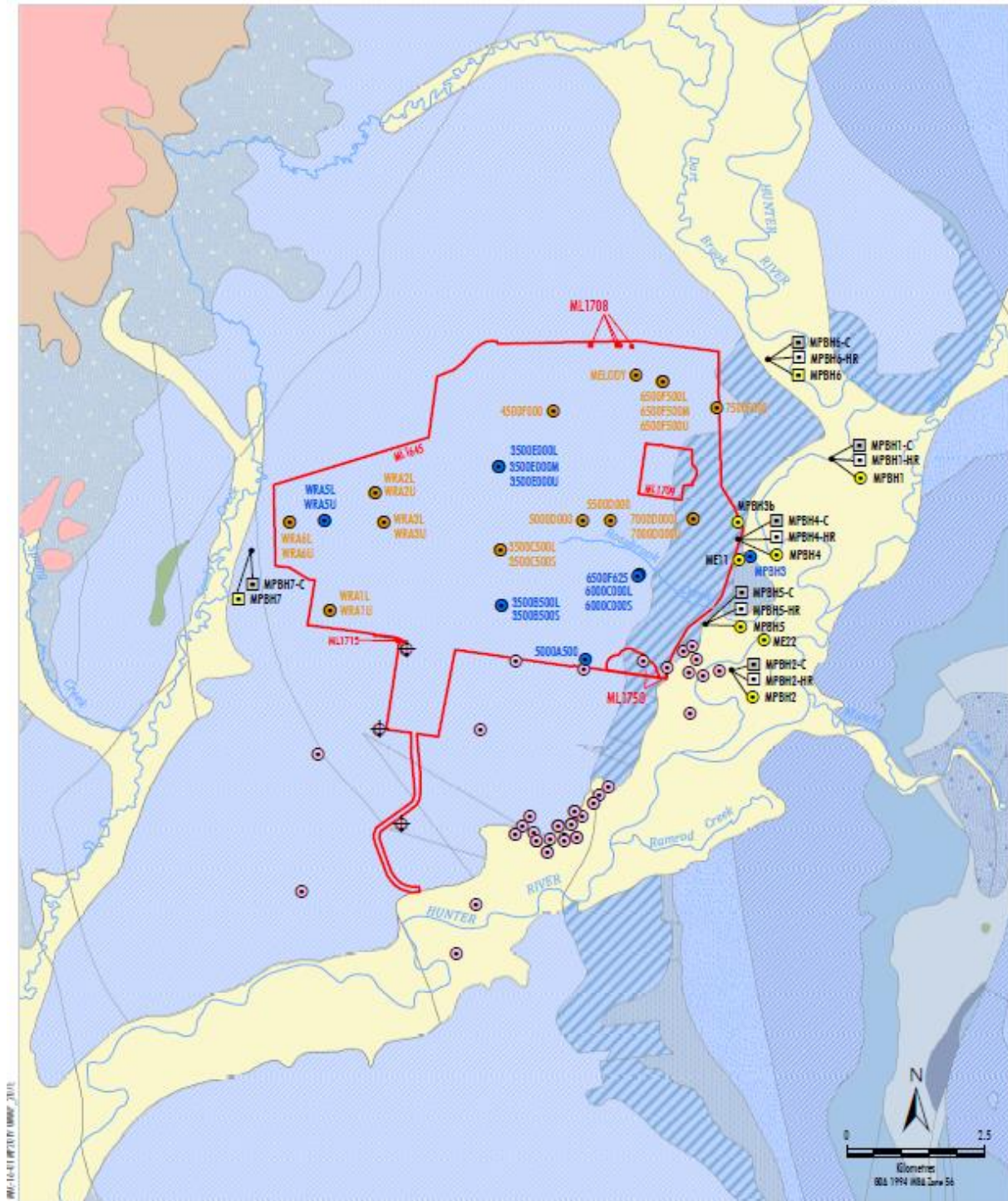


Figure 2-2 – MPO Air Quality and Meteorological Monitoring Network



- 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 2-4 – MPO Groundwater Monitoring Network

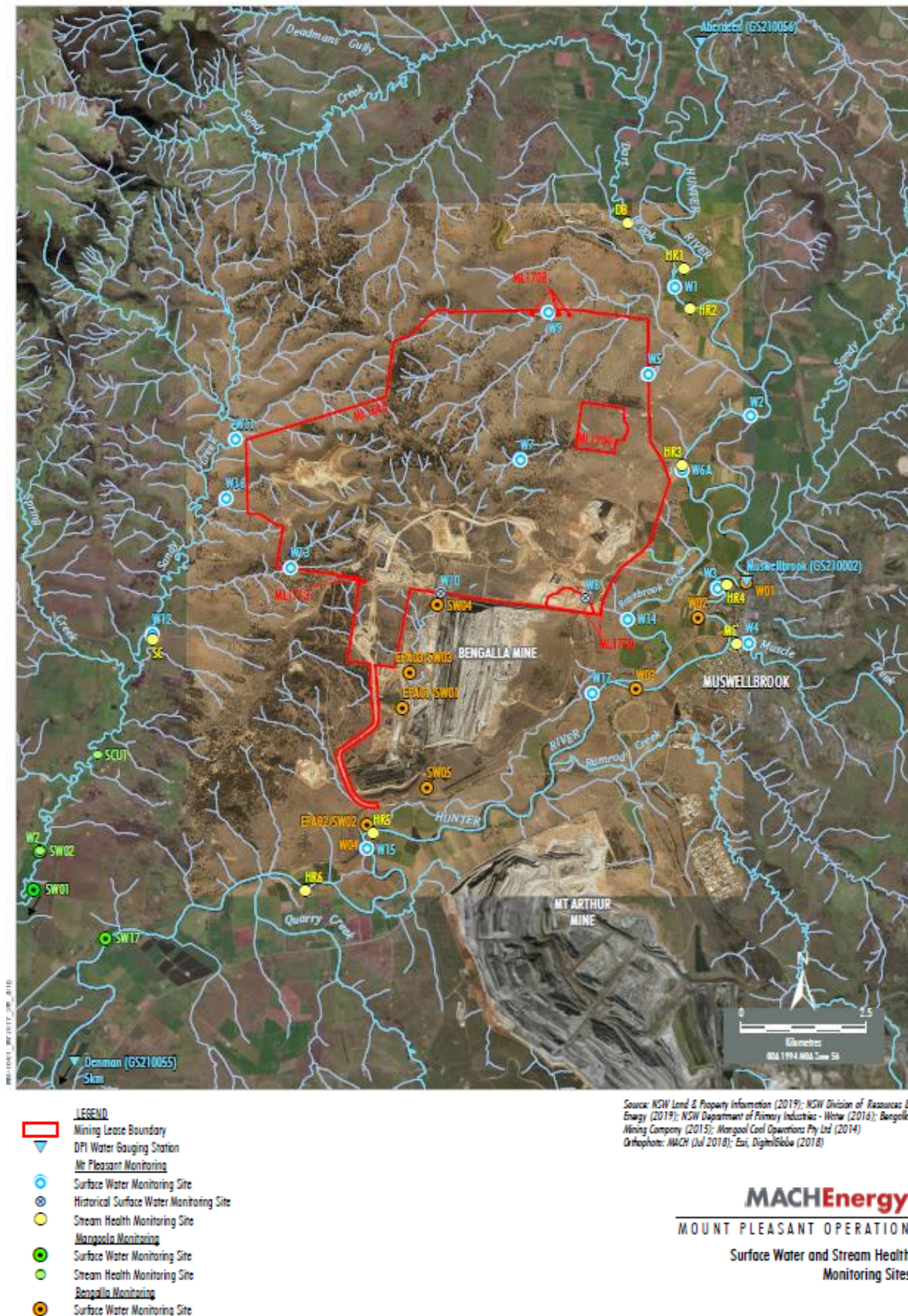


Figure 2-5 – MPO Surface Water Monitoring Network

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 (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 (>94.1%) during May 2023 (the monitoring period).

Throughout May 2023, there was 3mm and 0.8mm 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 21 April 2023. Sample collection was undertaken on 22 May 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 May 2023 have been provided as an indication of performance between May 2022 – May 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 – May 2023

Location	YTD Insoluble Solids (g/m ² .month)	Insoluble Solids Annual Rolling Average (g/m ² .month)
D1	1.9	2.0
D3*	2.1	*
D4	1.2	1.0
D5a	2.3	2.1
D6	2.0	1.8
D7b	8.4	6.8
D8	3.4	2.9
D9a	4.2	3.2
D10	1.1	0.9
D11	2.5	2.0
D12	1.2	0.7
D13	1.6	1.3
D14	4.4	3.0
<i>Criterion</i>	-	4

Notes:

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

* Insufficient monthly results to calculate annual average

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 May sampling event noted that all the gauges contained insects, three contained vegetation and one contained bird droppings. Field notes indicated that gauge D7b contents were brown in colour, slightly turbid and contained bird droppings resulting in the gauge being deemed to be contaminated. The insoluble solids result for site D7b was not included in the annual average calculation. All other May 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.

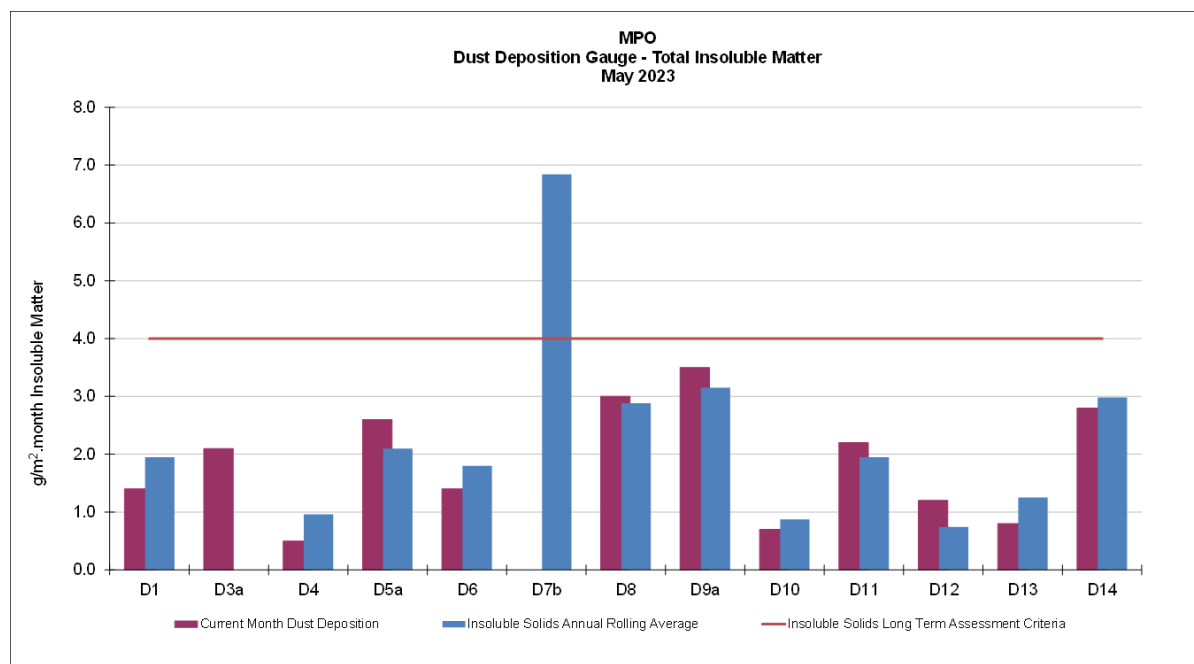


Figure 4-1: MPO Dust Deposition Monthly Results and Annual Rolling Average – May 2023

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 May 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 May 2023 have been provided as an indication of performance between May 2022 – May 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 – May 2023

Run Date	Assessment Criterion	TSP $\mu\text{g}/\text{m}^3$		
		HVAS A-PF2	HVAS M-WS4	HVAS A-PF5
5/05/2023	-	59.1	58.6	54.9
11/05/2023	-	27.8	61.8	27.9
17/05/2023	-	40.8	58.6	61.3
23/05/2023		97.3	63.5	53.2
29/05/2023		99.2	12.4	13.2
Monthly Mean	-	64.8	51.0	42.1
Annual Rolling Average	90	48	37	30

Notes:

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 $90 \mu\text{g}/\text{m}^3$.

6. Real Time Air Quality Monitoring

Continuous particulate matter less than $10 \mu\text{m}$ (PM_{10}) and particulate matter less than $2.5 \mu\text{m}$ ($\text{PM}_{2.5}$) monitoring was conducted by three Palas Fidas units (one utilised for management only) at MPO during May 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 May 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 May 2023. Real time PM_{10} 24 hour rolling average results for May 2023 are presented in **Table 6-1**.

Table 6-1: MPO Palas Fidas PM₁₀ Data – May 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					
1/05/2023	6	4	7	13	44	50
2/05/2023	9	4	7	15.8	44	50
3/05/2023	13	5	8	30.6	44	50
4/05/2023	11	7	16	25.6	44	50
5/05/2023	8	8	21	21.2	44	50
6/05/2023	12	6	11	15.9	44	50
7/05/2023	10	5	8	27.2	44	50
8/05/2023	9	5	7	18.6	44	50
9/05/2023	12	8	13	14.8	44	50
10/05/2023	18	10	16	17.2	44	50
11/05/2023	15	10	18	15.2	44	50
12/05/2023	112	16	7	24.3	44	50
13/05/2023	22	13	6	21.6	44	50
14/05/2023	17	11	7	14.8	44	50
15/05/2023	22	13	6	15.4	44	50
16/05/2023	56	21	7	22.3	44	50
17/05/2023	16	15	8	15.3	44	50
18/05/2023	15	14	6	13.4	44	50
19/05/2023	39	11	5	12.5	44	50
20/05/2023	17	10	5	14.7	44	50
21/05/2023	29	11	8	36.1	44	50
22/05/2023	20	11	8	13.5	44	50
23/05/2023	29	22	22	27.3	44	50
24/05/2023	30	17	12	25.6	44	50
25/05/2023	22	18	16	20.4	44	50
26/05/2023	26	18	19	35	44	50
27/05/2023	32	10	-	34.1	44	50
28/05/2023	26	7	-	12.9	44	50
29/05/2023	20	7	-	17.5	44	50
30/05/2023	14	8	-	14.8	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 May 2023.

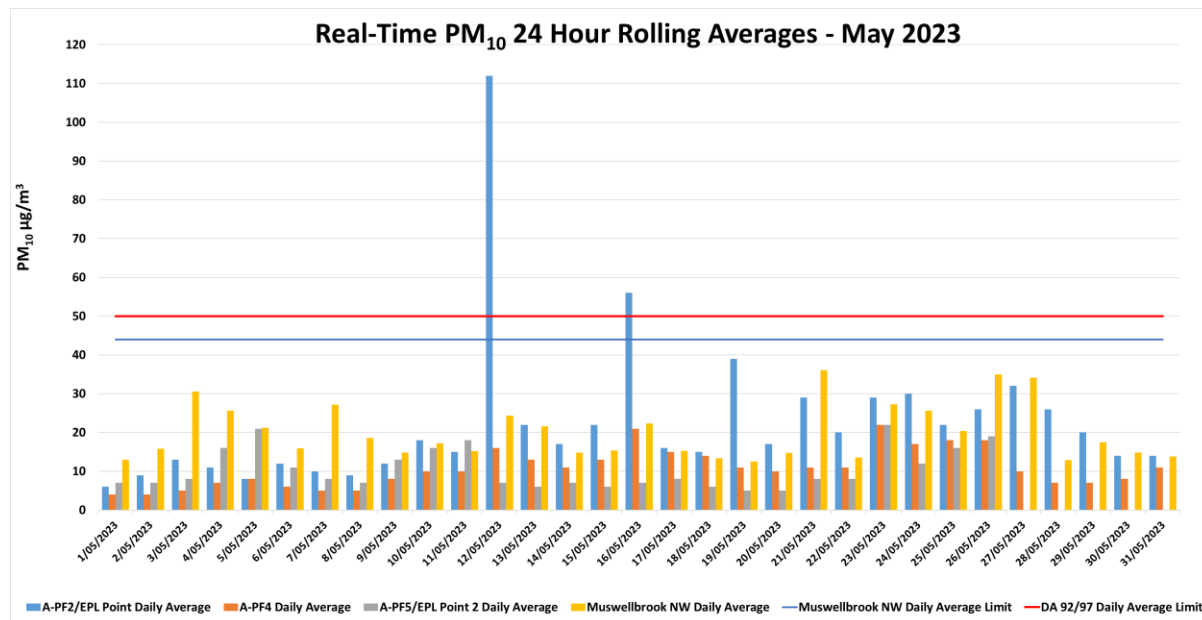


Figure 6-1: Real-time PM₁₀ 24 Rolling Average Results for May 2023.

6.2 PM₁₀ Results – Annual Rolling Average

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

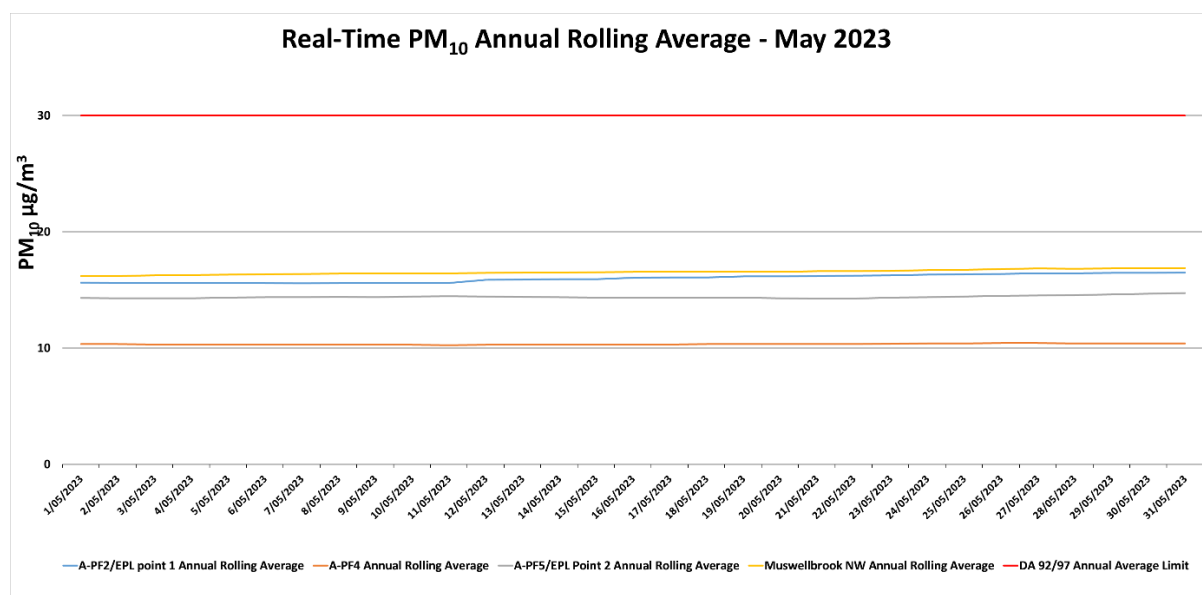


Figure 6-2: Real-time PM₁₀ Annual Rolling Average Results for May 2023.

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 May 2023. Real time PM_{2.5} 24 hour rolling average results for May 2023 are presented in **Table 6-2**.

Table 6-2: MPO Palas Fidas PM_{2.5} Data – May 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			
1/05/2023	2	2	3	25
2/05/2023	3	2	3	25
3/05/2023	3	2	3	25
4/05/2023	3	3	5	25
5/05/2023	3	3	5	25
6/05/2023	3	3	4	25
7/05/2023	3	3	3	25
8/05/2023	3	3	3	25
9/05/2023	3	3	4	25
10/05/2023	6	3	4	25
11/05/2023	5	3	5	25
12/05/2023	12	4	3	25
13/05/2023	9	5	3	25
14/05/2023	9	5	3	25
15/05/2023	8	5	3	25
16/05/2023	12	6	3	25
17/05/2023	6	5	3	25
18/05/2023	6	5	2	25
19/05/2023	6	5	2	25
20/05/2023	5	5	2	25
21/05/2023	6	6	4	25
22/05/2023	5	4	3	25
23/05/2023	6	6	5	25
24/05/2023	8	6	4	25
25/05/2023	6	6	5	25
26/05/2023	9	8	8	25
27/05/2023	10	4	-	25
28/05/2023	5	3	-	25
29/05/2023	4	3	-	25
30/05/2023	4	4	-	25
31/05/2023	4	4	-	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 May 2023 are presented in **Figure 6-3** below.

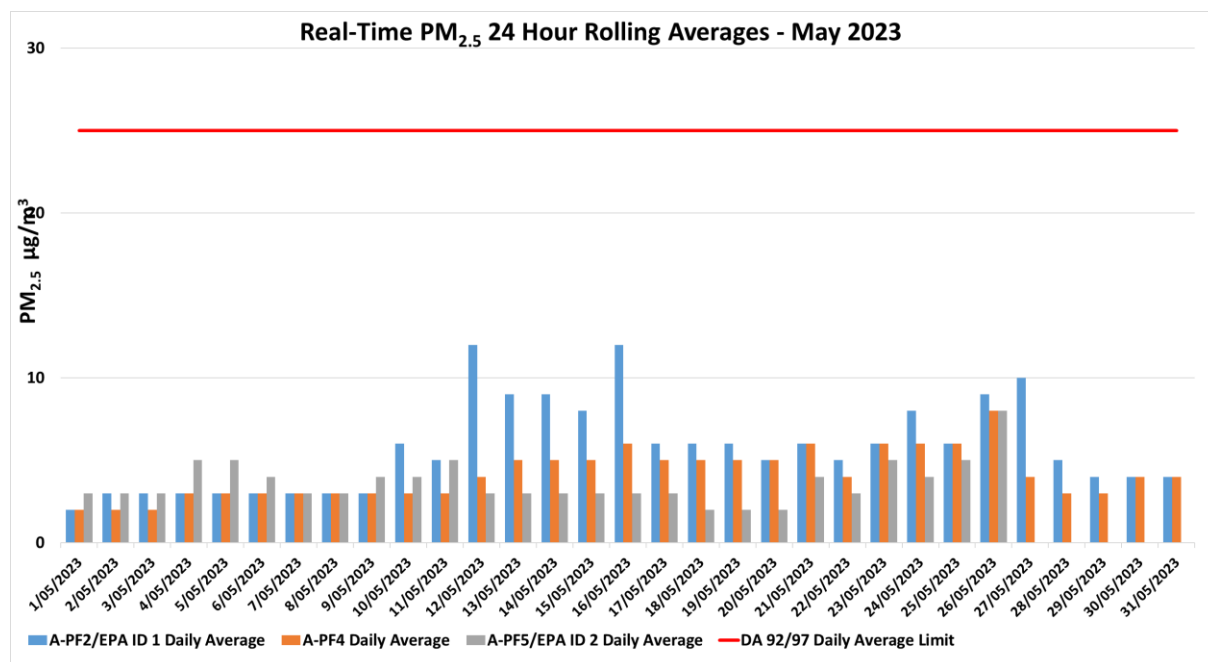


Figure 6-3: Real-time PM_{2.5} 24 hour Rolling Average Results for May 2023.

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 May 2023. Real time PM_{2.5} annual rolling averages during the reporting period are presented in **Figure 6-4** below.

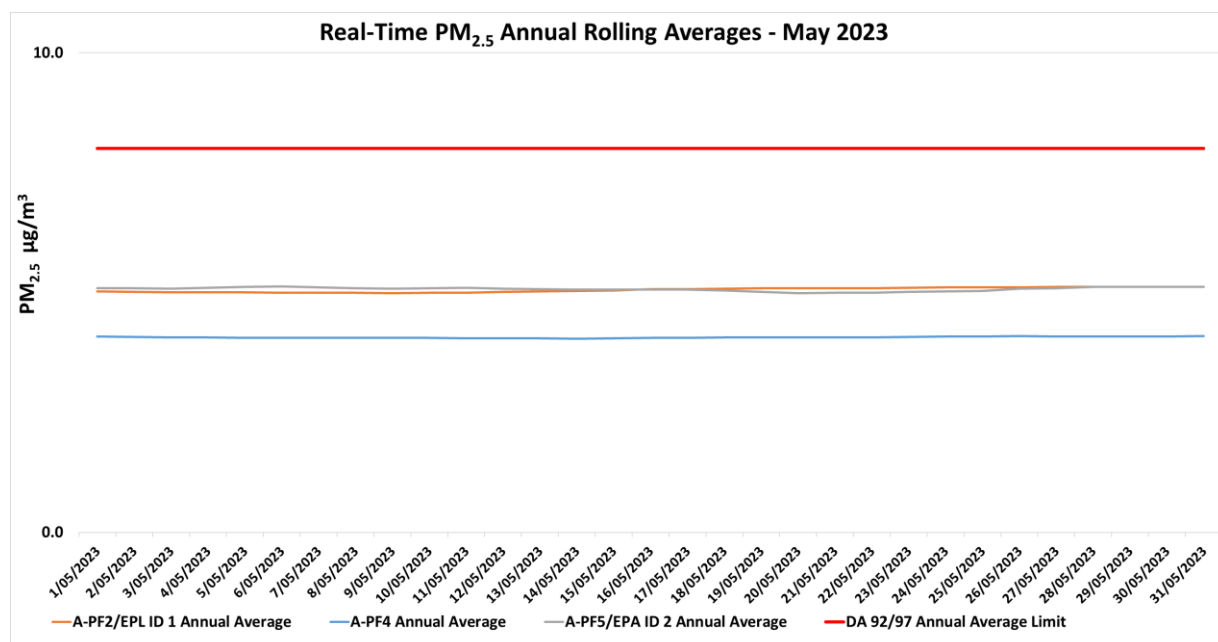


Figure 6-4: Real-time PM_{2.5} Annual Rolling Average Results for May 2023.

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 30 May 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 – 30 May 2023

Station	pH	Electrical Conductivity (EC) (µs/cm) ¹	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (TSS) (mg/L)
W1	8.3	660	362	<5
W2	8.3	810	444	6
W3	8.3	920	538	8
W4	7.9	3050	1960	11
W5	*	*	*	*
W6A	8.6	780	448	5
W9	*	*	*	*
W11	8.4	3550	2010	<5
W12	8.2	4950	2720	<5
W13	*	*	*	*
W14	*	*	*	*
W15	8.3	1150	655	15
W16	8.3	8850	5460	11
W17	8.2	1100	622	10

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 30 May monitoring event, four (4) sites were dry or contained insufficient water to sample. Sites W2 and W6a were outside of their respective pH. W2 and W6A and W17 exceeded there respective EC trigger limits. All sites were within there respective TSS trigger levels. Sites

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 completed on 22, 23, 24 and 31 May and 1, 5, 9, 13 and 30 June 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		May 2023 Water Level (DTW)	Feb 2023 Water Level (DTW)	Nov 2022 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
3500C500L	-	>± 0.5m	22.81	17.13	17.79	
3500C500S	-	>± 0.5m	23.42	19.86	17.39	
4500F000	-	>± 0.5m	22.45	22.73	23.84	
5000D000	-	>± 0.5m	123.75	120.72	115.23	
5000D000-R**	-	>± 0.5m	137.96	137.38	137.10	
5500D000	-	>± 0.5m	38.85	37.18	37.09	
6500F500L	-	>± 0.5m	52.97	52.78	52.86	
6500F500M	-	>± 0.5m	53.32	52.98	53.06	
6500F500U	-	>± 0.5m	30.29	30.32	30.38	
6500F625	-	>± 0.5m	14.43	13.34	12.14	
Melody	-	>± 0.5m	11.97	10.83	8.53	
7500F000	-	>± 0.5m	35.44	35.34	35.75	
WRA1L	-	>± 0.5m	0.93	0.00	0.00	
WRA1U	-	>± 0.5m	5.47	3.47	2.80	
WRA6L	-	>± 0.5m	1.10	1.10	0.60	
WRA6U	-	>± 0.5m	1.98	1.83	1.20	
MPBH1	9.71	10.70	10.25	9.96	8.39	No
MPBH1-C	-	>± 0.5m	10.25	10.06	8.55	
MPBH1-HR	-	>± 0.5m	26.13	29.61	34.75	
MPBH2	12.20	14.20	11.28	10.85	10.70	No
MPBH2-C	-	>± 0.5m	11.45	11.12	11.00	
MPBH2-HR	-	>± 0.5m	11.33	11.07	11.18	
MPBH3b	12.00	Dry (or 14.0m)	11.71	11.21	10.25	No
MPBH4	-	>± 0.5m	11.73	11.26	10.32	
MPBH4-C	-	>± 0.5m	11.20	10.74	9.92	
MPBH4-HR	-	>± 0.5m	50.55	50.54	50.65	
MPBH5	-	>± 0.5m	*	*	*	
MPBH5-C	-	>± 0.5m	10.55	10.34	10.50	
MPBH5-HR	-	>± 0.5m	10.79	10.43	10.48	
MPBH6	-	>± 0.5m	9.73	9.30	8.25	

Monitoring Location/ ID	Water Level Trigger Range		May 2023 Water Level (DTW)	Feb 2023 Water Level (DTW)	Nov 2022 Water Level (DTW)	Triggered (Yes/No)
	80 th Percentile (DTW)	Trigger				
MPBH6-C	-	>± 0.5m	11.23	10.91	10.44	
MPBH6-HR	-	>± 0.5m	11.96	10.62	9.54	
MPBH7	-	>± 0.5m	5.84	5.14	2.64	
MPBH7-C	-	>± 0.5m	15.51	13.15	10.47	

* Dry/insufficient water to sample

** New site

^ Unsafe access

Table 8-2 - MPO Quarterly Groundwater pH Results

Monitoring Location/ ID	pH Trigger Range		May 2023 pH	Feb 2023 pH	Nov 2022 pH	Triggered (Yes/No)
	Lower	Upper				
3500C500L	6.0	8.5	7.6	7.6	7.6	No
3500C500S			7.0	7.3	7.2	No
4500F000			6.8	6.9	6.9	No
5000D000-R			7.6	7.7	7.9	No
5500D000			7.0	7.1	7.0	No
6500F500L			7.2	7.3	7.2	No
6500F500M			*	7.5	7.3	No
6500F500U			6.8	6.9	6.8	No
6500F625			7.0	7.2	7.0	No
Melody			7.0	7.2	7.0	No
7500F000			7.9	7.7	7.7	No
WRA1L			7.2	7.1	7.1	No
WRA1U			7.2	7.2	7.2	No
WRA6L			7.0	6.9	7.1	No
WRA6U			6.9	6.9	6.9	No
MPBH1			6.9	6.9	7.0	No
MPBH1-C			8.2	8.7	8.7	No
MPBH1-HR			8.0	7.7	7.8	No
MPBH2			6.8	6.8	6.9	No
MPBH2-C			7.2	11.3	11.2	No
MPBH2-HR			8.2	8.1	8.3	No
MPBH3b			8.0	7.5	7.1	No
MPBH4			7.0	7.0	7.0	No
MPBH4-C			7.8	8.0	7.8	No
MPBH4-HR			7.4	7.3	7.4	No
MPBH5			*	*	*	-
MPBH5-C			9.7	9.6	10.3	Yes
MPBH5-HR			7.4	7.5	7.5	No
MPBH6			7.1	7.1	7.1	No
MPBH6-C			7.8	7.8	7.8	No
MPBH6-HR			7.3	7.1	7.4	No
MPBH7			7.1	6.8	7.2	No
MPBH7-C			7.2	7.4	7.3	No

* Dry/insufficient water to sample
- 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	May 2023 EC1	Feb 2023 EC1	Nov 2022 EC ¹	Triggered (Yes/No)
3500C500L	7800	3700	4100	3850	No
3500C500S	7800	5850	4200	4500	No
4500F000	22000	8700	8600	8450	No
5000D000-R	-	4300	4450	4250	-
5500D000	7800	4450	4500	4300	No
6500F500L	7800	2950	3000	2950	No
6500F500M	7800	*	3400	3100	No
6500F500U	7800	5550	5350	4750	-
6500F625	7800	3700	3450	4150	No
Melody	-	3800	2900	2850	-
7500F000	7800	5950	6350	6450	No
WRA1L	7800	3050	3250	2900	No
WRA1U	-	7850	3600	3250	-
WRA6L	7800	6750	6000	6150	No
WRA6U	22000	8050	8050	8350	No
MPBH1	800	690	700	620	No
MPBH1-C	-	1000	1550	1550	-
MPBH1-HR	-	1450	1800	2000	-
MPBH2	930	1150	1050	870	No
MPBH2-C	-	1100	1850	2150	-
MPBH2-HR	-	1500	1700	1800	-
MPBH3b	7800	4650	5700	7200	No
MPBH4	-	5450	5750	5500	-
MPBH4-C	-	4350	4550	4500	-
MPBH4-HR	-	5400	5600	5700	-
MPBH5	-	*	*	*	-
MPBH5-C	-	750	720	620	-
MPBH5-HR	-	780	900	890	-
MPBH6	-	1050	1300	1000	-
MPBH6-C	-	6250	7100	6700	-
MPBH6-HR	-	5250	1800	5200	-
MPBH7	-	10400	11000	9950	-
MPBH7-C	-	9950	10800	10900	-

* Dry/insufficient water to sample

- Indicates no trigger limit identified

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

During May 2023 monitoring event, Sites 6500F500M and MPBH5 contained insufficient water to sample and thirteen (13) 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 MPBH5-C. All monitoring locations were below their respective EC trigger limits except site MPBH2. The next quarterly monitoring event is scheduled for August 2023.

9. Noise Monitoring

Attended noise monitoring was undertaken during the night period of 30/31 May 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 May 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 – 30/31 May 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	30/05/2023 23:34	0.9	E	45	Yes	<20	No
N-AT2	30/05/2023 20:00	2.5	D	45	Yes	<20	No
N-AT3	30/05/2023 20:28	2.3	D	45	Yes	34	No
N-AT4	30/05/2023 20:54	2.3	E	45	Yes	26	No
N-AT5	31/05/2023 00:31	1.2	D	45	Yes	32	No
N-AT6	30/05/2023 23:57	0.8	F	45	Yes	<20	No

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.
6. Monitoring at N-AT5 was unable to be conducted due to a road closure.

Table 9-2 – $L_{Aeq,15min}$ Generated by MPO: Attended Night Monitoring – 30/31 May 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	30/05/2023 23:34	0.9	E	43	Yes	<20	No
N-AT2	30/05/2023 20:00	2.5	D	36	No	<20	No
N-AT3	30/05/2023 20:28	2.3	D	41	Yes	27	No
N-AT4	30/05/2023 20:54	2.3	E	42	Yes	22	No
N-AT5	31/05/2023 00:31	1.2	D	40	Yes	27	No
N-AT6	30/05/2023 23:57	0.8	F	35	No	<20	No

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 $L_{Aeq,15minute}$ attributed to MPO;
- IA = inaudible; and
- Bold results indicate exceedance of criteria.
- Monitoring at N-AT5 was unable to be conducted due to a road closure.

Table 9-3 – $L_{Aeq,period}$ Cumulative Noise: Attended Night Monitoring – 30/31 May 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	30/05/2023 23:34	40	<20	No
N-AT2	30/05/2023 20:00	40	<20	No
N-AT3	30/05/2023 20:28	40	27	No
N-AT4	30/05/2023 20:54	40	22	No
N-AT5	31/05/2023 00:31	40	27	No
N-AT6	30/05/2023 23:57	40	<20	No

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
- 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'.
- NA in exceedance column means criterion was not applicable due to atmospheric conditions.
- Monitoring at N-AT5 was unable to be conducted due to a road closure.

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 May (a total of 29 blasts YTD). Results for May 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 - May 2023

Day & Date Fired	Time Fired	Vibration (mm/s) BVOC	Overpressure (dBL) BVOC	Vibration (mm/s) BVO2	Overpressure (dBL) BVO2	Blast Fume Compliant
Thursday 4/05/2023	13:34	1.020	96.3	1.330	97.4	Y
Thursday 11/05/2023	15:53	0.470	92.7	0.490	95.5	Y
Thursday 18/05/2023	15:08	0.850	93	0.660	100.6	Y
Thursday 25/05/2023	16:10	0.370	93.8	0.340	103.6	Y
Friday 26/05/2023	11:53	1.380	95.9	0.850	106.4	Y
May 31/05/2023	13:08	0.120	101.6	0.170	104.9	Y

END OF REPORT