Monthly Environmental Monitoring Report

Yancoal Mount Thorley Warkworth

February 2025

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Revision History

Version No.	Version Details	Date
1.0	**Final**	**07/05/2025**

1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mount Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1 February to 28 February 2025.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

Meteorological data is collected at MTW's 'Charlton Ridge' meteorological station (refer to **Figure 3**).

2.1.1 Rainfall

Rainfall for the reporting period is summarised in **Table 1**. The year-to-date monthly rainfall totals, 2025 monthly rainfall totals and historical average monthly rainfall trend are shown in **Figure 1**.

Table 1: Monthly Rainfall MTW

2025	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
February	57.4	109.2

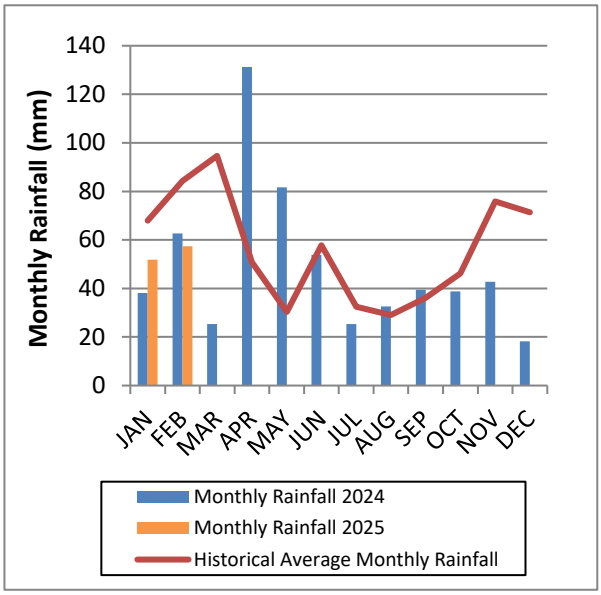


Figure 1: Rainfall Trend YTD

Note: The historical average monthly rainfall is calculated from 2007 to 2024 monthly totals.

2.1.2 Wind Speed and Direction

Winds from the South and Southeast were dominant during the reporting period as shown in **Figure 2.**

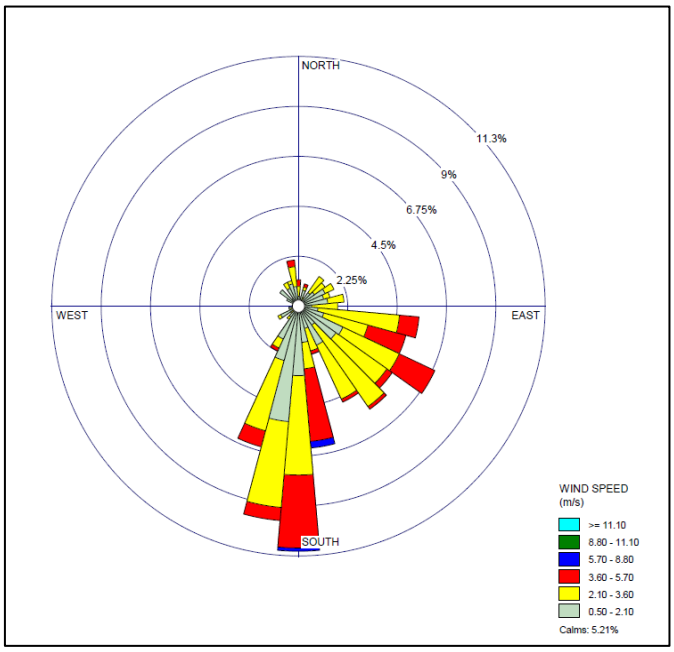


Figure 2: Charlton Ridge Wind Rose – February 2025

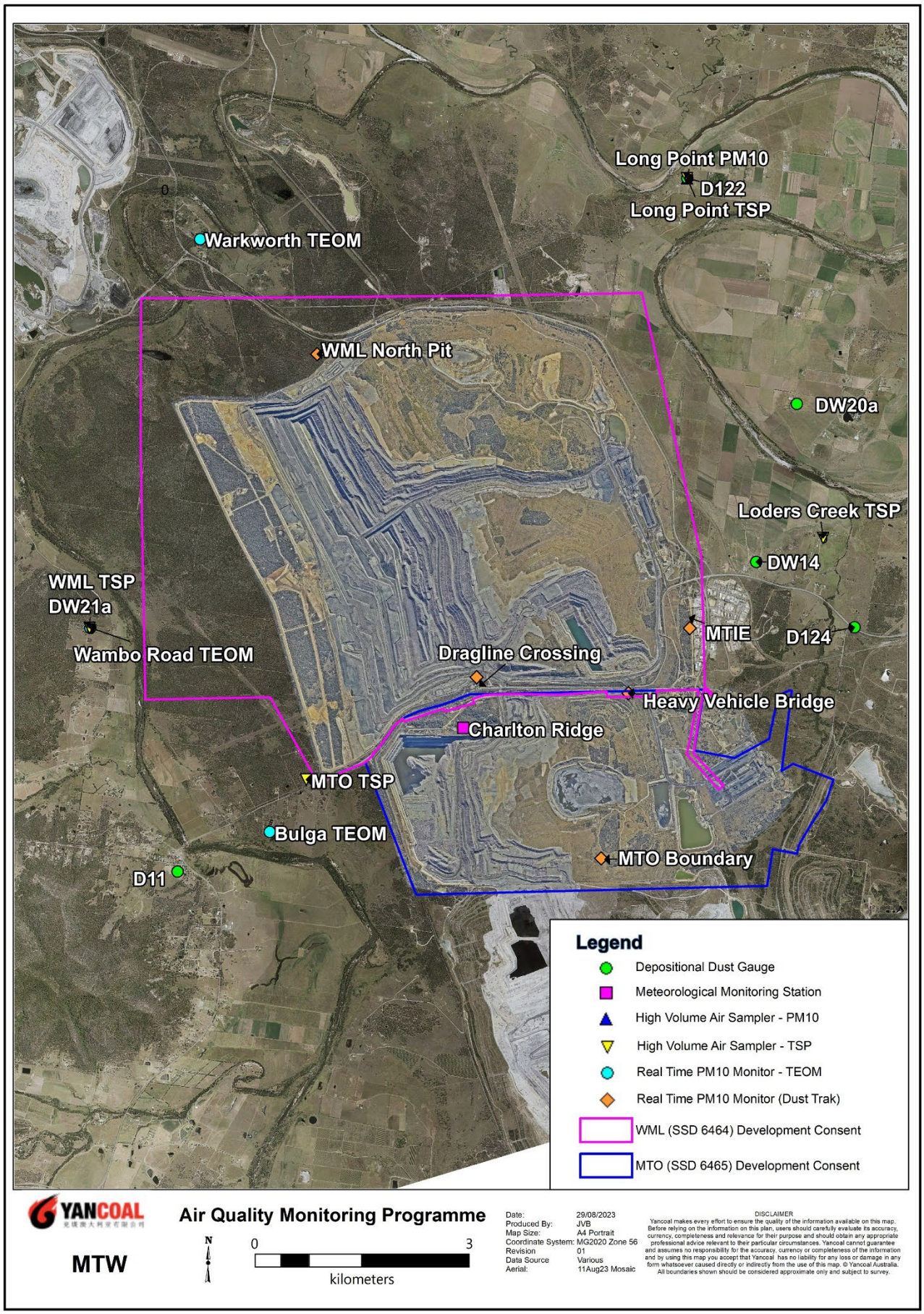


Figure 3: Air Quality Monitoring Locations

2.2 Depositional Dust

To monitor air quality, MTW operates and maintains a network of seven depositional dust gauges, situated on private and mine owned land surrounding MTW.

During the reporting period the Warkworth monitor recorded a monthly result above the long-term impact assessment criteria of 4.0 g/m2 per month. There is no evidence to suggest that the result is contaminated. Accordingly, the result will be included in the annual average calculation.

Figure 4 displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria.

An annual assessment of MTW's compliance with the Long-Term Impact Assessment Criteria will be provided in the 2025 Annual Review Report.

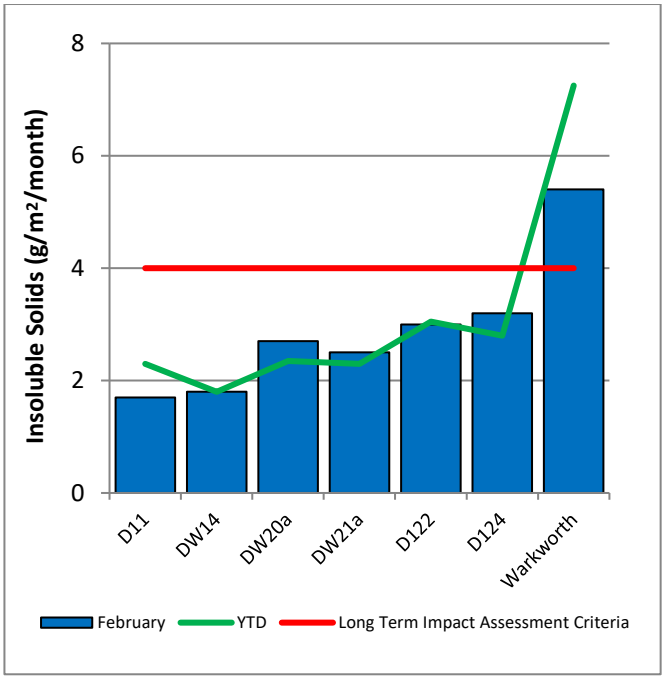


Figure 4: Depositional Dust – February 2025

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in **Figure 3**. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

Figure 5 shows the individual PM_{10} results at each monitoring station against the short-term impact assessment criteria of 50µg/m³.

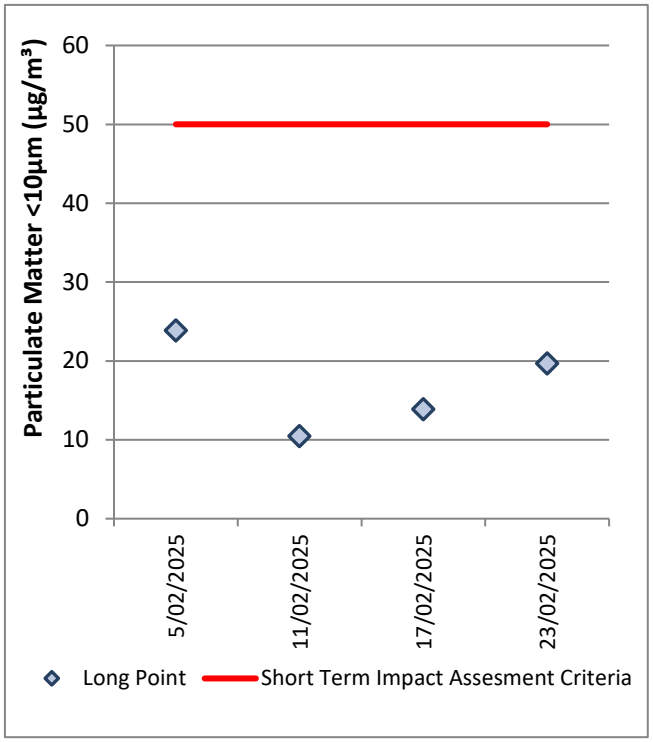


Figure 5: Individual PM10 Results – February 2025

Figure 6 shows the annual average PM10 result against the long-term impact assessment criteria.

An assessment of MTW's compliance with the Long-Term Impact Assessment Criteria will be provided in the 2025 Annual Review Report.

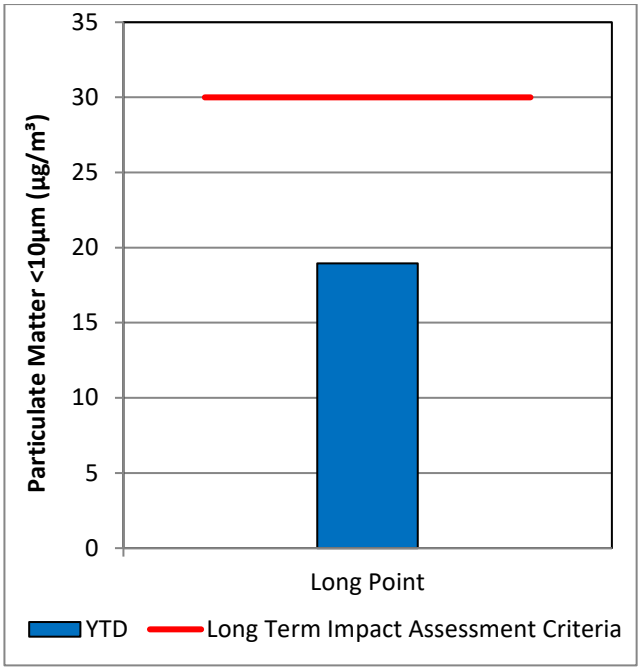


Figure 6: Annual Average PM_{10} – February 2025

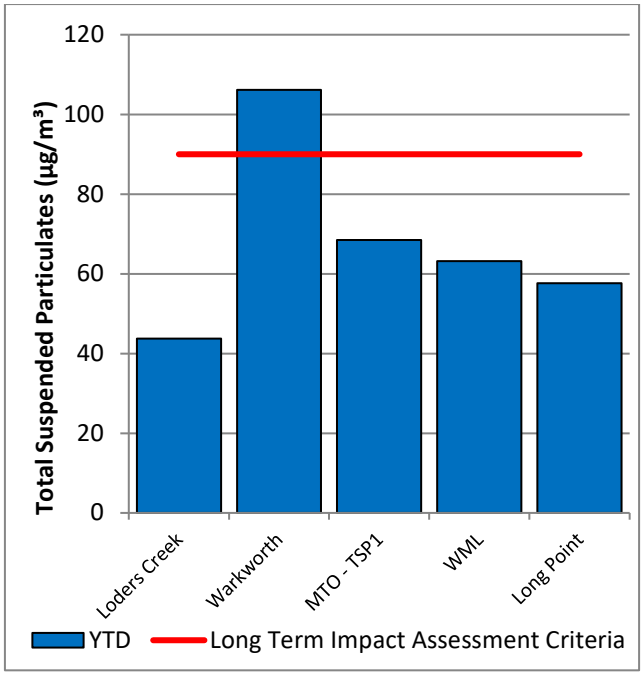


Figure 7: Annual Average Total Suspended Particulates – February 2025

2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long-term impact assessment criteria of 90µg/m³.

An assessment of MTW's compliance with the Long-Term Impact Assessment Criteria will be provided in the 2025 Annual Review Report.

2.3.3 Real Time PM_{10} Results

MTW maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating internal alerts when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in **Figure 8**, including the daily 24-hour average PM_{10} result and the annual PM_{10} average.

2.3.4 Real Time Alarms for Air Quality

During February, the real time monitoring system generated 60 automated air quality related alerts, including 5 alerts for adverse meteorological conditions and 55 alerts for elevated PM_{10} levels

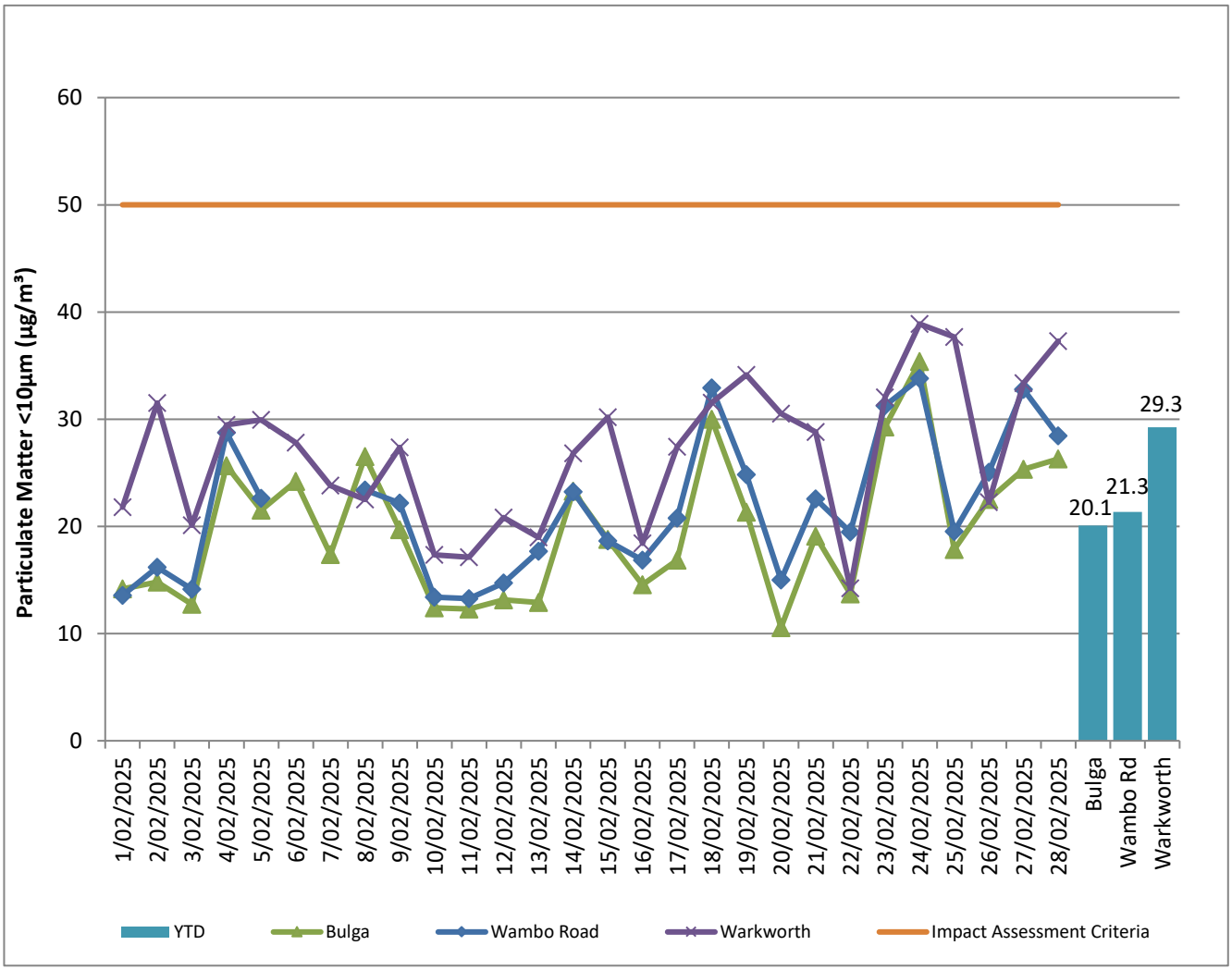


Figure 8: Real Time PM_{10} daily 24hr average (line graphs) and YTD annual average (column graphs) – February 2025

3.0 WATER QUALITY

MTW maintains a network of surface water and groundwater monitoring sites.

3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to record background water quality and to monitor the potential impact of mining on the river system. Other Hunter River tributaries are also monitored.

Results of monitoring are reported quarterly, next available in the March 2025 report.

3.2 HRSTS Discharge

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points located at Dam 1N and Dam 9S. Discharges can only take place subject to HRSTS regulations.

MTW did not undertake any HRSTS discharges in the reporting period.

3.3 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Groundwater results are reported quarterly, next available in the March 2025 report.

4.0 BLAST MONITORING

MTW have a network of six blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors.

The location of these monitors can be found in **Figure 15**.

4.1 Blast Monitoring Results

During February 2025, 15 blasts were initiated at MTW. **Figure 9** to **Figure 14** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in **Table 2**.

Table 2: Blasting Limits

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period at WML or MTO
120	0%
Ground Vibration (mm/s)	**Comments**
5	5% of the total number of blasts in a 12 month period at WML or MTO
10	0%

During the reporting period no blasts exceeded the 5mm/s criteria for ground vibration, or the 115dB(L) threshold for airblast overpressure.

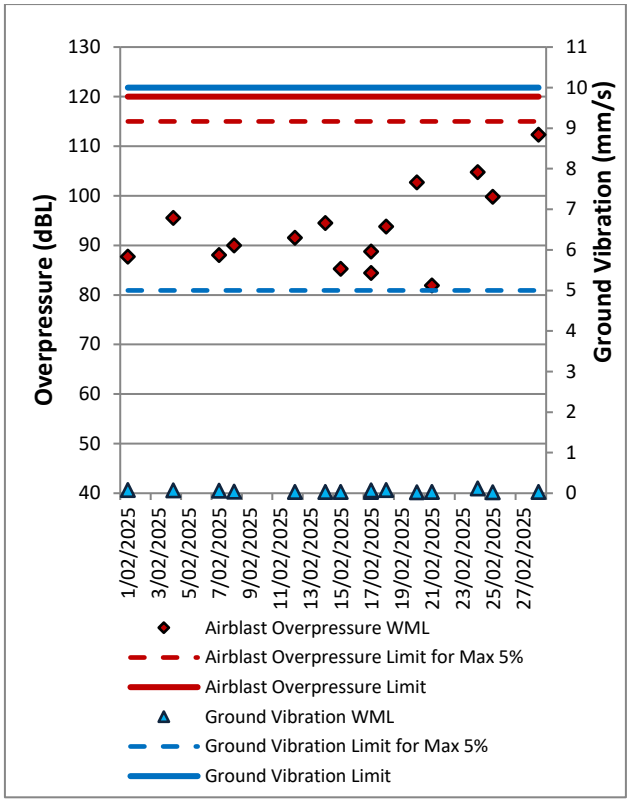


Figure 9: Abbey Green Blast Monitoring Results – February 2025

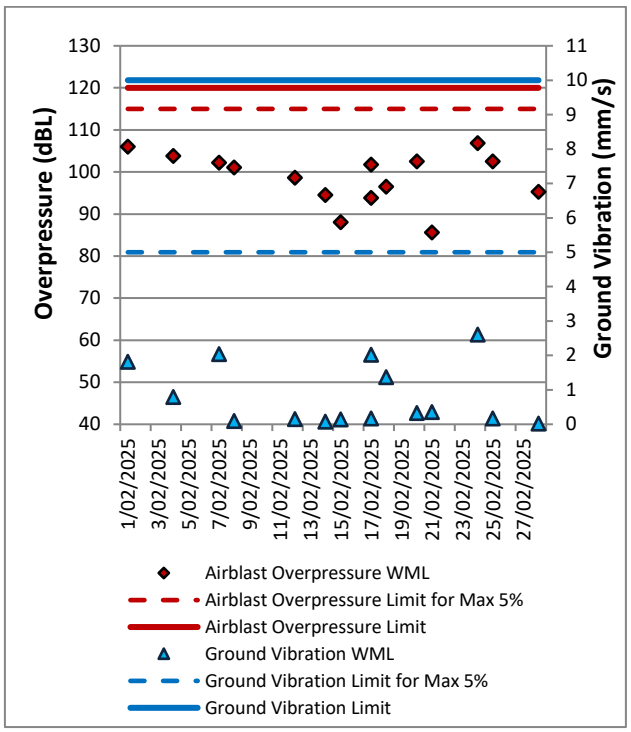


Figure 10: Bulga Village Blast Monitoring Results – February 2025

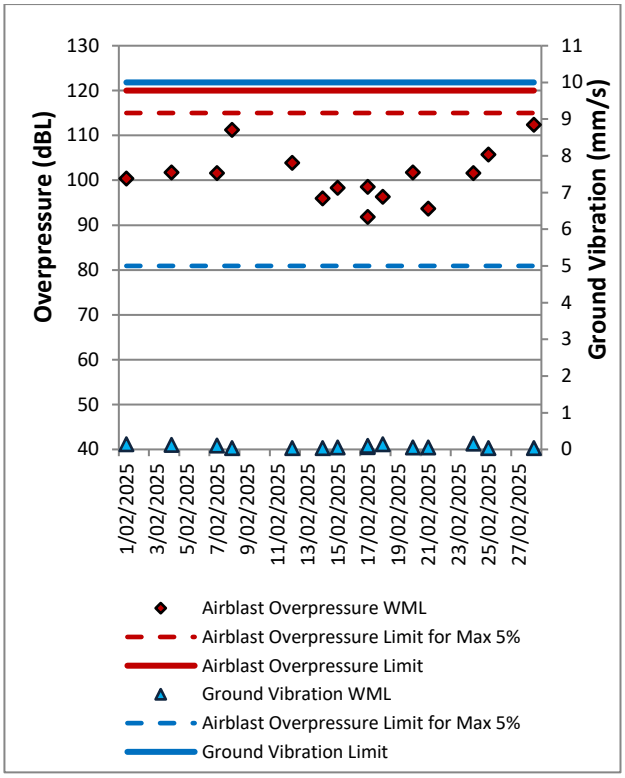


Figure 11: Putty Road MTIE Blast Monitoring Results – February 2025

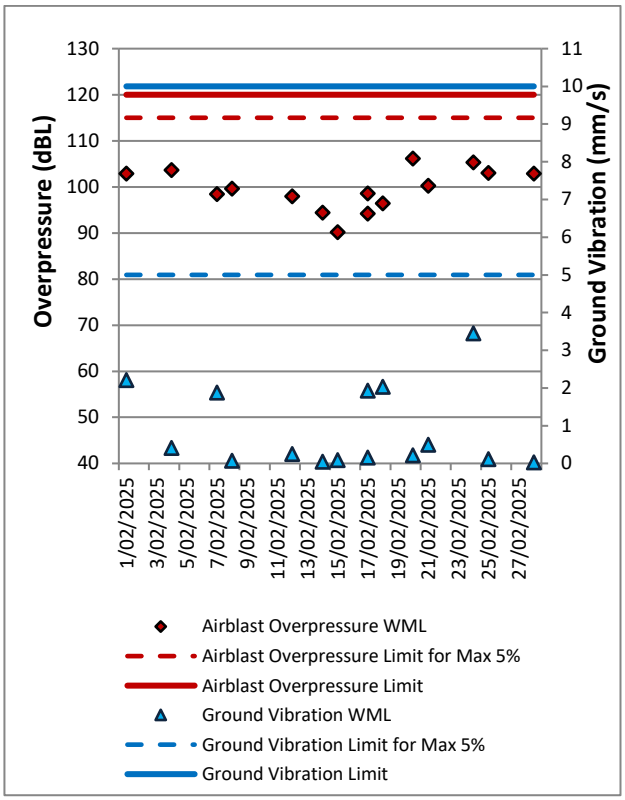


Figure 12: Wollemi Peak Road Blast Monitoring Results – February 2025

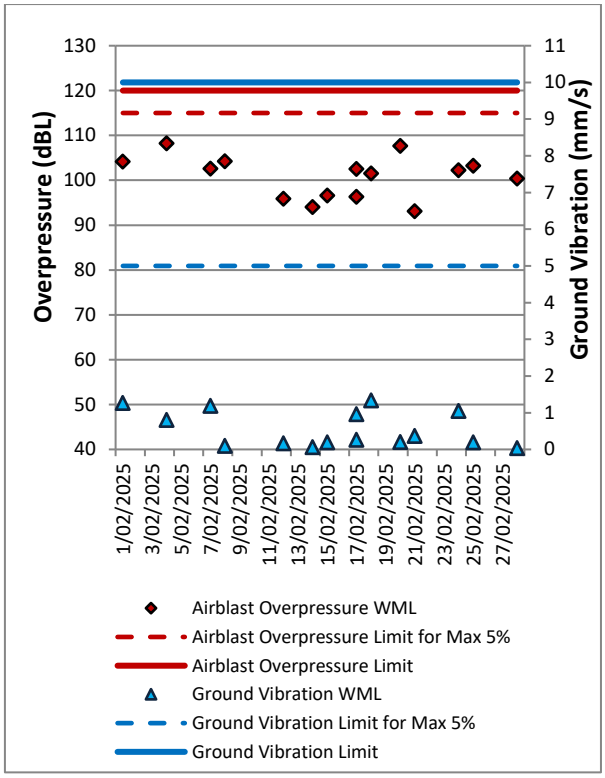


Figure 13: Wambo Road Blast Monitoring Results – February 2025

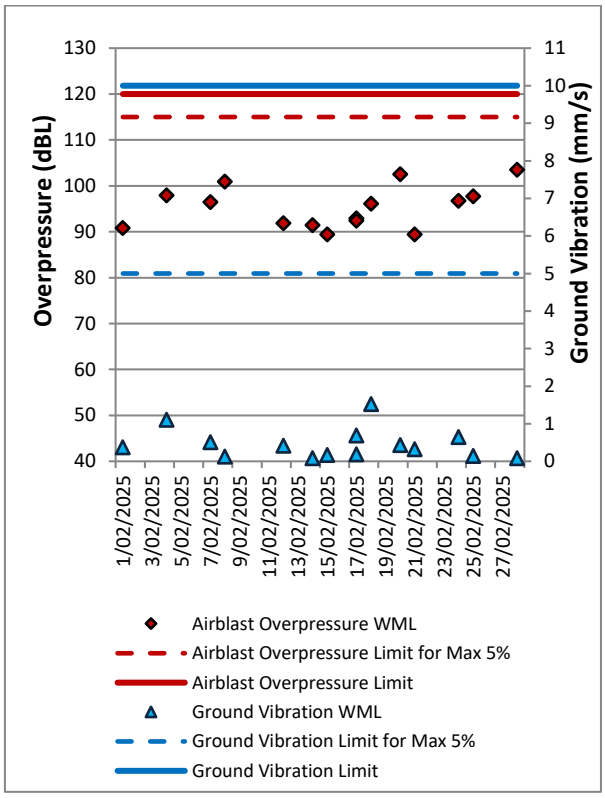


Figure 14: Warkworth Blast Monitoring Results – February 2025

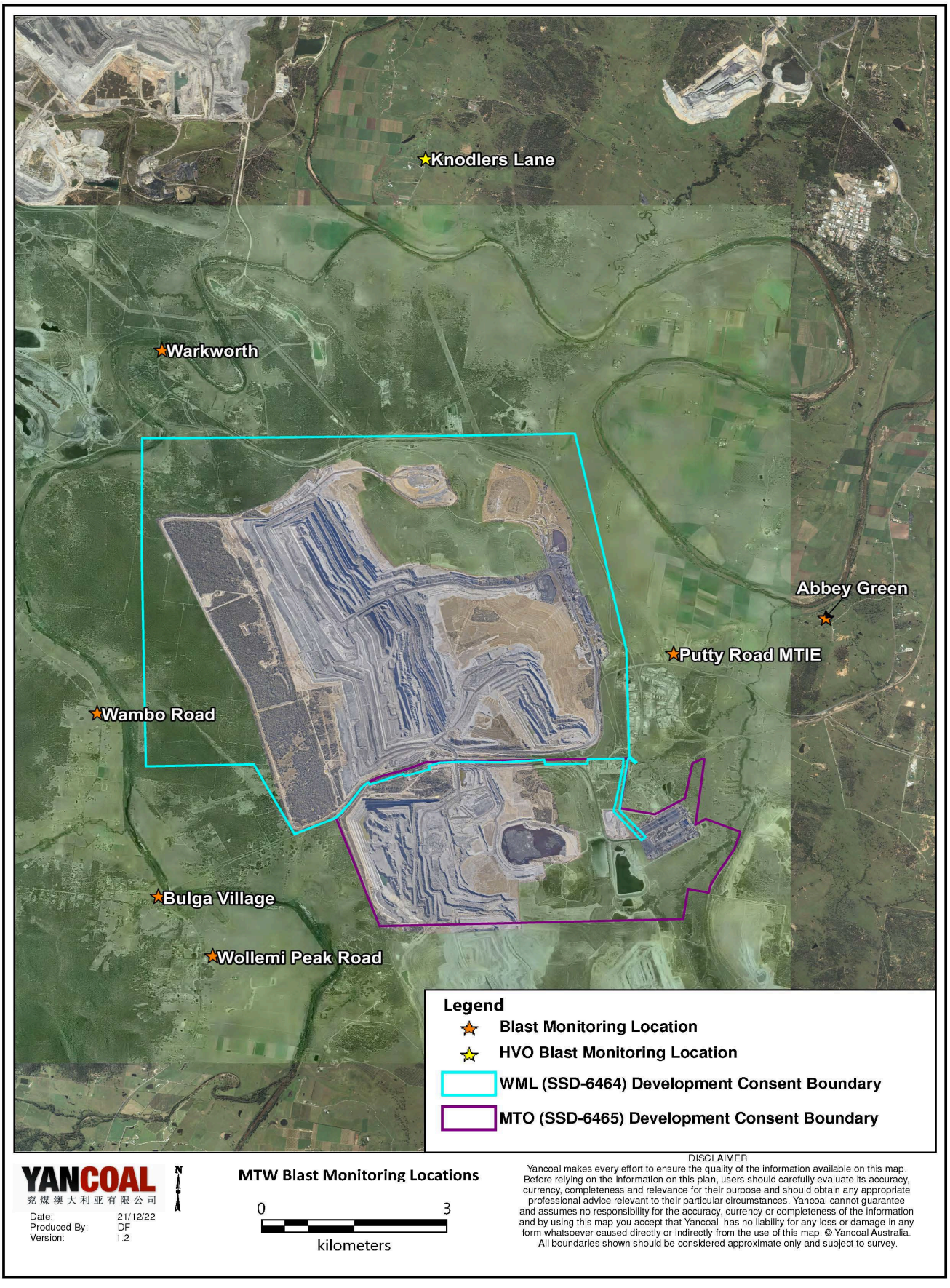


Figure 15: MTW Blast Monitoring Location Plan

5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Real time noise monitoring also occurs at five sites surrounding MTW. Noise monitoring locations are displayed in **Figure 16**.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the nights of 27/28 February and 12 March 2025. Measurements complied with the relevant criteria, with the exception of WML levels at the Bulga RFS monitoring location, where the LA1,1min noise level exceeded criteria by 5dB (refer to **Table 4**). In accordance with the NMP, five remeasures were completed approximately five minutes after the LA1,1minute exceedance was recorded to determine if a non-compliance occurred. WML noise levels complied with noise limits during all five remeasures, and as a result no non-compliance was recorded. Follow up monitoring conducted was scheduled to occur within one week as stated in the MTW Noise Management Plan, however adverse weather conditions related to Cyclone Alfred delayed the follow up measurement until 12 March 2025, which was as soon as practicable when meteorological conditions were suitable for monitoring to occur. The follow up monitoring also complied with the relevant criteria at the remeasured location, so no non-compliance is recorded. Results are detailed in **Table 3** to **Table 6.**

5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in **Tables 3** and **4**.

Table 3: $L_{Aeq,\ 15\ minute}$ Warkworth Impact Assessment Criteria – February 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML L_{Aeq} dB[2,3]	Exceedance[3,4]
Bulga RFS	27/02/2025 22:49	2.0	F	37	Yes	37	Nil
Bulga RFS[5]	12/03/2025 22:53	2.0	F	37	Yes	30	Nil
Bulga Village	27/02/2025 22:07	1.2	F	38	Yes	31	Nil
Gouldsville	27/02/2025 21:22	1.9	F	38	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	37	Yes	32	Nil
Inlet Road West	27/02/2025 21:00	2.3	F	35	No	<25	N/A
Long Point	27/02/2025 21:00	2.3	F	35	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	35	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	38	No	26	N/A

Notes:
1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; 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. Criterion may or may not apply due to rounding of meteorological data values;
2. Site-only $L_{Aeq,}$15minute attributed to WML, including modifying factors if applicable;
3. Bold results in red indicate exceedance of relevant criterion; and
4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.
5. Follow up measurement after measured exceedance.

Table 4: $L_{A1,\ 1\ minute}$ Warkworth - Impact Assessment Criteria – February 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML $L_{A1,\ 1min}$ dB[2,3]	Exceedance[3,4]
Bulga RFS	27/02/2025 22:49	2.0	F	47	Yes	**52**	**5**
Bulga RFS[5]	12/03/2025 22:53	2.0	F	47	Yes	33	Nil
Bulga Village	27/02/2025 22:07	1.2	F	48	Yes	35	Nil
Gouldsville	27/02/2025 21:22	1.9	F	48	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	47	Yes	45	Nil

Inlet Road West	27/02/2025 21:00	2.3	F	45	No	30	N/A
Long Point	27/02/2025 21:00	2.3	F	45	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	45	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	48	No	31	N/A

Notes:
1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; 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. Criterion may or may not apply due to rounding of meteorological data values;
2. Site-only LA1,1minute attributed to WML;
3. Bold results in red indicate exceedance of relevant criterion; and
4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.
5. Follow up measurement after measured exceedance.

5.1.2 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in **Table 5** and **6**.

Table 5: $L_{Aeq,\ 15minute}$ Mount Thorley - Impact Assessment Criteria – February 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO L_{Aeq} dB[2,3]	Exceedance[3,4]
Bulga RFS	27/02/2025 22:49	2.0	F	37	Yes	32	Nil
Bulga RFS[5]	12/03/2025 22:53	2.0	F	37	Yes	27	Nil
Bulga Village	27/02/2025 22:07	1.2	F	38	Yes	<25	Nil
Gouldsville	27/02/2025 21:22	1.9	F	35	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	37	Yes	<20	Nil
Inlet Road West	27/02/2025 21:00	2.3	F	35	No	<20	N/A
Long Point	27/02/2025 21:00	2.3	F	35	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	36	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	38	No	31	N/A

Notes:
1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; 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. Criterion may or may not apply due to rounding of meteorological data values;
2. Site-only LAeq,15minute attributed to MTO, including modifying factors if applicable;
3. Bold results in red indicate exceedance of relevant criterion; and
4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.
5. Follow up measurement after measured exceedance.

Table 6: $L_{A1,\ 1Minute}$ Mount Thorley - Impact Assessment Criteria – February 2025

Location[5]	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO $L_{A1,\ 1min}$ dB[2,3]	Exceedance[3,4]
Bulga RFS	27/02/2025 22:49	2.0	F	47	Yes	35	Nil
Bulga RFS[5]	12/03/2025 22:53	2.0	F	47	Yes	32	Nil
Bulga Village	27/02/2025 22:07	1.2	F	48	Yes	30	Nil
Gouldsville	27/02/2025 21:22	1.9	F	45	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	47	Yes	<25	Nil
Inlet Road West	27/02/2025 21:00	2.3	F	45	No	<20	N/A
Long Point	27/02/2025 21:00	2.3	F	45	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	46	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	48	No	35	N/A

Notes:
1. Noise criteria apply during all meteorological conditions except the following: wind speeds greater than 3 m/s measured at 10 metres above ground level; 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. Criterion may or may not apply due to rounding of meteorological data values;
2. Site-only LA1,1minute attributed to MTO;
3. Bold results in red indicate exceedance of relevant criterion; and
4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.
5. Follow up measurement after measured exceedance.

5.1.3 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification factor corrections has been assessed. This resulted in the application of a 2dB penalty to the site only LAeq for the measurements taken at Bulga RFS on 27 February 2025. Resulting LAeq noise levels did not exceed the WML impact assessment criteria at Bulga RFS. . The WML assessment for low frequency noise is shown in **Table 7** and the MTO assessment for low frequency noise is shown in **Table 8**.

Table 7: Warkworth Low Frequency Noise Assessment – February 2025

Location[3]	Date and Time	Measured WML LAeq dB	Criterion Applies?	Intermittency Modifying Factor? [1]	Tonality Modifying Factor? [1]	Frequency of Tonality [1]	Low-frequency Modifying Factor?	Maximum Exceedance of Reference Spectrum [1,2]	Penalty dB [2]
Bulga RFS	27/02/2025 22:49	35	Yes	No	No	N/A	**Yes**	**1 dB at 80 Hz**	**+2 dB**
Bulga RFS [3]	12/03/2025 22:53	31	Yes	No	No	N/A	No	N/A	Nil
Bulga Village	27/02/2025 22:07	<30	Yes	No	No	N/A	No	N/A	Nil
Gouldsville	27/02/2025 21:22	IA	Yes	No	No	N/A	No	N/A	Nil
Inlet Road	27/02/2025 21:21	<30	Yes	No	No	N/A	No	N/A	Nil
Inlet Road West	27/02/2025 21:00	<25	No	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	27/02/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	28/02/2025 01:06	<20	Yes	No	No	N/A	No	N/A	Nil
Wambo Road	27/02/2025 21:45	<25	No	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
1. Yes/No denote modifying factor was or was not applied. NA denotes 'not applicable'; and
2. Bold results indicate that application of NPfI modifying factor/s is required.
3. Follow up measurement within one week of measured exceedance.

Table 8: Mount Thorley Operations Low Frequency Noise Assessment – February 2025

Location[3]	Date and Time	Measured MTO LAeq dB	Criterion Applies?	Intermittency Modifying Factor? [1]	Tonality Modifying Factor? [1]	Frequency of Tonality[1]	Low-frequency Modifying Factor? [1]	Maximum Exceedance of Reference Spectrum [1,2]	Penalty dB[2]
Bulga RFS	27/02/2025 22:49	30	Yes	No	No	N/A	No	N/A	Nil
Bulga RFS [3]	12/03/2025 22:53	30	Yes	No	No	N/A	No	N/A	Nil
Bulga Village	27/02/2025 22:07	<25	Yes	No	No	N/A	No	N/A	Nil
Gouldsville	27/02/2025 21:22	IA	Yes	No	No	N/A	No	N/A	Nil
Inlet Road	27/02/2025 21:21	<20	Yes	No	No	N/A	No	N/A	Nil
Inlet Road West	27/02/2025 21:00	<20	No	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	27/02/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	28/02/2025 01:06	<20	Yes	No	No	N/A	No	N/A	Nil
Wambo Road	27/02/2025 21:45	<30	No	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. Yes/No denote modifying factor was or was not applied. NA denotes 'not applicable'; and

2. Bold results indicate that application of NPfI modifying factor/s is required.

3. Follow up measurement within one week of measured exceedance.

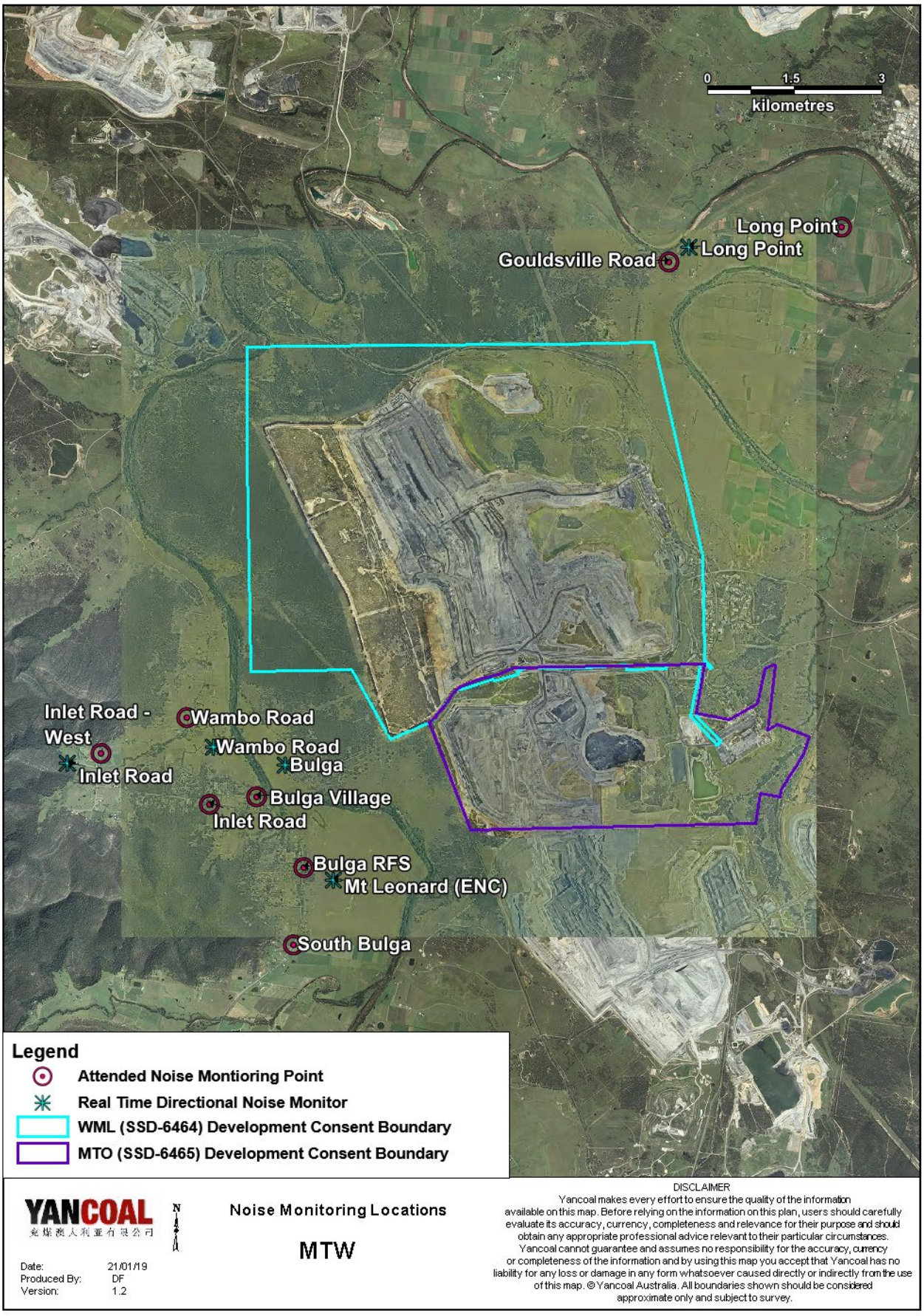


Figure 16: Noise Monitoring Location Plan

5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option);
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.

A summary of these assessments undertaken during February are provided in **Table 9**.

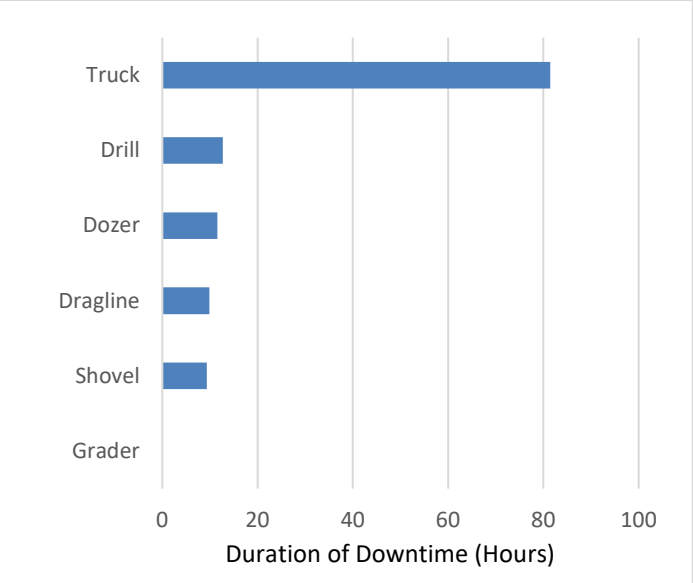
Table 9: Supplementary Attended Noise Monitoring Data – February 2025

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
611	5	4	0.81

6.0 OPERATIONAL DOWNTIME

During February, a total of 124.9 hours of equipment downtime was logged in response to environmental events such as dust, noise and adverse meteorological conditions. Operational downtime by equipment type is shown in **Figure 17**.

Figure 17: Operational Downtime by Equipment Type – February 2025



7.0 REHABILITATION

During February 2025, 27.0 Ha of land was released, 4.3 Ha was bulk shaped and 5.9 Ha was top soiled.

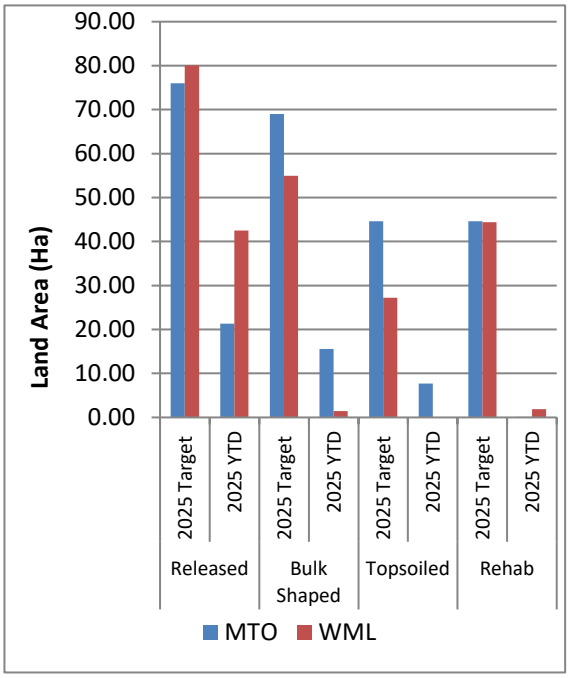


Figure 18: Rehabilitation YTD – February 2025

8.0 ENVIRONMENTAL INCIDENTS

There was no environmental incident recorded during the reporting period.

9.0 COMPLAINTS

Eight complaints were received during the reporting period. Details of these complaints are shown in **Table 10**.

Table 10: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	0	3	3	2	0	8
February	2	0	3	2	1	8
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
Total	2	3	6	4	1	16

Appendix A: Meteorological Data

Table 11: Meteorological Data – Charlton Ridge Meteorological Station – February 2025

Date	Air Temperature		Relative Humidity		Wind Direction	Wind Speed	Rainfall
	Maximum (°C)	Minimum (°C)	Maximum (%)	Minimum (%)	Average (°)	Average (m/sec)	total (mm)
1/02/2025	27	18	100	53	135	2.9	1.8
2/02/2025	30	16	97	38	140	2.6	0.0
3/02/2025	33	16	99	39	142	2.7	0.0
4/02/2025	33	18	94	41	136	1.5	0.0
5/02/2025	36	16	100	32	205	1.4	16.8
6/02/2025	32	19	98	44	141	2.5	0.0
7/02/2025	33	17	100	27	154	1.8	0.0
8/02/2025	34	17	100	19	177	2.1	0.4
9/02/2025	33	18	100	40	176	2.3	2.6
10/02/2025	25	16	100	57	210	2.0	3.8
11/02/2025	23	15	100	67	189	1.4	11.2
12/02/2025	30	15	100	45	152	2.4	12.2
13/02/2025	32	18	100	44	129	2.0	0.2
14/02/2025	31	18	100	49	158	1.3	1.8
15/02/2025	32	17	100	23	194	1.8	5.4
16/02/2025	27	12	77	19	169	2.7	0.0
17/02/2025	26	11	83	33	158	2.1	0.0
18/02/2025	29	17	80	27	137	2.1	0.0
19/02/2025	30	15	87	36	139	3.0	0.0
20/02/2025	28	16	96	49	173	4.1	0.0
21/02/2025	27	17	95	50	153	3.3	0.0
22/02/2025	30	17	97	44	124	2.2	0.0
23/02/2025	33	13	100	34	140	1.8	0.0
24/02/2025	37	17	95	24	178	2.6	0.0
25/02/2025	28	18	89	56	176	4.2	0.0
26/02/2025	31	17	100	41	148	2.4	0.6
27/02/2025	34	18	100	33	136	2.0	0.6
28/02/2025	39	18	97	19	178	2.3	0.0