Wambo Coal Mine and Rail Spur

Environmental noise monitoring

Prepared for Wambo Coal Pty Limited

September 2026

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Wambo Coal Pty Limited

E251068 RP9

September 2026

Version	Date	Prepared by	Reviewed by	Comments
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1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wambo Coal Pty Limited to conduct a monthly noise survey of operations at Wambo Coal Mine (WCM, the site) and Wambo Coal Rail Spur (WCRS) located near Warkworth, NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done at five monitoring locations during the night period of 14/15 September 2026.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location descriptor	Description	Coordinates (MGA56)	
		Easting	Northing
N01	North Bulga	313352	6388696
N16	Jerrys Plains Road	306000	6399785
N20A	Redmanvale Road Central	304461	6398713
N21	South Wambo	310491	6390223
N26	Redmanvale Road South	304172	6398160

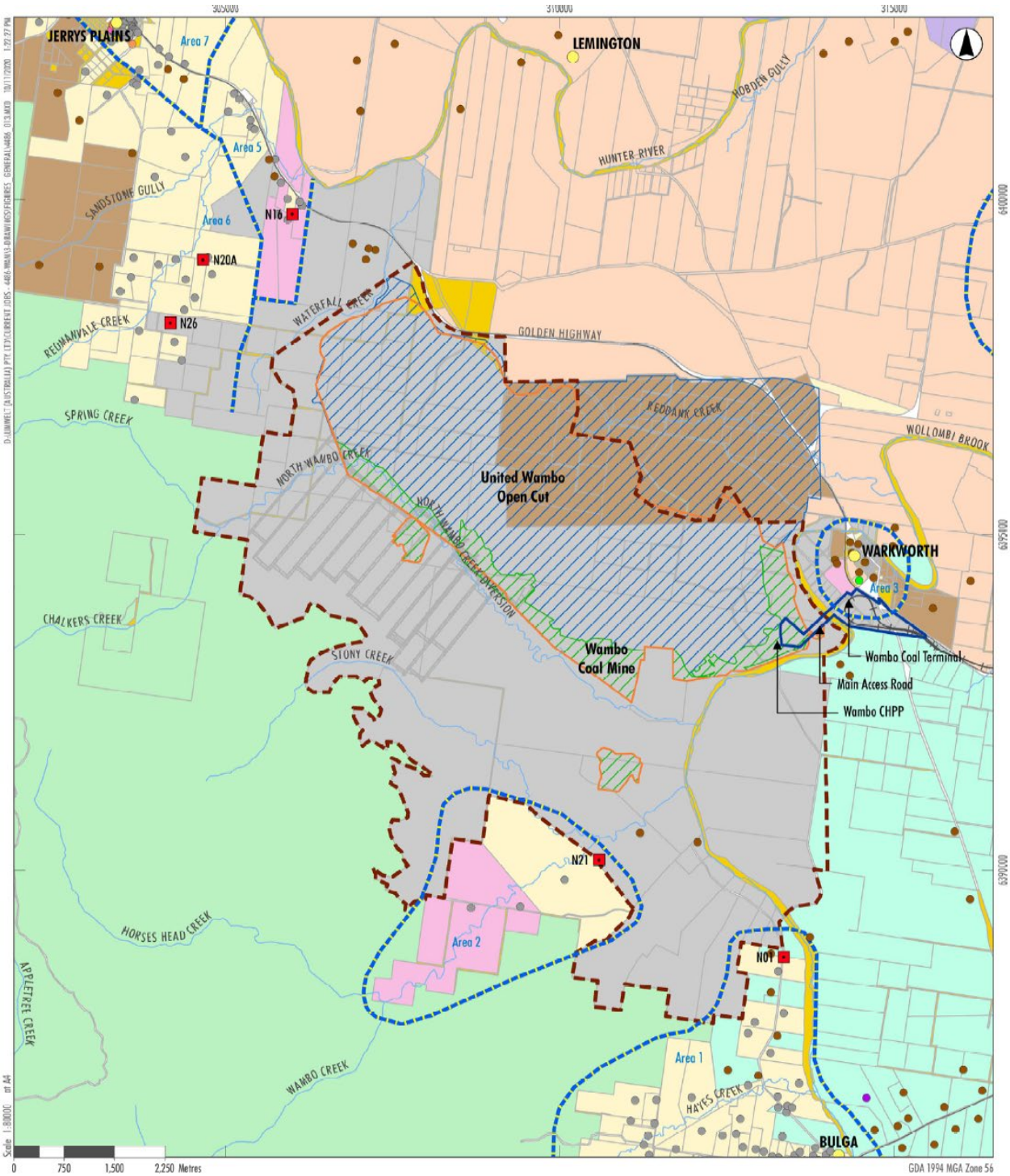

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.
WC	Wambo Coal
WCM	Wambo Coal Mine
WCRS	Wambo Coal Road Spur

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Project approval

2.1.1 WCM development consent

The most current development consent for WCM is DA 305-7-2003 (MOD 19, 25 January 2023). Schedule 2, Part B and Appendix 5 of which detail specific conditions relating to noise generated by the site. Relevant WCM consent sections are reproduced in Appendix B.1.

2.1.2 WCRS development consent

The most current development consent for Wambo Rail Loop is WCRS DA 177-8-2004 (MOD 3, 29 August 2019), last modified to include a rail refuelling facility. Schedule 2, Part B of which details specific conditions relating to noise generated by WCRS. Relevant WCRS consent sections are reproduced in Appendix B.2.

2.2 Environment protection licence

WCM holds Environment Protection Licence (EPL) No. 529 issued by the NSW Environment Protection Authority (EPA), most recently on 9 June 2026. Relevant sections of the EPL are reproduced in Appendix B.3.

2.3 Noise management plan

Noise monitoring requirements are detailed in the Wambo Coal Noise Management Plan WA-ENV-MNP-503 (NMP, July 2023), prepared in accordance with the WCM and WCRS consents. Relevant sections of the NMP are reproduced in Appendix B.4.

2.4 Noise limits

Noise impact limits based on Phase 2 and 3 of the development consent (MOD 19) and the NMP are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N01 [1]	37	37	37	47
N16	35	35	35	45
N20A	35	35	35	45
N21 [2]	39	39	39	49
N26	35	35	35	45

Notes: 1. Noise criteria for the nearest privately-owned property (R007) have been adopted.

2. Noise criteria for the nearest privately-owned property (R025) have been adopted.

EPL noise limits have not been updated for Phase 2 and 3 of operations. As limits in the development consent and NMP are now more conservative than those in the EPL they have been adopted in Table 2.1.

2.5 Meteorological conditions

Appendix 5 of the WCM consent details specific meteorological conditions required for noise limits to be applicable:

APPENDIX 5 NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in condition B12 are to apply under all meteorological conditions except the following:
   - (a) where 3°C/100 metres (m) lapse rates have been assessed, then:
     - (i) wind speeds greater than 3 metres/second (m/s) measured at 10m above ground level;
     - (ii) temperature inversion conditions between 1.5°C and 3°C/100m and wind speeds greater than 2m/s measured at 10m above ground level; or
     - (iii) temperature inversion conditions greater than 3°C/100m.
   - (b) where Pasquill Stability Classes have been assessed, then:
     - (i) wind speeds greater than 3m/s at 10m above ground level;
     - (ii) stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level;
     - (iii) stability category G temperature inversion conditions.

As lapse rates (VTG) were not measured directly, meteorological conditions have been assessed against requirements detailed in 1(b), which are consistent with the EPL.

2.6 Additional requirements

The NSW EPA 'Industrial Noise Policy' (INP 2000) was replaced by the 'Noise Policy for Industry' (NPfI) in October 2017.

The WCM consent specifies that that attended compliance monitoring must be carried out in accordance with the relevant requirements set out in the NSW INP. However, assessment of modifying factors has been done in accordance with Fact Sheet C of the NPfI, as specified by Appendix 5 Condition 3 of the WCM consent and the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017).

The EPL specifies that attended compliance monitoring must be carried out in accordance with the NSW NPfI. Compliance against both policies has been assessed in this report.

Monitoring and reporting have been done in accordance with the EPA 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022.

2.7 Very noise-enhancing meteorological conditions

In accordance with the Approved Methods, monthly noise monitoring for the site is scheduled to occur during forecasted meteorological conditions where noise limits in Table 2.1 will be applicable. However, in cases where actual meteorological conditions do not align with forecasts and noise limits are subsequently not directly applicable, it is the expectation of regulators that noise impact still be managed.

The NPfI states that:

> Noise limits derived for consents and licences will apply under the meteorological conditions used in the environmental assessment process, that is, standard or noise-enhancing meteorological conditions. For 'very noise-enhancing meteorological conditions' … a limit is set based on the limit derived under standard or noise-enhancing conditions (whichever is adopted in the assessment) plus 5 dB. In this way a development is subject to noise limits under all meteorological conditions.

Therefore, if monthly noise monitoring occurs during meteorological conditions outside of those specified in Section 2.5, site limits will be adjusted based on Table 2.1 plus 5 dB.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of site noise may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Meteorological data

Meteorological data was obtained from the WCM automated weather station (AWS) which allowed correlation of atmospheric parameters with measured noise levels. This data was logged at 10-minute intervals. Atmospheric parameters include wind speed, wind direction, rainfall, and sigma theta. When meteorological data is provided in less than 15-minute intervals, analysis must be conducted to determine the meteorological conditions present for the majority of each measurement period and whether those conditions result in noise criteria being applicable or not.

3.4 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI at the time of measurement. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq} noise levels.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

3.5 Instrumentation and personnel

Attended noise monitoring was conducted by Kirsten Garlick and Isaac Hepworth. Qualifications, experience, and/or demonstration of competence in accordance with the Approved methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix C.

Table 3.1 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	00370304	08/11/2026	IEC 61672-1:2002
NTi XL3 sound level meter	A3A-02523-F0	26/06/2028	IEC 61672-1:2019
Svantek SV36 acoustic calibrator	138014	26/08/2027	IEC 60942:2017
Svantek SV36 acoustic calibrator	138017	09/09/2027	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each 15-minute attended measurement are provided in Table 4.1. Discussion as to the sources responsible for total is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – September 2026 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N01	15/09/2026 00:11	46	39	32	31	30	28	26
N16	15/09/2026 00:57	59	40	32	31	29	27	25
N20A	14/09/2026 23:57	40	32	30	28	28	26	24
N21	15/09/2026 00:36	45	39	34	32	31	29	26
N26	14/09/2026 22:57	51	36	30	28	26	24	21

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.2. The wind speed, direction and temperature were measured at approximately 1.5 metres (m). Attended noise monitoring is not done during rain, hail, or wind speeds above 5 metres per second (m/s) at microphone height.

Table 4.2 Measured atmospheric conditions – September 2026

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction ° magnetic north [1]	Cloud cover 1/8s
N01	15/09/2026 00:11	12	<0.5	90	0
N16	15/09/2026 00:57	19	<0.5	-	1
N20A	14/09/2026 23:57	18	<0.5	-	0
N21	15/09/2026 00:36	14	<0.5	240	0
N26	14/09/2026 22:57	16	<0.5	-	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.2.2 Consent monitoring results

Table 4.3 and Table 4.4 provide site noise levels in the absence of other sources, where possible, and includes weather data from the site AWS. Consent limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.3 Site noise levels and consent limits – September 2026

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Consent limits, dB		Site levels, dB		Exceedances, dB	
		Speed, m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$ [3]	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N01	15/09/2026 00:11	0.9	333	F	Yes	37	47	IA	IA	Nil	Nil
N16	15/09/2026 00:57	0.5	82	F	Yes	35	45	IA	IA	Nil	Nil
N20A	14/09/2026 23:57	0.9	313	F	Yes	35	45	IA	IA	Nil	Nil
N21	15/09/2026 00:36	0.6	176	F	Yes	39	49	IA	IA	Nil	Nil
N26	14/09/2026 22:57	2.2	359	D	Yes	35	45	IA	IA	Nil	Nil

Notes: 1 Noise limits are applicable if weather conditions were within parameters specified in Section 2.5. Criterion may or may not apply due to rounding of meteorological data values.

2. Site-only $L_{Aeq,15minute}$ includes modifying factor penalties, if applicable.

3. Site-only $L_{A1,1minute}$ based on measured site-only L_{Amax} as detailed in Section 3.2.

4. Degrees magnetic north. "-" indicates calm conditions.

4.2.3 EPL monitoring results

Noise limits are applicable under all weather conditions but are adjusted during very noise-enhancing meteorological conditions as defined by the NPfI.

Table 4.4 Site noise levels and EPL limits – September 2026

Location	Start date and time	Wind		Stability class	Very enhancing? [1]	EPL limits, dB		Site levels, dB [2,3]		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N01	15/09/2026 00:11	0.9	333	F	No	37	47	IA	IA	Nil	Nil
N16	15/09/2026 00:57	0.5	82	F	No	35	45	IA	IA	Nil	Nil
N20A	14/09/2026 23:57	0.9	313	F	No	35	45	IA	IA	Nil	Nil
N21	15/09/2026 00:36	0.6	176	F	No	39	49	IA	IA	Nil	Nil
N26	14/09/2026 22:57	2.2	359	D	No	35	45	IA	IA	Nil	Nil

Notes:
1. Noise limits are adjusted by +5 dB during 'very enhancing meteorological conditions' in accordance with the NPfI.
2. Site-only $L_{Aeq,15minute}$ includes modifying factor penalties, if applicable.
3. Site-only $L_{A1,1minute}$ based on measured site-only L_{Amax} as detailed in Section 3.2.
4. Degrees magnetic north. "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. Analysis of 1/3 octave-band environmental noise levels was done at the time of monitoring. From these observations, summaries have been derived for the location and provided in this section. The following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

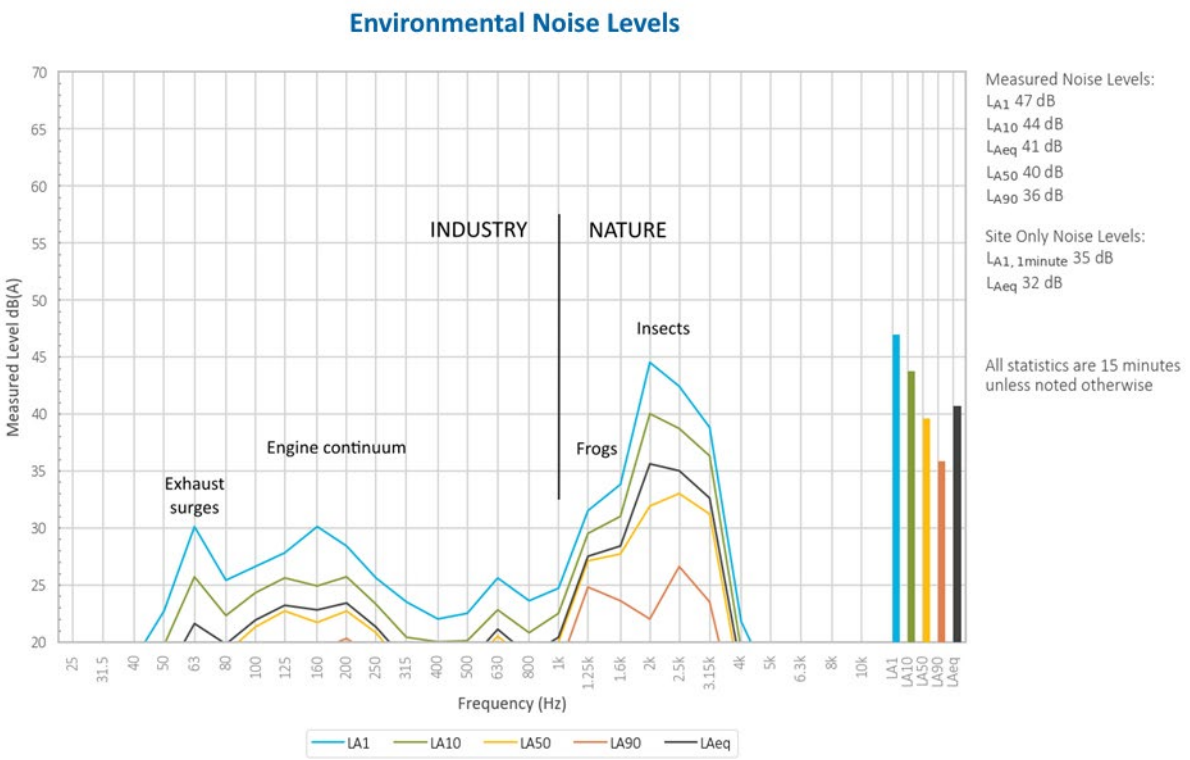

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.1.1 N01

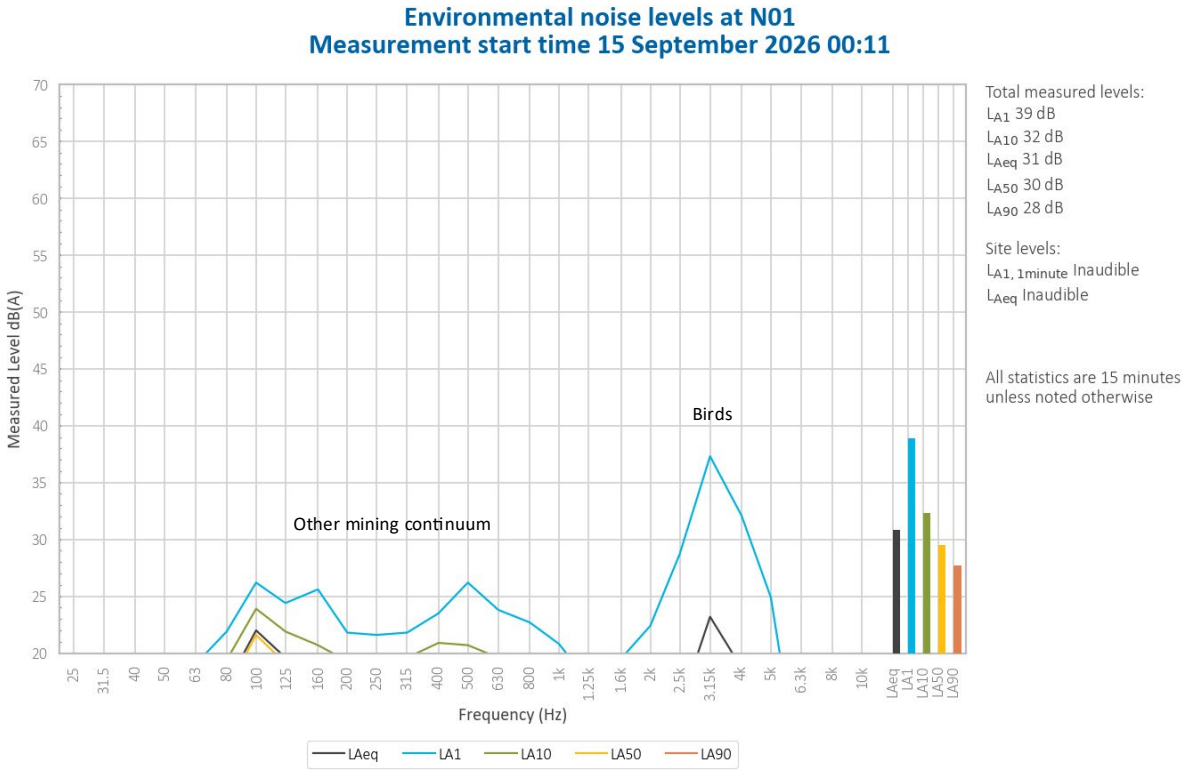

Figure 5.2 Environmental noise levels, N01 – Wambo Road

WCM was inaudible during the measurement.

Birds generated the total measured L_{A1} and contributed to the measured L_{Aeq}. Continuum from other mining operations contributed to the measured L_{Aeq} and was responsible for the measured L_{A10}, L_{A50}, and L_{A90}.

Noise from farming equipment, frogs, insect, livestock, and dogs was also noted.

5.1.2 N16

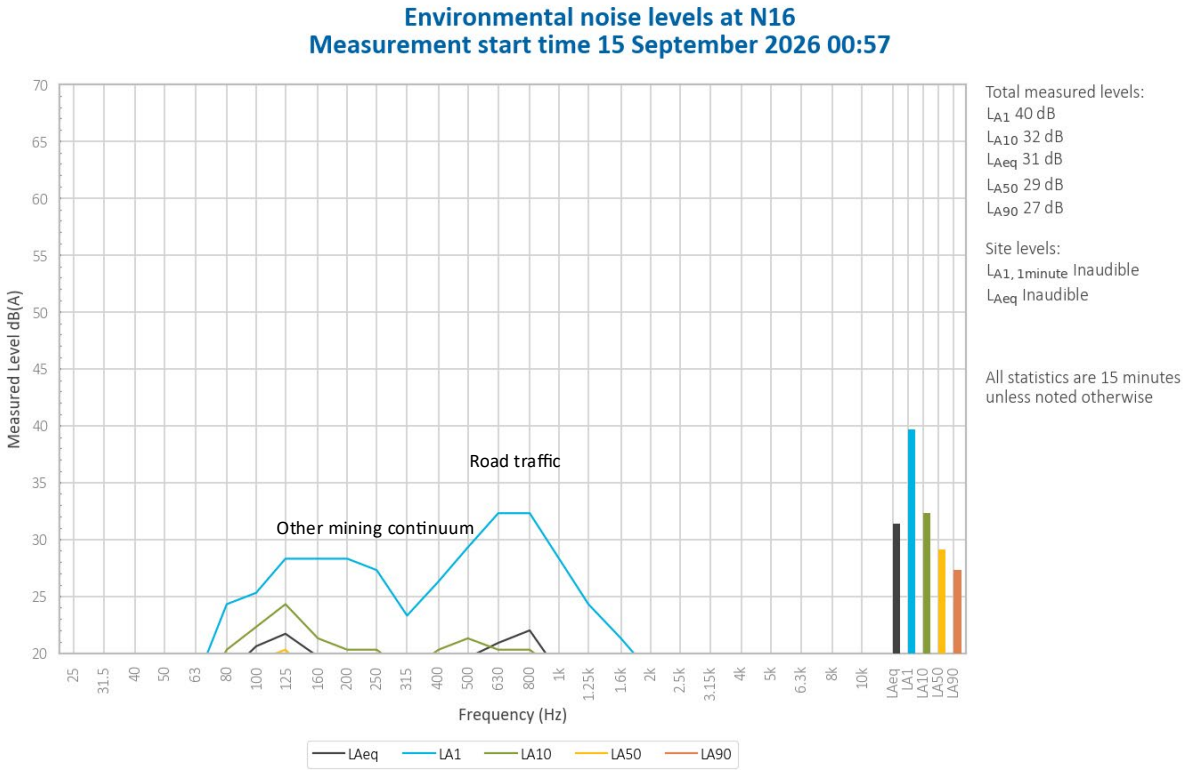

Figure 5.3 Environmental noise levels, N16 – Jerrys Plains Road

WCM was inaudible during the measurement.

Road traffic tyre noise generated the measured L_{A1} and contributed to the measured L_{A10} and L_{Aeq}. Continuum from another mining operation contributed to the measured L_{A10} and L_{Aeq} and generated the measured L_{A50} and L_{A90}.

Noise from frogs, insects, birds, and livestock was also noted.

5.1.3 N20A

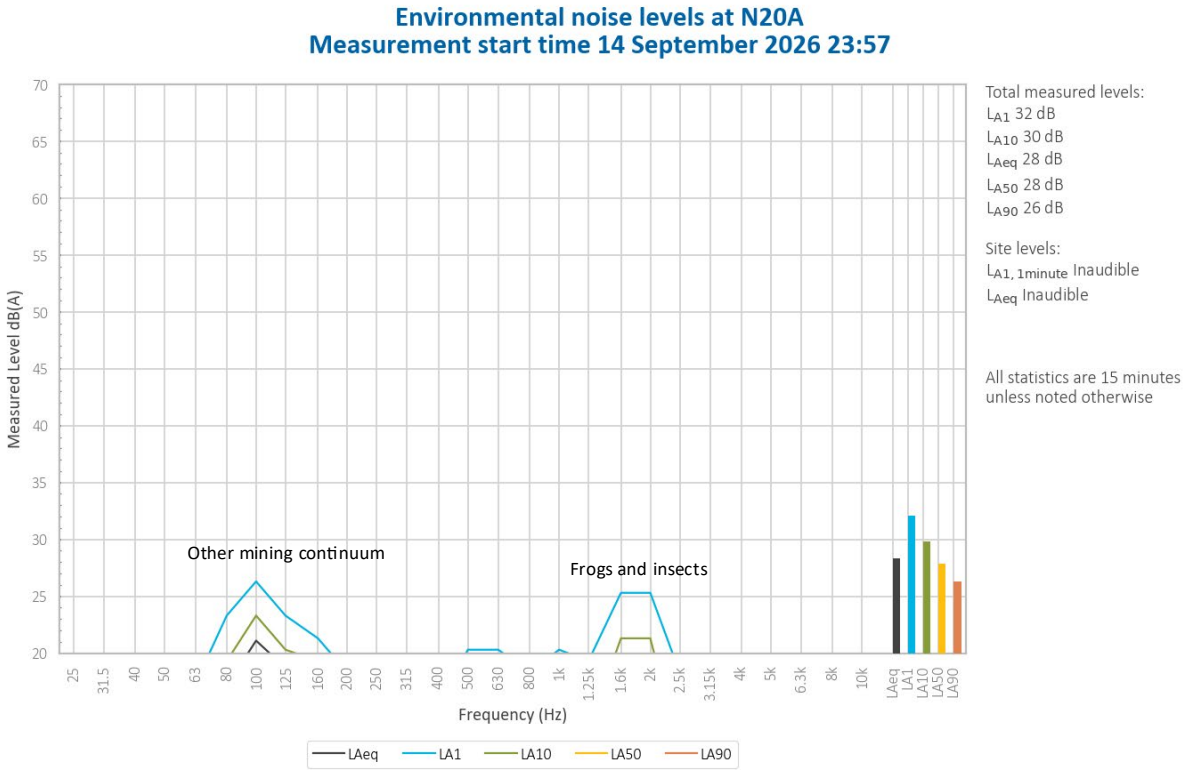

Figure 5.4 Environmental noise levels, N20A – Redmanvale Road Central

WCM was inaudible during the measurement.

Other mining continuum, frogs, and insects generated total measured levels.

Noise from birds was also noted.

5.1.4 N21

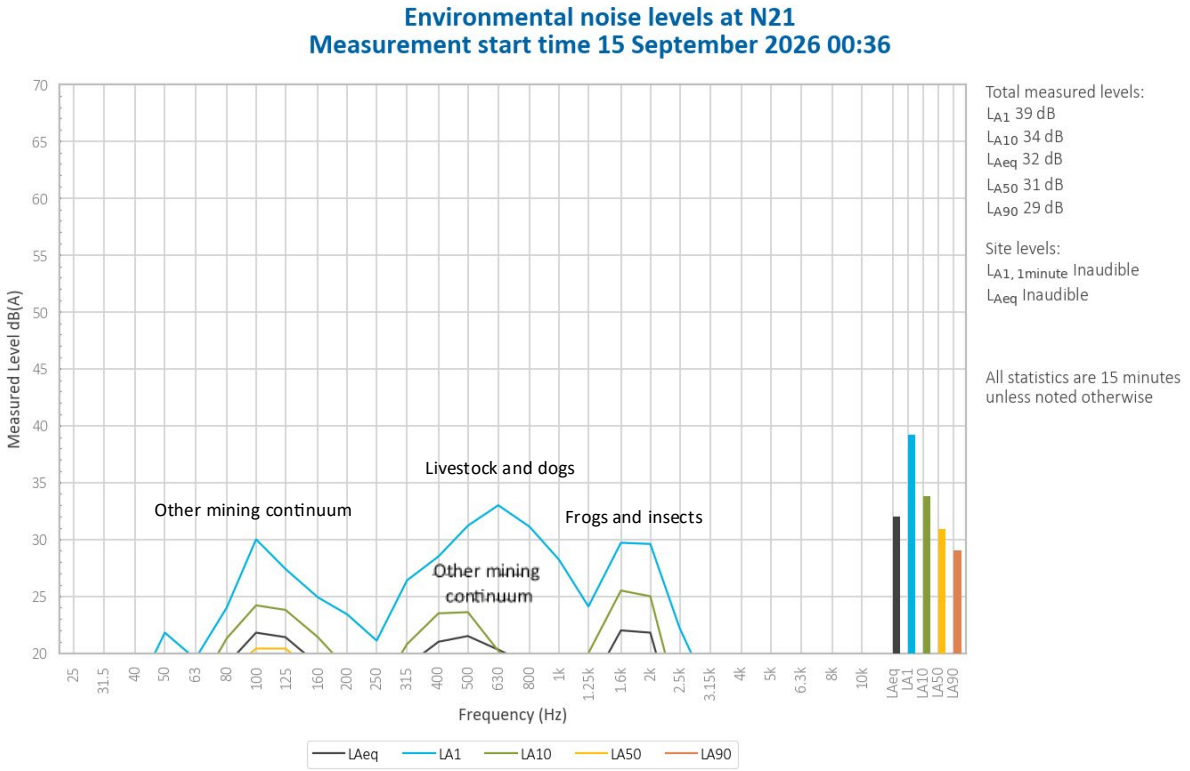

Figure 5.5 Environmental noise levels, N21 – Wambo South

WCM was inaudible during the measurement.

Livestock and dogs were primarily responsible for the measured L_{A1}. Continuum from another mining operation, frogs, and insects contributed to the measured L_{A1} and generated the measured L_{A10}, L_{Aeq}, L_{A50}, and L_{A90}.

5.1.5 N26

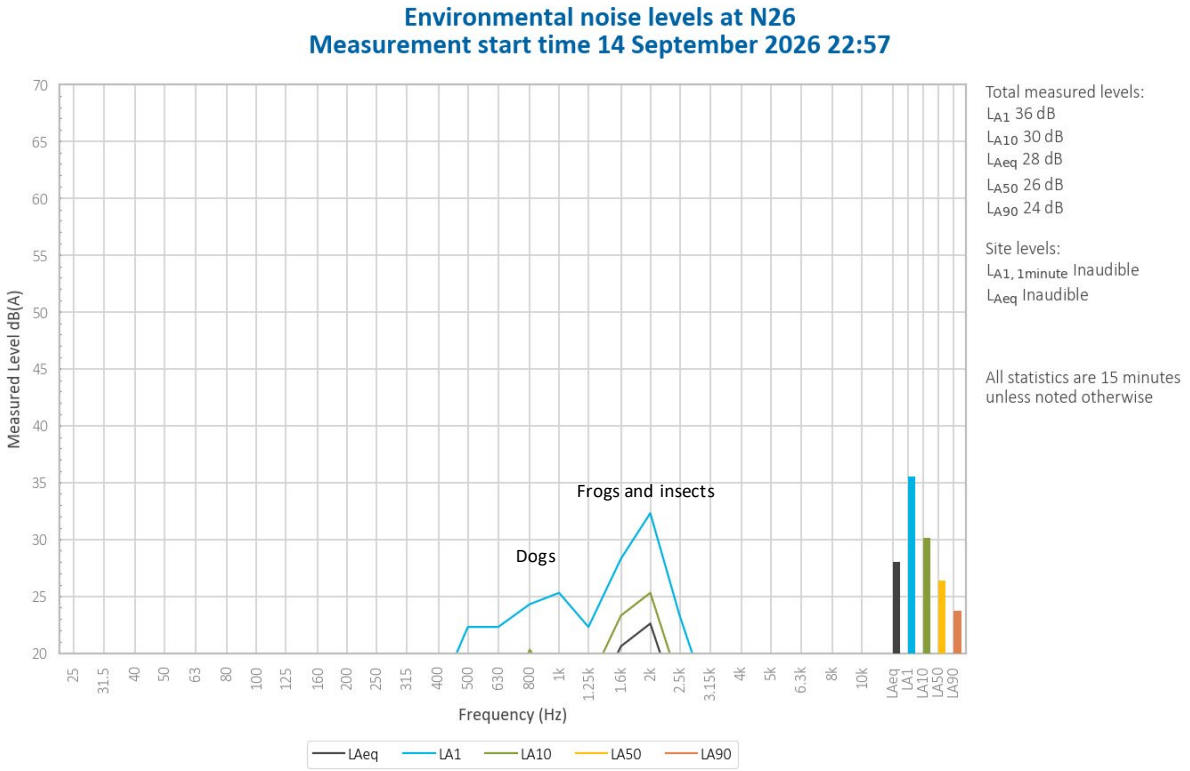

Figure 5.6 Environmental noise levels, N26 – Redmanvale Road South

WCM was inaudible during the measurement.

Frogs and insects were primarily responsible for total measured levels. Continuum from another mining operation contributed to the measured L_{A50} and L_{A90}.

Noise from dogs was also noted.

6 Summary

EMM was engaged by Wambo Coal Pty Limited to conduct a monthly noise survey of operations at WCM and WCRS. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done at five monitoring locations during the night period of 14/15 September 2026.

Noise levels from site complied with relevant limits at all monitoring locations during the September 2026 survey.

Appendix A

Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

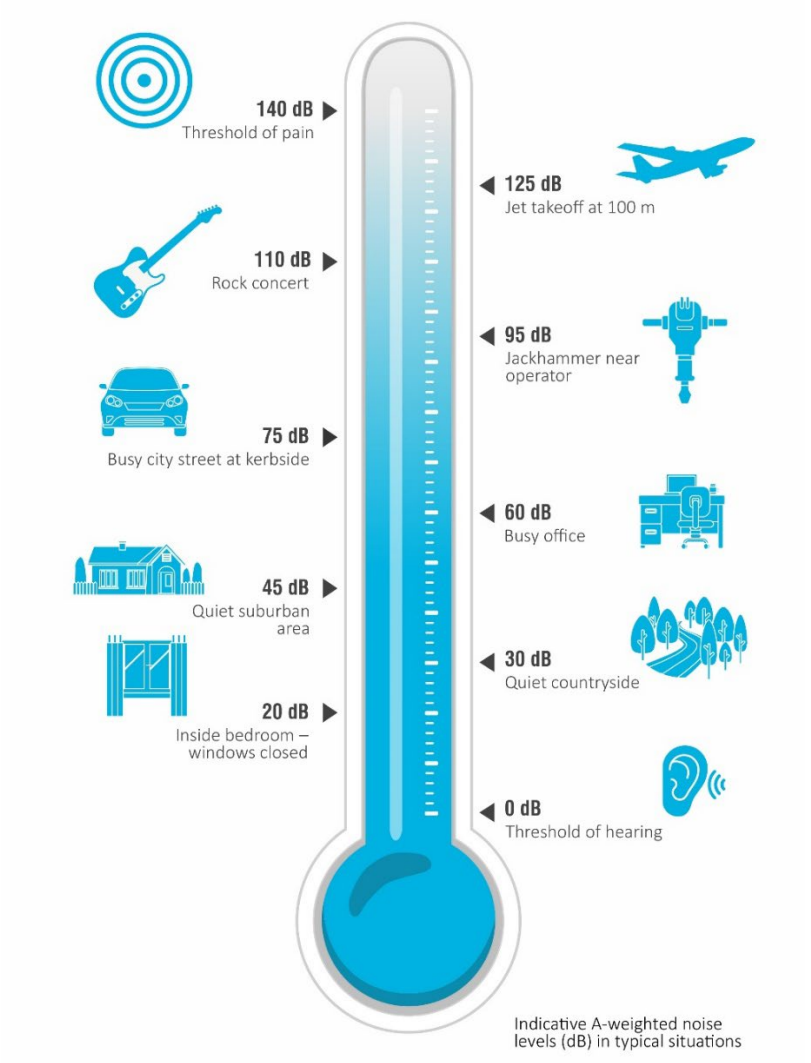

Figure A.1 Common noise levels

Appendix B

Regulator documents

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B.1 Wambo Coal Mine development consent

NOISE

Operational Noise Criteria

B12. During Phase 1, the Applicant must ensure that the noise generated by the Wambo Mining Complex does not exceed the criteria in Table 3 at any residence[a] on privately-owned land.

Table 3: Operational noise criteria dB(A) for Phase 1

Noise Assessment Location	Day $L_{Aeq\ (15\ min)}$	Evening/Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$
R016	40	40	50
R025			
R029			
R033			
R320 (previously 15B)			
R345 (previously 15B)			
R006	39	39	50
R007			
R048			
R343 (previously 37)			
R030 (previously 38)	38	38	50
R049			
R075			
R346			
R348			
R163	37	37	50
R344 (previously 137)			
All other privately-owned residences	35	35	50

[a] *The Noise Assessment Locations referred to in Table 3 are shown in Appendix 4.*

B13. During Phase 2 and Phase 3, the Applicant must ensure that the noise generated by the Wambo Mining Complex does not exceed the criteria in Table 4 at any residence[a] on privately-owned land.

Table 4: Operational noise criteria dB(A) for Phase 2 and Phase 3

Noise Assessment Area	Noise Assessment Location	Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$
Area 1 - North Bulga	R007	37	37	37	47
	All other privately-owned residences	35	35	35	45
Area 2 - South Wambo	R025	39	39	39	49
	All other privately-owned residences	35	35	35	45
Area 3 - Warkworth Village	All other privately-owned residences	44	44	43	53
All other areas	All privately-owned residences	35	35	35	45

[a] *The Noise Assessment Areas referred to in Table 4 are shown in Appendix 4.*

B14. Noise generated by the Wambo Mining Complex must be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the *NSW Industrial Noise Policy* (EPA, 2000). Appendix 5 of this consent sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

B15. The noise criteria in Table 3 and Table 4 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Noise Operating Conditions

B16. The Applicant must:

(a) take all reasonable steps to minimise all noise from construction and operational activities, including low frequency and other audible characteristics, as well as road noise associated with the development;

(b) monitor and record all major equipment use and make this data readily available at the request of the Department or the EPA;

(c) operate a noise management system commensurate with the risk of impact to ensure compliance with the relevant conditions of this consent;

(d) take all reasonable steps to minimise the noise impacts of the development during noise-enhancing meteorological conditions when the noise criteria in this consent do not apply (see Appendix 5); and

(e) carry out regular attended noise monitoring (at least once a month, unless otherwise agreed by the Planning Secretary) to determine whether the development is complying with the relevant conditions of this consent.

Noise Management Plan

B17. The Applicant must prepare a Noise Management Plan for the Wambo Mining Complex to the satisfaction of the Planning Secretary. This plan must:

(a) be prepared by a suitably qualified and experienced person/s;

(b) be prepared in consultation with the EPA;

(c) describe the measures to be implemented to ensure:

(i) compliance with the noise criteria and operating conditions in this consent;

(ii) best practice management is being employed; and

(iii) noise impacts of the development are minimised during noise-enhancing meteorological conditions under which the noise criteria in this consent do not apply (see Appendix 5);

(d) seek to minimise road traffic noise generated by employee commuter vehicles on public roads;

(e) describe the noise management system in detail; and

(f) include a monitoring program that:

(i) uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the development;

(ii) includes a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results over time;

(iii) adequately supports the noise management system; and

(iv) includes a protocol for distinguishing noise emissions between the Wambo Mining Complex and United Wambo open cut coal mine; and

(v) includes a protocol for identifying any noise-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of any such event.

B18. The Applicant must not commence Phase 2 until the Noise Management Plan is approved by the Planning Secretary.

B19. The Applicant must implement the Noise Management Plan as approved by the Planning Secretary.

APPENDIX 5 NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in condition B12 are to apply under all meteorological conditions except the following:

   (a) where 3°C/100 metres (m) lapse rates have been assessed, then:

   (i) wind speeds greater than 3 metres/second (m/s) measured at 10m above ground level;

   (ii) temperature inversion conditions between 1.5°C and 3°C/100m and wind speeds greater than 2m/s measured at 10m above ground level; or

   (iii) temperature inversion conditions greater than 3°C/100m.

   (b) where Pasquill Stability Classes have been assessed, then:

   (i) wind speeds greater than 3m/s at 10m above ground level;

   (ii) stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level;

   (iii) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station required under condition B50.

Compliance Monitoring

3. Unless otherwise agreed by the Planning Secretary, this monitoring must be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (EPA, 2000), in particular the requirements relating to:

   (a) monitoring locations for the collection of representative noise data;

   (b) meteorological conditions during which collection of noise data is not appropriate;

   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and

   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration,

   with the exception of applying appropriate modifying factors for low frequency noise during compliance testing. This should be undertaken in accordance with Fact Sheet C of the *NSW Noise Policy for Industry* (EPA, 2017).

B.2 Wambo Rail Spur development consent

PART B SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Operating Conditions

B1. The Applicant must:

(a) take all reasonable steps to minimise all noise associated with the development, including during noise-enhancing meteorological conditions;

(b) operate a noise management system commensurate with the risk of impact to ensure compliance with the relevant conditions of this consent;

(c) only use locomotives and rolling stock that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL and use reasonable endeavours to ensure that rolling stock is selected to minimise noise;

(d) use all reasonable efforts to co-ordinate noise management on the site with the noise management at Wambo mine; and

(e) carry out regular attended noise monitoring to determine whether the development is complying with the relevant conditions of this consent.

B.3 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The noise limits in the table below represent the noise contribution from the premises.

Receiver Land Number	Day LAeq(15 minute)	Evening LAeq(15 minute)	Night LAeq(15 minute)	Night LA1(1 minute)
EPA Point 20 in NMG1	40	40	40	50
EPA Point 21 in NMG2	40	40	40	50
EPA Point 22 in NMG3	40	40	40	50
EPA Point 23 in NMG4	38	38	38	50
Residence 019	59	59	59	
Residence 003 and 025 in NMG3	40	40	40	50
Residence 016 and 039 in NMG1	40	40	40	50
Residence 029, 042 and 345 in NMG4	40	40	40	50
Residence 033 and 320 in NMG2	40	40	40	50
Residence 006 and 007 in NMG3	39	39	39	50
Residence 048 and 343	39	39	39	50
Residence 017 in NMG1	38	38	38	50
Residence 030, 035, 049, 075 and 379	38	38	38	50
Residence 346 and 348 in NMG4	38	38	38	50
Residence 344 in NMG2	37	37	37	50
Residence 043, 163, 380 and 381	37	37	37	50
All other privately owned residences in Appendix 4 of DA 305-7-2003 29 August 2019	35	35	35	50

L5.2 For the purpose of condition L5.1:
a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
b) Evening is defined as the period from 6pm to 10pm; and
c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above the ground level;
b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10

metres above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purposes of condition L5.3:

a) Data recorded by the closest and most representative meteorological station installed on the premises at identification Point 17 must be used to determine meteorological conditions; and
b) Temperature inversion conditions (stability category) are to be determined by the methods referred to in Fact Sheet D of the Noise Policy for Industry (2017).

Note: For the purposes of condition L5.1:

- Noise receiver locations and associated noise limits are defined in Appendix 4 of development consent DA 305-7-2003 dated 29 August 2019 (EPA ref. DOC19/1117963).

- Noise monitoring groups (NMG) are defined in the document titled *'Wambo Coal Mine Noise Monitoring Groups Noise Modelling Evaluation'* dated 16 August 2019 (EPA ref. DOC19/704212).

B.4 Noise management plan

5.0 Noise Monitoring Program

5.1 Attended Noise Monitoring

WCPL attended noise monitoring is carried out monthly. The monitoring is conducted by a WCPL appointed acoustic specialist who measures and describes the acoustic environment at each attended monitoring location. The attended noise monitoring results are compared with noise impact assessment criteria (as defined in **Section 3.1**) to assess compliance. Attended noise monitoring is considered the preferred method for determining compliance with prescribed limits because it allows for an accurate determination of the contribution, if any, made by industrial noise sources to measured ambient noise levels.

Operator attended noise measurements are conducted during night period[3] operations to quantify noise emissions from WCPL as well as the overall level of ambient noise.

Noise levels (LA_{max} and LA_{eq}) from the Mine are quantified over a 15 minute measurement period. In addition, the overall levels of ambient noise (i.e. LA_{max}, LA_1, LA_{10}, LA_{50}, LA_{90}, and LA_{eq}) over the 15 minute period will be quantified and characterised.

Attended noise monitoring will be conducted at a representative location in accordance with the NPfI and Australian Standard AS 1055 '*Acoustics, Description and Measurement of Environmental Noise*'.

Attended noise monitoring is undertaken at five locations as shown in **Table 5**. The attended noise monitoring network locations have been strategically chosen to provide sufficiently appropriate noise monitoring coverage (refer to **Figure 3**).

Table 5: Attended Noise Monitoring Locations

Noise Assessment Area*	Site Ref	EPL529 ID	Description	Approximate Co-ordinates (MGA 94, z56)		Representative Addresses
				Easting	Northing	
1	N01	N/A	North Bulga	313352	6388696	6, 7
2	N21	22	South Wambo	310586	6390149	25
-	N16	20	Jerrys Plains Road	306000	6399785	Privately owned residences near Jerry's Plains
-	N20A	21	Redmanvale Road Central	304666	6399100	Privately owned residences near Jerry's Plains
-	N26	23	Redmanvale Road South	304172	6398160	Privately owned residences near Jerry's Plains

Notes for Table 5
* The Noise Assessment Areas are shown on Figure 3

Measurement of rail pass-by noise levels was removed from the monitoring program in Version 5 of the NMP, following a demonstrated history of compliance. Monitoring will be recommenced if triggered by complaint or change in rolling stock used to transport coal from WCPL.

Meteorological data from the WCPL meteorological station will be utilised to correlate atmospheric parameters and measured noise levels. Ground level atmospheric condition measurement is also undertaken during attended monitoring. Noise criteria only apply in meteorological conditions specified in the conditions. A detailed Compliance Assessment Methodology has been developed to determine the individual noise contributions of the separate United Wambo and Wambo operations (**Section 6.1**).

Modifying factors will be assessed in accordance with the NPfI.

Appendix C

Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: SLM51832

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: Rion
Type No: NA-28 **Serial No:** 00370304
Mic. Type: UC-59 **Serial No:** 10421
Pre-Amp. Type: NH-23 **Serial No:** 60313

Filter Type: 1/3 Octave **Test No:** F051834

Owner: EMM Consulting
Suite 01, 20 Chandos St
St Leonards NSW 2065

Tests Performed: IEC 61672-3:2013 & IEC 61260-3:2016

Comments: All Test passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	993	hPa ±1 hPa	**Date of Receipt :**	05/11/2024
Temperature	24	°C ±1° C	**Date of Calibration :**	08/11/2024
Relative Humidity	47	% ±5%	**Date of Issue :**	08/11/2024

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: .....

AUTHORISED SIGNATURE: .....
Bruce Meldrum

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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