Balranald Mineral Sands Project

Environmental noise monitoring

Prepared for Iluka Resources Limited

April 2024

Balranald Mineral Sands Project

Environmental noise monitoring

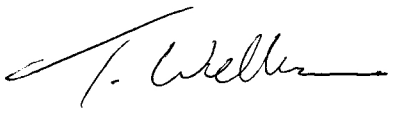
Iluka Resources Limited

E231081 RP2

April 2024

Version	Date	Prepared by	Reviewed by	Comments
1	26 April 2024	Will Tuck	Tony Welbourne	Final

Approved by



Tony Welbourne
Associate Director National Acoustics Leader
26 April 2024

Level 3 175 Scott Street
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Appendices

Tables

Figures

Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table ES1.

Table ES1 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: 7:00 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.

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.

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Iluka Resources Limited to conduct a quarterly noise survey of construction at Balranald Mineral Sands Project (BMS, the site) located near Balranald, 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 during the day, evening and night periods of 19 March 2024 at three monitoring locations.

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 (MGA 54)	
		Easting	Northing
BN1	Adjacent Balranald-Ivanhoe road	737482	6172117
BN2	Burke and Wills road	726679	6196614
BN3	Cringadale/Karra boundary	716208	6187677

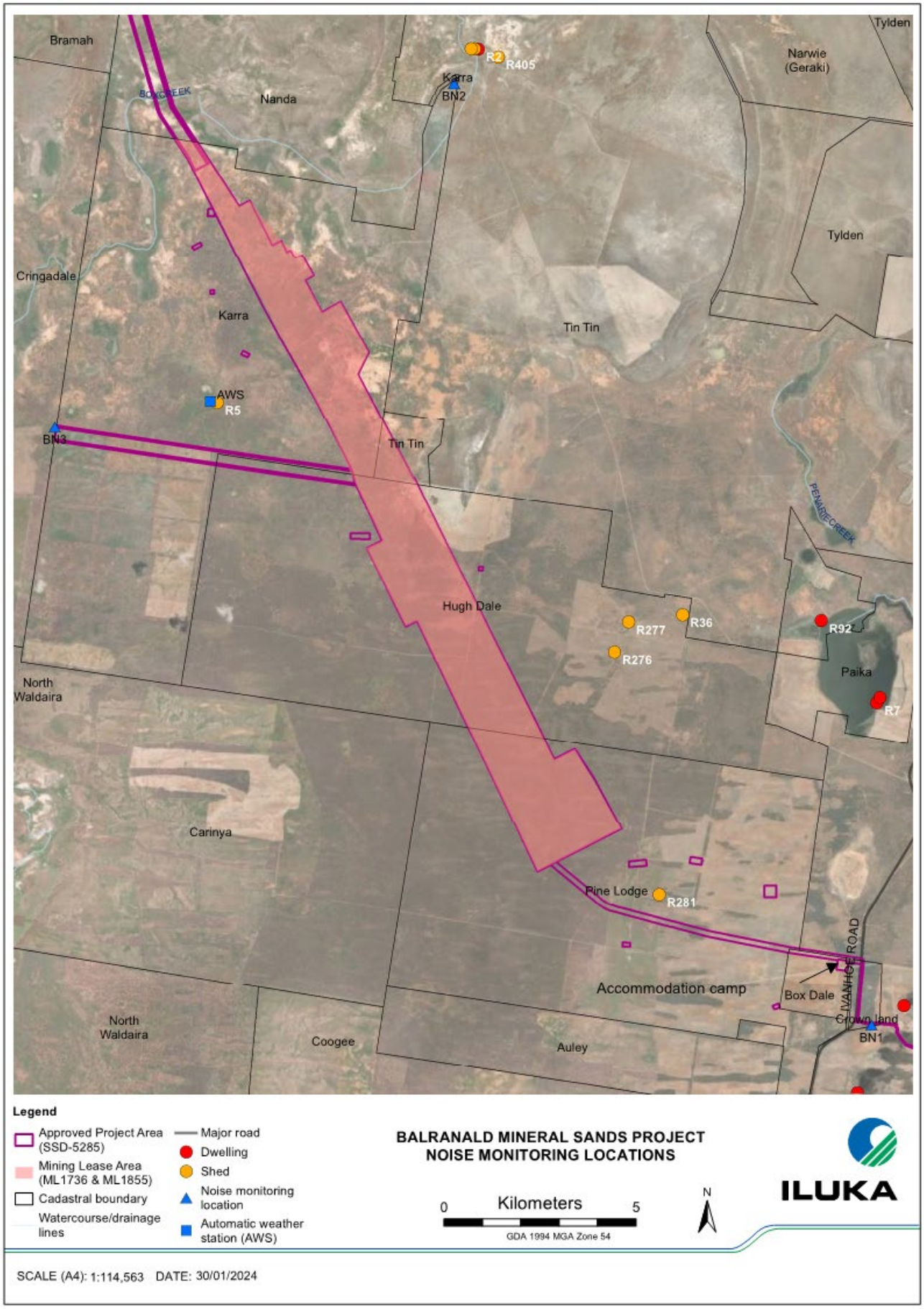

Figure 1.1 Attended noise monitoring locations

2 Noise limits

2.1 Development consent

The current development consent for BMS is SSD-5285 (MOD 2, August 2023). Relevant sections of the development consent are reproduced in Appendix B.1.

2.2 Environment protection licence

BMS holds Environmental Protection License (EPL) No. 20795 issued by the Environment Protection Authority (EPA) on 5 July 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in BMS Noise Management Plan (NMP). The most recent version of the NMP was prepared in February 2023. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the development consent and EPL are provided 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 $L_{A1,1minute}$
BN1	35	35	35	45
BN2	35	35	35	45
BN3	35	35	35	45

2.5 Meteorological conditions

As detailed in the NMP, noise limits apply under all meteorological conditions except the following:

a) wind speeds greater than 3 m/s at 10 m above ground level, or

b) stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 m above ground level, or

c) temperature inversion conditions greater than 8 °C/100 m.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the '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 Nois*' 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 survey, attended noise monitoring was conducted during the day/evening/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 $L_{Aeq,15minute}$ 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 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 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 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} levels 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.

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Tuck. 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 Measurement equipment

Item	Serial number	Calibration due date	Relevant standard
B&K 2250 sound level meter	3029726	08/09/2025	IEC 61672-1:2013
B&K 4231 acoustic calibrator	3026661	08/09/2024	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.

Table 4.1 Total measured noise levels, dB – Quarter 1 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
BN1	19/03/2024 09:25	63	50	42	39	34	31	28
BN1	19/03/2024 19:09	56	45	42	41	41	40	38
BN1	20/03/2024 00:03	53	44	42	40	40	37	36
BN2	19/03/2024 08:35	60	39	31	30	24	20	17
BN2	19/03/2024 20:05	65	35	29	30	23	20	18
BN2	19/03/2024 23:11	64	58	53	50	47	41	34
BN3	19/03/2024 07:42	59	50	38	38	31	25	21
BN3	19/03/2024 21:07	59	49	43	40	38	36	34
BN3	19/03/2024 22:20	67	52	45	43	41	37	34

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

Table 4.2 Measured atmospheric conditions – Quarter 1 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction ° magnetic north [1]	Cloud cover 1/8s
BN1	19/03/2024 09:25	28	2	15	1
BN1	19/03/2024 19:09	26	1.1	210	6
BN1	20/03/2024 00:03	21	2.8	220	8
BN2	19/03/2024 08:35	25	0.5	250	1
BN2	19/03/2024 20:05	25	1.4	220	6
BN2	19/03/2024 23:11	22	5	220	8
BN3	19/03/2024 07:42	23	0.8	230	4
BN3	19/03/2024 21:07	25	2.3	220	6
BN3	19/03/2024 22:20	24	2.5	220	7

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

4.2 Construction activities

BMS has advised the following construction activities were occurring during the day period of the Quarter 1 2024 noise monitoring survey:

- grader and scraper working on road construction
- tractor scoops for stripping topsoil
- auger boring for power pole installation
- rammers for building fences
- water trucks for dust suppression.

4.3 Site only noise levels

4.3.1 Modifying factors

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

4.3.2 Monitoring results

Table 4.3 provides site noise levels in the absence of other sources, where possible, and includes weather data from the site AWS. Noise limits are applicable under all weather conditions but are adjusted during very noise-enhancing weather conditions as defined by the NPfI.

Table 4.3 Site noise levels and limits – Quarter 1 2024

Location	Start date and time	Wind		Stability class	Very enhancing?	Limits, dB [1]		Site levels, dB		Exceedances, dB [1]	
		Speed m/s	Direction [3]			$L_{Aeq,15minute}$	L_{Amax}	$L_{Aeq,15minute}$ [2]	L_{Amax}	$L_{Aeq,15minute}$	L_{Amax}
BN1	19/03/2024 09:25	2.3	295	A	No	35	-	IA	-	Nil	-
BN1	19/03/2024 19:09	4.1	237	D	Yes	40	-	IA	-	Nil	-
BN1	20/03/2024 00:03	6.2	223	D	Yes	40	50	IA	IA	Nil	Nil
BN2	19/03/2024 08:35	0.9	2	C	No	35	-	IA	-	Nil	-
BN2	19/03/2024 20:05	3.8	240	D	Yes	40	-	IA	-	Nil	-
BN2	19/03/2024 23:11	6.9	223	D	Yes	40	50	IA	IA	Nil	Nil
BN3	19/03/2024 07:42	0.7	19	A	No	35	-	IA	-	Nil	-
BN3	19/03/2024 21:07	5.5	231	D	Yes	40	-	IA	-	Nil	-
BN3	19/03/2024 22:20	5.7	222	D	Yes	40	50	IA	IA	Nil	Nil

Notes: 1. Noise limits are adjusted by +5 dB during 'very noise-enhancing meteorological conditions' in accordance with the NPfI.

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

3. Degrees magnetic north, "-" indicates calm conditions.

5 Summary

EMM was engaged by Iluka Resources Limited to conduct a quarterly noise survey of construction at the site. 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 during the day, evening, and night periods of 19 March 2024 at three monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the Quarter 1 2024 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

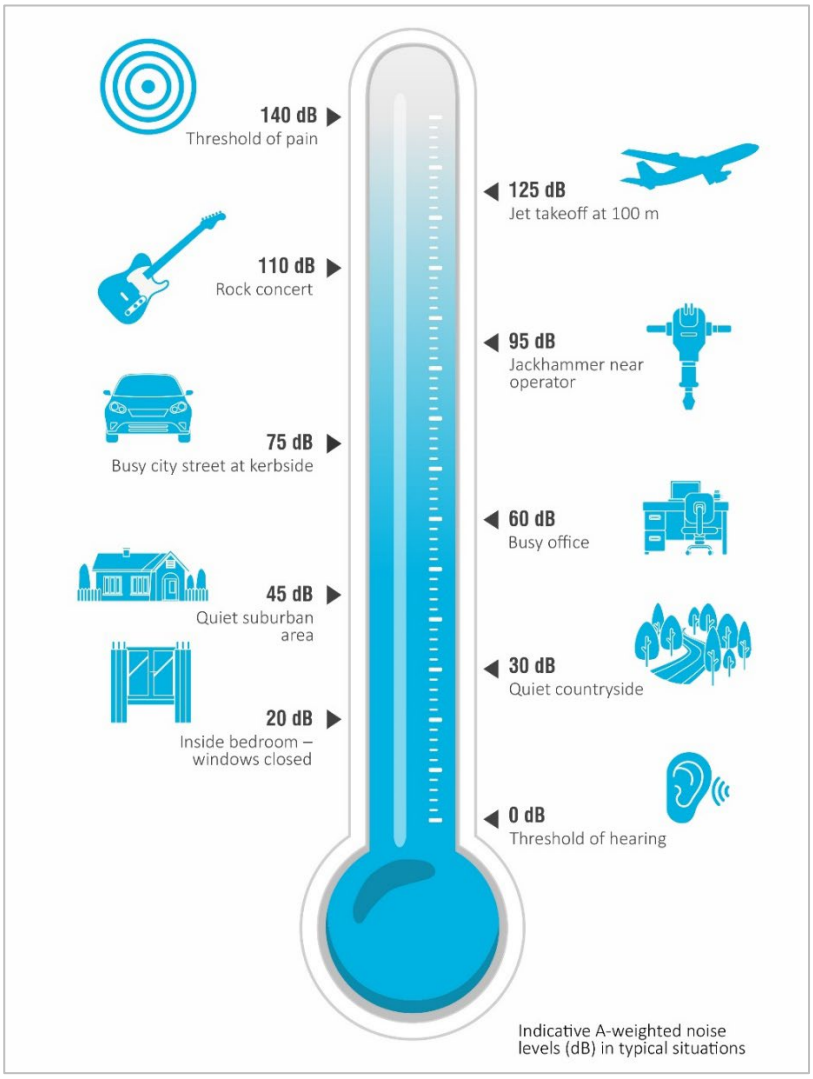

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development Consent SSD-5285 (MOD 2, August 2023)

NOISE

Operational Noise Criteria

3. Except for the noise-affected land in Table 1, the Applicant must ensure that the noise generated by the development does not exceed the noise criteria in Table 2.

Table 2: Noise criteria dB(A)

Location	Day $L_{Aeq(15min)}$	Evening $L_{Aeq(15min)}$	Night $L_{Aeq(15min)}$	Night $L_{A1(1min)}$
Any residence on privately-owned land	35	35	35	45
Mungo National Park and Mungo State Conservation Area (when in use)	50	50	50	-

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the *NSW Noise Policy for Industry* (EPA, 2017).

However, these noise criteria do not apply if the Applicant has an agreement with the owner/s or leaseholders of the residence to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

4. The Applicant must:
   (a) implement all reasonable and feasible measures to minimise the construction, operational and road noise of the development;
   (b) minimise the noise impacts of the development during adverse meteorological conditions; and
   (c) undertake regular attended monitoring of the noise of the development, to ensure compliance with the relevant conditions of this consent.

Noise Management Plan

5. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
   (a) be prepared in consultation with the EPA;
   (b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions of this consent;
   (c) include a noise monitoring program for evaluating and reporting on:
      - compliance against the noise criteria in this consent; and
      - compliance against the noise operating conditions; and
   (d) defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

5A. The Applicant must not commence construction until the Noise Management Plan is approved by the Secretary.

5B. The Applicant must implement the Noise Management Plan as approved by the Secretary.

B.2 Environmental protection licence No. 20795

P1 Location of monitoring/discharge points and areas

P1.3 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identification no.	Type of monitoring point	Location description
14	Noise monitoring	Noise monitoring point labelled "BN1" identified in Table 5 and Figure 8 of the document titled 'Noise Management Plan' dated January 2023 and kept on EPA file DOC23/531325.
15	Noise monitoring	Noise monitoring point labelled "BN2" identified in Table 5 and Figure 8 of the document titled 'Noise Management Plan' dated January 2023 and kept on EPA file DOC23/531325.
16	Noise monitoring	Noise monitoring point labelled "BN3" identified in Table 5 and Figure 8 of the document titled 'Noise Management Plan' dated January 2023 and kept on EPA file DOC23/531325.

L3 Noise limits

L3.1 Noise from the premises must not exceed the limits specified in the following table:

Location	Day [dB(A) LAeq 15 minute]	Evening [dB(A) LAeq 15 minute]	Night [dB(A) LAeq 15 minute]	Night [dB(A) LA1 1 minute]
All dwellings on privately-owned land not assigned acquisition or mitigation rights	35	35	35	45
Any National Park or Conservation Area	50	50	50	

L3.2 The noise emission limits identified in this licence apply under all meteorological conditions except:
a) during rain and wind speeds (at 10m height) greater than 3m/s; and
b) under "non-significant weather conditions".

M6 Noise monitoring

M6.1 To assess compliance with the noise limits specified within this licence, the licensee must undertake operator

attended noise monitoring at each specified noise monitoring point in accordance with the table below.

POINT 14,15,16

Assessment period	Minimum frequency in a reporting period	Minimum duration within assessment period	Minimum number of assessment period
Day, Evening, Night	Quarterly	15 minutes	1 operation day

B.3 Noise management plan

Sc.3(C.3) Except for the noise-affected land in Table 1, the Applicant must ensure that the noise generated by the development does not exceed the noise criteria in Table 2.

Table 2: Noise criteria dB(A)

Location	Day $L_{Aeq(15min)}$	Evening $L_{Aeq(15min)}$	Night $L_{Aeq(15min)}$	Night $L_{A1(1min)}$
Any residence on privately-owned land	35	35	35	45
Mungo National Park and Mungo State Conservation Area (when in use)	50	50	50	-

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (EPA, 2017).

However, these noise criteria do not apply if the Applicant has an agreement with the owner/s or leaseholders of the residence to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Section 4.7

The noise criteria in Table 2 apply under all meteorological conditions except the following:

- wind speeds greater than 3 m/s at 10 metres above ground level; or
- stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 m above ground level; or
- temperature inversion conditions greater than 8ºC/100m.

Mungo National Park is located some 65km north of the west Balranald mine site and some 26km north of the Nepean deposit. The Balranald Mineral Sands Noise Assessment (EMM, 2015) did not identify any predicated noise impacts to Mungo National Park, therefore it is not proposed that any compliance monitoring will be undertaken to assess compliance with criteria for Mungo National Park as specified in Table 2.

4.7. Noise monitoring program

The noise monitoring program will comprise attended noise monitoring representative of the privately owned receivers most likely to be affected by noise generated by Project construction, mining operations and transport. Irrespective of land ownership these locations will be used to assess compliance with noise criteria specified in Table 2.

Noise monitoring will be undertaken in accordance with the relevant requirements for reviewing performance set out in the NSW *Noise Policy for Industry* (NPI) (EPA, 2017).

Meteorological monitoring will be conducted at Iluka'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.

4.7.2. Attended noise monitoring

An overview of the noise monitoring program is provided in Table 5. Figure 8 below shows the location of noise monitoring locations and sensitive receiver locations relevant to the Project area.

Table 5- Noise monitoring program

Site ID	Location	Frequency/Assessment period	Units of measure
BN1	Adjacent Balranald-Ivanhoe Rd (R54 & R57)	Quarterly during construction and quarterly during operations (first 12 months) *Day/Evening/Night	LAeq(15min)
BN2	Burke and Wills Rd (R2)		
BN3	Cringadale/Karra boundary (R362)		

** Assessment period is defined as: day (7am to 6pm); evening (6pm to 10pm); or night (10pm to 7am)*

Attended noise monitoring at the sites will occur on a quarterly basis (i.e. at least 4 times in each calendar year) and in accordance with AS 1055:2018 *Acoustics- Description and Measurement of Environmental Noise* and the NPI (EPA, 2017).

Appendix C
Calibration certificates

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C.1 Calibration certificates

NVMS

Sydney Calibration Laboratory
Suite 4.03, Level 4, 3 Thomas Holt Drive, Macquarie Park NSW 2113, Australia
Accredited for compliance with ISO/IEC 17025 - Calibration. Laboratory No. 1301

NATA
WORLD RECOGNISED ACCREDITATION

CERTIFICATE OF CALIBRATION

Certificate No: CAU2300634 Page 1 of 11

CALIBRATION OF:

Sound Level Meter:	Brüel & Kjær	2250	No: 3029726
Microphone:	Brüel & Kjær	4189	No: 3279089
Preamplifier:	Brüel & Kjær	ZC-0032	No: 30515
Supplied Calibrator:	Brüel & Kjær	4231	No: 3026661
Software version:	BZ7222 Version 4.7.6	Pattern Approval:	-
Instruction manual:	BE1712-22	Identification:	N/A

CUSTOMER:

EMM Consulting
Suite 01, 20 Chandos Street
St Leonards NSW 1590

CALIBRATION CONDITIONS:

Preconditioning:	4 hours at 23 °C
Environment conditions:	*see actual values in **Environmental conditions** sections*

SPECIFICATIONS:

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC61672-1:2013 class 1.
Procedures from IEC 61672-3:2013 were used to perform the periodic tests.
The measurements included in this document are traceable to Australian/National standards.

PROCEDURE:

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System B&K 3630 with application software type 7763 (version 8.6 - DB: 8.60) and test procedure 2250-4189.

RESULTS:

	Initial calibration		Calibration prior to repair/adjustment
X	Calibration without repair/adjustment		Calibration after repair/adjustment

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of Calibration: 08/09/2023 Certificate issued: 11/09/2023

Craig Robert Patrick
Calibration Technician

Sajeeb Tharayil
Approved signatory

Australian Calibration Laboratory
Suite 4.03, Level 4, 3 Thomas Holt Drive, Macquarie Park NSW 2113, Australia
Accredited for compliance with ISO/IEC 17025 - Calibration. Laboratory No. 1301

CERTIFICATE OF CALIBRATION

Certificate No: CAU2300633

CALIBRATION OF:

Acoustic Calibrator 4231 (SN>=3002559) Class 1 No: 3026661

Identification: N/A

CLIENT:

EMM Consulting
Suite 01, 20 Chandos Street
St Leonards NSW 1590

CALIBRATION CONDITIONS:

Preconditioning:	12 hours at 23 °C		
Environment conditions	Air temperature:	23.5 °C	± 3°C
	Air pressure:	100.6 kPa	± 3 kPa
	Relative Humidity:	25.4 %RH	± 20 %RH

SPECIFICATIONS:

The acoustic calibrator has been calibrated in accordance with the requirements as specified in IEC 60942:2017 class 1.
The measurements included in this document are traceable to Australian/National standards.

PROCEDURE:

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System B&K 3630 with application software type 7794 (version 8.6 - DB: 8.60) and test procedure P_4231_4192_A_M01-a.

RESULTS:

	Initial calibration		Calibration prior to repair/adjustment
X	Calibration without repair/adjustment		Calibration after repair/adjustment

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of Calibration: 08/09/2023

Certificate issued: 11/09/2023

Craig Robert Patrick
Calibration Technician

Sajeeb Tharayil
Approved signatory

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