

BALRANALD MINERAL SANDS MINE

Quarterly Noise Monitoring Report

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TERMINOLOGY AND ABBREVIATIONS

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.

Table 1 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.
LA90	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 micro-Pascals.
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, there was no discernible site noise contribution above ambient noise sources.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday–Saturday: 7:00 am to 6:00 pm, on Sundays and public holidays: 8:00 am to 6:00 pm.
Evening	Monday–Saturday: 6:00 pm to 10:00 pm, on Sundays and public holidays: 6:00 pm to 10:00 pm.
Night	Monday–Saturday: 10:00 pm to 7:00 am, on Sundays and public holidays: 10:00 pm to 8:00 am.



EXECUTIVE SUMMARY

This quarterly environmental noise monitoring report has been prepared in accordance with Development Consent SSD-5285 (Consolidated), NSW Environment Protection Licence (EPL) 20795, AS 1055:2018 *Acoustics – Description and Measurement of Environmental Noise* Standard, and with the *NSW Noise Policy for Industry (EPA, 2017) (NPfI)*.

Attended noise monitoring was conducted on 18, 19 and 30 March 2026 during daytime, evening and night periods at three EPL monitoring locations (EPL IDs 14, 15, and 16), and) representing the nearest noise-sensitive receivers.

During the monitoring period, site activities included construction and commissioning works, drilling operations within active mining panels, and vehicle movements along access and internal haul roads.

Measured noise levels at all monitoring locations were dominated by typical rural ambient sources, including fauna, wind-induced vegetation noise and intermittent local traffic. Noise attributable to Balranald Mine was not audible and could not be distinguished from the ambient acoustic environment at any monitoring location during the survey period. Where site noise was not audible, any potential contribution is considered to be below measurable or distinguishable levels and/or masked by ambient noise sources.

All assessed site-only noise levels were compliant with applicable EPA noise criteria under both standard and very noise-enhancing meteorological conditions. In accordance with the NPfI, noise criteria were increased by 5 dB during periods classified as very noise-enhancing (Stability Classes E and F). Compliance was maintained under all conditions.

No modifying factors (tonal, impulsive or low-frequency characteristics) attributable to site operations were identified.

Overall, the monitoring results demonstrate that Balranald Mine operates in full compliance with EPL 20795 and relevant regulatory requirements, with no exceedances recorded during the reporting period.

Attended noise monitoring will continue on a quarterly basis in accordance with EPL requirements.

1. INTRODUCTION

1.1 Purpose and scope

On **18, 19 and 30 March 2026** quarterly attended noise monitoring were completed at three monitoring locations at the nearest sensitive receivers located Balranald Mine. The purpose of the monitoring was to quantify the acoustic environment and compare site noise levels against specified limits in *Condition L3 Noise Limits* of the EPL 20795.

1.2 Attended noise monitoring locations

Site monitoring locations are detailed in Table 1 and shown on Figure 1. It should be noted that Figure 1 shows actual monitoring positions, not necessarily the location of residences.

Table 1 - Attended noise monitoring locations

Mine Location Descriptor	EPL Monitoring Point No. ID	Description	Coordinates (MGA 54)	
			Easting	Northing
BN1	14	Adjacent Balranald-Ivanhoe Road (R54 & R57)	737482	6172117
BN2	15	Burke and Wills Road (R2)	726679	6196614
BN3	16	Cringadale/Karra boundary (R362)	716208	6187677

1.3 Mine site activities

Construction activities were restricted during the day period. Mining development activities continued 24/7 hours of operation at the mining panels. Commissioning activities continued throughout 1Q - 2026.

The following are the activities at the time of the monitoring period:

Table 2 – Mine site activities occurring during the noise monitoring survey on 10 & 11 December 2025

Site activity	Plant/Equipment	Period of Operation		
		Day	Eve	Night
Civil construction works at the remaining sections of the processing plant and HMC hardstand areas, internal haul road	generators, water trucks, excavators, forklift,	✓		
Vegetation clearing and disturbance earthworks for the mining pits, the future fence at the HMC storage area, and the Solar Farm dust suppression polymer application, construction of the permanent power plant	Bulldozers, excavators, scrapers, water trucks	✓		
Vehicle movements (external) for site deliveries (~ 18 to 20 trucks per day)	Delivery trucks, fuel tanker truck, waste vac trucks,	✓		
Drilling works using both development and mining rigs at Mining Panels 1 and 2, drill mud processing at Mud Cities 1 & 2	Drill rig, mining rig, mud city processing plant, generators, water trucks	✓	✓	✓

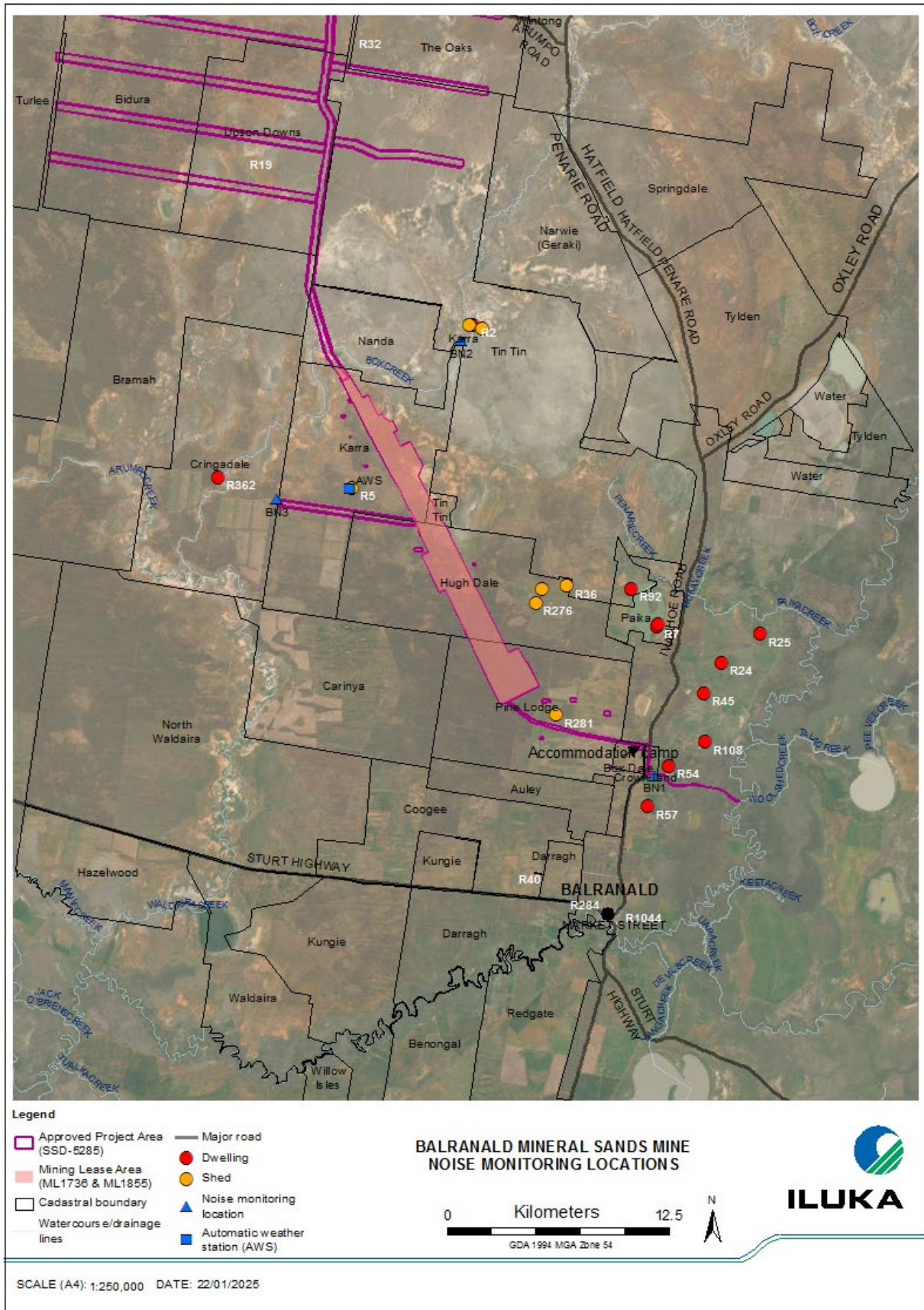


Figure 1 – Balranald Mineral Sands Mine noise monitoring locations

2. STATUTORY NOISE REQUIREMENTS

2.1 Development consent

The current development consent for Balranald Mine is the consolidated Development consent SSD-5285 (MOD 4, July 2025). A copy of the development consent is available on the Iluka Resources' [Balranald Mine Statutory Approvals](#) webpage.

2.2 Environment protection licence

Balranald Mine holds Environment Protection Licence (EPL) No. 20795 issued by the NSW Environment Protection Authority (EPA) on 5 July 2023. A copy of the current EPL is available on both the [NSW EPA POEO Licence Public Register](#) and Iluka Resources' [Balranald Mine Statutory Approvals](#) webpage.

2.3 Noise management plan (NMP)

Noise monitoring requirements are detailed in Balranald Mine Noise Management Plan (NMP). The most recent version of the NMP was prepared in February 2023 and is publicly available via the Iluka Resources' Balranald community webpage: <https://www.iluka.com/community-engagement/balranald/>.

2.4 Noise Assessment Criteria

Noise limit conditions on both Development Consent and EPL state that Iluka Resources must ensure that the noise generated at Balranald Mine does not exceed the noise criteria at the monitoring locations in the Table below.

Table 3 - Noise Criteria measured in decibels (dB(A)) over a 15-minute measurement period

Location / EPL ID	Day	Evening	Night	Night
	L _{Aeq,15minute}	L _{Aeq,15minute}	L _{Aeq,15minute}	L _{A1, 1 minute}
BN1 / EPL ID 14	35	35	35	45
BN2 / EPL ID 15	35	35	35	45
BN3 / EPL ID 16	35	35	35	45
Any residence on privately-owned land	35	35	35	45
Mungo National Park and Mungo State Conservation Area (when in use)	50	50	50	-

It should be noted that while these limits relate to operational noise from the mine,

- these have also been adopted for the mine's construction phase as a conservative measure; and
- may be exceeded if Iluka Resources has an agreement with the owner/s or leaseholders to permit generation of higher noise levels.

2.5 Monitoring and reporting requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) (October 2017) and the *Approved methods for the measurement and analysis of environmental noise in NSW* (Approved Methods) (January 2022).

2.6 Meteorological conditions

Realtime meteorological monitoring is captured at Balranald Mine's Automatic Weather Station (AWS) which complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* (NSW EPA, 2022) guideline.

The EPL noise limit conditions apply under all meteorological conditions except:

- during rain and wind speeds (at 10m height) greater than 3m/s; and
- under "non-significant weather conditions".

Based on the initial noise impact assessment prepared for SSD-5285, it has been assumed as a conservative measure that noise limits apply under all meteorological conditions except during rainfall and/or wind speeds greater than 3 metres/second (m/s) at 10 metres above ground level (m AGL).

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 quarterly noise monitoring occurs during meteorological conditions outside of those specified in Section 2.6 above, then site limits shall be adjusted based on Table 2 in Section 2.4 **plus 5 dB**.

3. METHODOLOGY

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS 1055 *Acoustics, Description and Measurement of Environmental Noise* and relevant NSW EPA requirements.

Meteorological data was obtained from the site automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended Noise Monitoring

During this monitoring survey, attended noise monitoring was conducted during the day, evening and night periods 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 $L_{Aeq,15\text{minute}}$ and L_{Amax} were measured directly or determined by other methods detailed in [Section 7.1 of the NPfl](#).

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this Report, i.e.

- 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.

In practice, where site noise is classified as IA, this indicates that any potential site contribution was below the level at which it could be distinguished from ambient noise sources and is typically at least approximately 10 dB below background levels.

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 to 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 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 $L_{A1,1\text{minute}}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1\text{minute}}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Instrumentation and personnel

Attended noise monitoring was conducted by Balranald Mine Staff Chrissie Eckersley (Environmental Advisor) and Andrew Rogers (Environmental Technician).

Equipment used to measure environmental noise levels is detailed in the Table 3 below.

Table 4 – Equipment used for attended noise monitoring

Equipment / Model	Serial Number	Calibration due date	Relevant Standard
Rion NL-53EX sound level meter	440941	9/07/2026	IEC 61672-3:2013
Rion NC-75 noise meter sound calibrator	34645810	03/09/2026	IEC 60942:2017
Rion NX-43RT octave band filter	n/a	18/07/2026	IEC 61260-3:2016
Kestrel anemometer 5200 Professional	247196	n/a	n/a
WS-10 windscreen	n/a	n/a	n/a
Microphone extension cable	n/a	n/a	n/a
Sound level meter tripod	n/a	n/a	n/a

4. MONITORING 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 below. It should be noted that the total measured noise levels in Table 4 are not necessarily the result of activities at Balranald Mine.

Atmospheric condition data measured by the operators during each measurement using a hand-held weather meter (Kestrel) is also shown in Table 4. The wind speed, direction and temperature were measured at approximately 1.3 to 1.5 metres above ground.

Attended noise monitoring was not done during rain, hail, or wind speeds above 5 m/s at microphone height.

4.2 Site only noise levels and atmospheric data from the AWS

Table 5 provides site noise levels in the absence of other sources, where possible, and includes weather data from the site Automatic Weather Station (AWS) (see Figure 1 above) measured at an altitude of 10 meters above ground level (AGL).

Noise limits presented in Table 5 are applicable under all weather conditions but are adjusted, where required, during very noise-enhancing weather conditions as defined by the NPfl.

Table 5 - Total measured noise levels in dB(A) and atmospheric conditions during the 15-min attended noise assessment 1Q 2026

EPL ID / Location	Date & Time	MONITORING LOCATION WEATHER CONDITIONS AT 1.5 m ABOVE GROUND LEVEL (mAGL)				TOTAL MEASURED NOISE LEVELS						
		Temp (°C)	Wind		Cloud Cover	L _{Aeq}	L _{Amax}	L _{A1}	L _{A10}	L _{A50}	L _{A90} (Background Level)	L _{Amin}
			Direction (°magnetic N)	Speed (m/s)								
PERIOD	DAY											
14 / BN1	18/03/2026 15:11	24.7	135	2.1	8/8	36.2	49.3	41.8	38.3	35.4	33.1	29.1
15 / BN2	19/03/2026 9:57	21.5	182	1.6	7/8	25.2	41.8	33.9	27.7	22.9	20.7	18.9
16 / BN3	18/03/2026 13:20	23.4	120	2.8	7/8	33.2	44.3	38.4	35.9	32.2	28.5	25.6
PERIOD	EVENING											
14 / BN1	30/03/2026 21:14	18.4	n/a	0	0/8	30.9	41	34.4	32.9	30.5	28.6	25.4
15 / BN2	30/03/2026 20:12	20.9	88	0.2	0/8	20.1	35.5	22.5	20.8	19.9	19.1	17.9
16 / BN3	30/03/2026 18:51	27.3	63	1.6	0/8	22.3	39.3	26.7	23.7	21.7	20.4	18.9
PERIOD	NIGHT											
14 / BN1	30/03/2026 4:15	13.6	-	0	1/8	28	45.5	40.5	27.5	22.7	21.1	19.2
15 / BN2	30/03/2026 5:03	13.5	-	0	1/8	26.1	58.7	34.3	17.8	17.1	17	16.6
16 / BN3	30/03/2026 5:58	13.9	-	0	1/8	18.3	31.7	21.5	18.9	17.9	17.4	16.9

OKTA	Description	Approx % sky covered	OKTA	Description	Approx % sky covered	OKTA	Description	Approx % sky covered
0	Clear sky	0%	3	Partly cloudy	37.5%	6	Mostly cloudy	75%
1	Few clouds	12.5%	4	Partly cloudy	50%	7	Overcast	87.5%
2	Few clouds	25%	5	Mostly cloudy	62.5%	8	Completely overcast	100%

Table 6 – Balranald Mine ‘site only’ noise levels field results and monitoring data from the site weather station (1Q 2026)

EPL ID / Location	Date & Time	METEOROLOGICAL DATA (from Site Weather Station) AT 10 m ABOVE GROUND LEVEL (mAGL)					EPA NOISE CRITERIA (dB) ¹		SITE ONLY (POA) NOISE LEVELS (dB)		MEASURED BACKGROUND L _{A90}	RESULT
		10 mAGL	Wind 10 mAGL		Stability Class	Very Enhancing?	L _{Aeq}	L _{Amax}	L _{Aeq} ²	L _{Amax}		
		Temp (°C)	Direction (°magnetic N) ³	Speed (m/s)								
PERIOD	DAY											
14 / BN1	18/03/2026 15:11	25.35	175.26	3.01	D	No	35	n/a	34.4	n/a	33.1	Compliant
15 / BN2	19/03/2026 9:57	20.59	181.71	1.37	D	No	35	n/a	19.5	n/a	20.7	Compliant
16 / BN3	18/03/2026 13:20	22.52	153.3	3.27	D	No	35	n/a	32.5	n/a	28.5	Compliant
PERIOD	EVENING											
14 / BN1	30/03/2026 21:14	22.75	102.12	2.41	E	Yes	40	n/a	IA (18.4)	n/a	28.6	Compliant
15 / BN2	30/03/2026 20:12	24.57	102.69	2.59	E	Yes	40	n/a	9.8	n/a	19.1	Compliant
16 / BN3	30/03/2026 18:51	26.5	102.25	1.67	E	Yes	40	n/a	12.8	n/a	20.4	Compliant
PERIOD	NIGHT											
14 / BN1	30/03/2026 4:15	15.16	86.48	0.73	F	Yes	40	50	26.6	43.8	21.1	Compliant
15 / BN2	30/03/2026 5:03	14.21	206.41	0.78	F	Yes	40	50	8.4	9.5	17.0	Compliant
16 / BN3	30/03/2026 5:58	14.17	133.95	0.99	F	Yes	40	50	12.6	10.6	17.4	Compliant
Notes:	1. Noise limits are adjusted by +5 dB during ‘very noise-enhancing meteorological conditions’ in accordance with the NPfl. 2. Site-only L _{Aeq} ,15minute, includes modifying factor penalties, if applicable. 3. Degrees magnetic north, “-” indicates calm weather conditions.											

5. DATA ANALYSIS AND DISCUSSION

Measured noise levels at EPL monitoring locations 14, 15 and 16 were dominated by typical rural ambient sources, including fauna (birds, and insects), wind-induced vegetation noise, and intermittent local traffic. These sources are characteristic of the receiving environment and did not display intrusive acoustic characteristics.

Assessment of site-only noise levels indicates that noise emissions from Balranald Mine were not audible or were below measurable limits at all monitoring locations during the survey period. Site-only LAeq values were consistently well below both the applicable EPA noise criteria and, in most cases, below the measured background noise levels (LA90).

Meteorological conditions during the evening and night monitoring periods were classified as very noise-enhancing (Stability Classes E and F). In accordance with the NSW Noise Policy for Industry (NPfI), noise criteria were increased by 5 dB under these conditions. Despite this conservative adjustment, all measured site-only noise levels remained substantially below the applicable limits.

No evidence of tonal, impulsive, intermittent or low-frequency characteristics attributable to site operations was identified in the attended monitoring data, including review of octave band and statistical noise descriptors. Furthermore, there was no observable correlation between noise measurements and site activities occurring at the time of monitoring.

Where site noise was not audible, it is inferred that any site contribution was masked by ambient environmental noise sources and/or was below measurable limits at the monitoring locations. Overall, the results demonstrate that no discernible contribution from Balranald Mine could be identified above ambient noise sources during the monitoring period. This outcome is consistent with a scenario where site noise emissions are at least 10 dB below background levels or fully masked by ambient sources, consistent with NPfI assessment principles.

6. CONCLUSION

Based on the attended noise monitoring conducted in 1Q 2026:

- All site-only noise levels at EPL monitoring locations BN1, BN2 and BN3 were compliant with applicable noise criteria specified in Development Consent SSD-5285 and EPL 20795.
- Compliance was achieved under both standard and very noise-enhancing meteorological conditions, with appropriate NPfI adjustments applied.
- Noise from Balranald Mine was not audible or was below measurable or distinguishable levels at any monitoring location during the survey period.
- No modifying factors (tonality, impulsiveness or low-frequency characteristics) were identified.
- The acoustic environment at all monitoring locations was dominated by natural ambient and local rural sources.

Balranald Mine is therefore in full compliance with the NSW Noise Policy for Industry and Approved Methods for the reporting period, and no corrective actions are required.

Attended noise monitoring will continue in accordance with EPL requirements.