Mannering Colliery

Monthly attended noise monitoring - September 2022

Prepared for Great Southern Energy Pty Ltd (trading as Delta Coal)

October 2022

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E220750 1

October 2022

Version	Date	Prepared by	Approved by	Comments
2	21 October 2022	Teanuanua Villierme	Tony Welbourne	Final

Approved by

Tony Welbourne
Associate Director – Acoustics
21 October 2022

Level 3 175 Scott Street
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Appendices

Tables

Figures

1 Introduction

EMM Consulting Pty Limited (EMM) was engaged to complete operator-attended noise surveys on behalf of Great Southern Energy Pty Ltd (Delta Coal).

The purpose of the monitoring was to address requirements of the approved Mannering Colliery Noise Management Plan (NMP), prepared to satisfy the requirements of the project approval MP06_0311 (PA) and Environment Protection License (EPL) 191. The NMP incorporates noise management for both Delta Coal's Chain Valley Colliery (CVC) and Mannering Colliery (MC).

Noise monitoring is required to occur on a monthly basis for MC. This report presents the results and findings of attended noise monitoring conducted on 7 September 2022.

The following material was referenced as part of this assessment:

- DPIE, PA MP06_0311, as modified on 5 June 2020 (current as of the monitoring date 7 September 2022);
- Environment Protection Authority (EPA), EPL 191, as varied on 14 April 2021 (current as of the monitoring date 7 September 2022);
- NSW EPA, Noise Policy for Industry (NPfI), 2017; and
- Chain Valley Colliery and Mannering Colliery Noise Management Plan (approved 19 April 2022) updated following MC Mod 5 approval (Mod 5 approval).

A glossary of acoustic terms relevant to this report is provided in Appendix A.

2 Noise limits

2.1 Overview

Noise limits for MC are provided in Table 1, Condition 2 of Schedule 3 of the PA. The EPL references the PA with respect to noise limits. Extracts of PA and EPL sections pertaining to noise are provided in Appendix B and Appendix C, respectively.

The NMP was prepared in line with the Mod 5 approval and in accordance with the NPfI. Three attended noise monitoring locations representative of the PA noise assessment locations have been adopted in the NMP for determining compliance with relevant noise limits.

2.2 Noise limits

The MC attended noise monitoring program is undertaken on a monthly basis during the evening and night periods. Attended noise monitoring locations and relevant limits as per the NMP are summarised in Table 2.1.

Table 2.1 Attended noise monitoring locations and noise limits

Attended noise monitoring location	Assessment locations	Day $L_{Aeq,15min}$, dB	Evening $L_{Aeq,15min}$, dB	Night $L_{Aeq,15min}$, dB	Night $L_{A1,1min}$, dB
RA1	4, 5, 6	40	36	36	46
RA2	7, 8	40	40	40	45
RA3	9, 11, 18, 20	40	39	39	49

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

2.3 Adjustment to noise limits under certain meteorological conditions

The PA (Mod 5) states the following:

> 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).

Section 5.2 of the NPfI states that noise limits applicable under 'very noise-enhancing' conditions should be the limits that apply under 'standard' or 'noise-enhancing' conditions plus 5 dB. This implies that there will be no periods when noise limits do not apply due to meteorological conditions. Refer the glossary of acoustic terms in Appendix A for the definition of 'standard', 'noise-enhancing' and 'very noise -enhancing' meteorological conditions.

As per the PA (Mod 5) and NMP, and in accordance with the NPfI, this assessment has adopted a +5 dB adjustment to the limits shown in Table 2.1 when monitoring is undertaken during the following 'very noise-enhancing' conditions:

- wind speeds greater than 3 m/s at 10 m above ground level;

- stability category F temperature inversion conditions with wind speeds greater than 2 m/s at 10 m above ground level; or
- stability category G temperature inversion conditions.

It is indicated in Table 4.1, where relevant, when monitoring has been undertaken during 'very noise-enhancing' conditions and a +5 dB adjustment to the noise limits has been adopted.

2.4 Modifying factors

Assessment and reporting of modifying factors has been done in accordance with Fact Sheet C of the NPfI.

3 Assessment methodology

3.1 Attended noise monitoring

To quantify noise emissions from MC, 15-minute operator-attended noise monitoring surveys were completed at three representative locations as per the NMP.

Attended noise monitoring locations and their coordinates are listed in Table 3.1 and are shown in Figure 3.1.

Table 3.1 Attended noise monitoring locations

Attended noise monitoring location	Description	Coordinates (MGA56)	
		Easting	Northing
RA1	Pacific Highway, Doyalson	364646	6327221
RA2	Macquarie Shores Home Village, Doyalson North	365164	6328332
RA3	Tall Timbers Road (northern end), Kingfisher Shores	365069	6328953

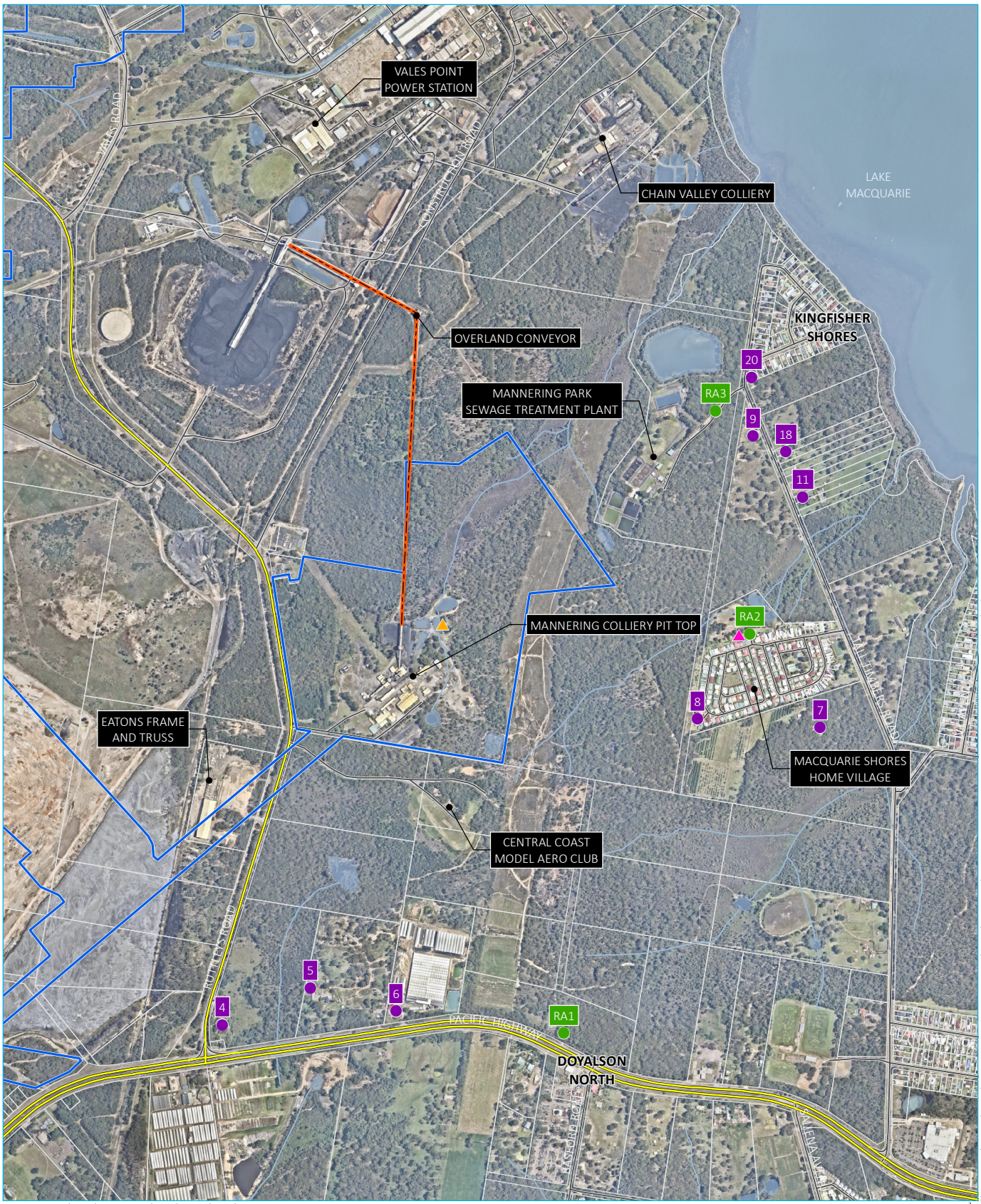
The attended noise monitoring consisted of two 15-minute operator-attended noise monitoring surveys at each of the monitoring locations (ie RA1, RA2 and RA3); one survey during the evening period and one survey during the night period in accordance with methodology outlined in the NMP.

As per the NMP, attended noise monitoring is scheduled considering the occurrence of regular operations at MC. Noise monitoring is generally planned to avoid scheduled down-time or maintenance. Regular operations (ie coal production) were occurring during the monitoring period.

3.2 Instrumentation

A Brüel & Kjær 2250 Type 1 sound analyser (s/n 2759405) was used to conduct 15-minute attended measurements and record one-third octave frequency and statistical noise indices. The sound analyser was calibrated before and on completion of each measurement using a Svantek SV36 sound level calibrator (s/n 79952). Instrumentation calibration certificates are provided in Appendix D.

Where possible throughout each measurement, the operator has quantified separately site noise and other significant sources. This was done by matching audible sounds with the sound analyser response (where applicable) and/or via post-analysis of data (eg low-pass filtering).



Source: EMM (2021); NearMap (2019); DFSI (2017)

0 250 500 m

GDA 1994 MGA Zone 56

N

KEY

- Mannering Colliery project approval boundary
- Alignment of overland conveyor to VPPS
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary
- Assessment location
- Attended monitoring location
- Continuous monitoring location
- Meteorological station

Attended noise monitoring and assessment locations

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Figure 3.1

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3.3 Determination of stability categories

For the purpose of this assessment and as required by the NMP, atmospheric stability categories were determined for each 15-minute attended monitoring period. The stability category data as well as the average wind data (speed and direction) for the monitoring period were obtained from MC's weather station located to the north of the site (refer to Figure 3.1).

The stability categories and associated ranges in temperature lapse rates are presented in Table 3.2.

Table 3.2 Stability categories and temperature lapse rates

Stability category	Temperature lapse rate (ΔT) (°C/100 m)
A	$\Delta T < -1.9$
B	$-1.9 \leq \Delta T < -1.7$
C	$-1.7 \leq \Delta T < -1.5$
D	$-1.5 \leq \Delta T < -0.5$
E	$-0.5 \leq \Delta T < 1.5$
F	$1.5 \leq \Delta T < 4.0$
G	$\Delta T \geq 4.0$

Source: NPfI (EPA 2017).

4 Review of data and discussion

Results of attended noise measurements are summarised in Table 4.1. Noise contribution from MC was determined for each measurement using in-field observations and post-analysis of data as required (eg removing higher frequencies that are not mine related where applicable). Attended noise monitoring was completed during the evening and night periods on 7 September 2022.

Meteorological data for the monitoring period was sourced from MC's weather station to determine relevant noise limits in accordance with the NMP. Meteorological conditions were 'standard' or 'noise-enhancing' for four of the six measurements and, in accordance with the NMP, the standard noise limits shown in Table 2.1 applied for those. Meteorological conditions were 'very noise-enhancing' (ie outside the NPfI 'standard' or 'noise-enhancing' conditions) for two of the six measurements and, in accordance with the NMP, the noise limits shown in Table 2.1 were adjusted by +5 dB for those (this is indicated in Table 4.1).

Site noise was inaudible during all six measurements. Typically, when a particular source is not audible above local ambient noise, the likely contribution of that source is at least 10 dB below the measured background (L_{A90}) level. For all the measurements, the measured $L_{A90,15min}$ was no greater than 10 dB above the applicable $L_{Aeq,15min}$ limit. Therefore, the site $L_{Aeq,15min}$ during these measurements when site noise was inaudible are considered to have been below applicable limits.

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

Noise from MC ($L_{Aeq,15min}$ and L_{Amax}) were determined to have been below relevant limits at all locations during this survey.

Table 4.1 MC attended noise monitoring results – September 2022

Location	Date	Start time (hours)	Total 15-minute noise levels, dB								Site contributions, dB			Met. conditions[4] Very noise-enhancing?	Applicable noise limits, dB		Exceedance, dB	Comments
			L_{Amin}	L_{A90}	L_{Aeq}	LP L_{Aeq}[1]	L_{A10}	L_{A1}	L_{Amax}	L_{Ceq}	Mod. factor[2]	L_{Aeq}	L_{Amax}[3]		L_{Aeq}	L_{Amax}[3]		
RA1	7/9	20:01 (Eve.)	41	47	60	56	64	67	75	66	N/A	IA	N/A	2.3 m/s 40° SC F Yes	41[5] (36+5)	N/A	Nil	**MC inaudible**. Traffic on the Pacific Highway consistently audible. Insects consistently audible. VPPS hum audible during traffic lulls. Aircraft noise audible once.
RA3	7/9	20:21 (Eve.)	37	39	44	41	45	54	63	62	N/A	IA	N/A	2.1 m/s 37° SC F Yes	44[5] (39+5)	N/A	Nil	**MC inaudible**. VPPS hum consistently audible. Insects consistently audible. Wind in foliage frequently audible. Traffic on Tall Timbers Road frequently audible.
RA2	7/9	21:15 (Eve.)	36	38	39	36	40	42	50	58	N/A	IA	N/A	1.7 m/s 36° SC F No	40	N/A	Nil	**MC inaudible**. VPPS hum consistently audible. Insects consistently audible. Traffic on Tall Timbers Road frequently audible.
RA1	7/9	22:27 (Night)	36	39	58	55	61	67	84	67	N/A	IA	IA	1.8 m/s 30° SC F No	36	46	Nil	**MC inaudible**. Traffic on the Pacific Highway consistently audible. Insects consistently audible. VPPS hum audible during traffic lulls.
RA3	7/9	23:08 (Night)	35	37	39	37	40	44	57	61	N/A	IA	IA	1.9 m/s 58° SC F No	39	49	Nil	**MC inaudible**. VPPS hum consistently audible. Insects consistently audible. Birds and wind in foliage occasionally audible. Traffic on Tall Timbers Road occasionally audible.

Table 4.1 MC attended noise monitoring results – September 2022

Location	Date	Start time (hours)	Total 15-minute noise levels, dB								Site contributions, dB			Met. conditions[4] Very noise-enhancing?	Applicable noise limits, dB		Exceedance, dB	Comments
			L_{Amin}	L_{A90}	L_{Aeq}	LP L_{Aeq}[1]	L_{A10}	L_{A1}	L_{Amax}	L_{Ceq}	Mod. factor[2]	L_{Aeq}	L_{Amax}[3]		L_{Aeq}	L_{Amax}[3]		
RA2	7/9	23:30 (Night)	35	37	38	36	40	43	54	59	N/A	IA	IA	2.0 m/s 46° SC F No	40	45	Nil	**MC inaudible**. VPPS hum consistently audible. Insects consistently audible. Wind in foliage occasionally audible. Distant traffic audible once.

Notes:
1. Low-pass $L_{Aeq,15min}$ noise level which excludes higher frequencies above the 800 Hz one-third octave band centre frequency.
2. Modifying factor in accordance with Fact sheet C of the NPfI (refer to Section **Error! Reference source not found.**).
3. For assessment purposes the recorded L_{Amax} has been used as a conservative estimate of the $L_{A1,1min}$.
4. Meteorological data including wind speed, wind direction and stability category (SC) were taken as an average over 15 minutes from MC weather station (refer to Section 3.3).
5. Includes a +5 dB adjustment to noise limits due to 'very noise-enhancing' meteorological conditions as per the NMP (refer to Section 2.3).
6. IA = inaudible.
76. N/A = not applicable.

5 Conclusion

EMM has completed a survey of mine noise from MC within the surrounding community based on attended measurements conducted on 7 September 2022.

Meteorological data for the monitoring period was sourced from MC's weather station to determine relevant noise limits in accordance with the NMP. Meteorological conditions were 'standard' or 'noise-enhancing' for four of the six measurements, and, in accordance with the NMP, the standard noise limits applied for those. Meteorological conditions were 'very noise-enhancing' for two of the six measurements, and, in accordance with the NMP, the standard noise limits were adjusted by +5 dB for those.

The assessment of noise from site included consideration of modifying factors for certain noise characteristics, such as low frequency noise, in accordance with the NPfI. Modifying factors were found to be not relevant at all monitoring locations.

Noise levels from MC were below relevant noise limits at all monitoring locations.

References

Chain Valley Colliery and Mannering Colliery Noise Management Plan, 2022.

NSW Department of Planning and Environment, Project Approval MP 06_0311, 2020.

NSW Environment Protection Authority, Environment Protection License 191, 2021.

NSW Environment Protection Authority, Noise Policy for Industry, 2017.

Appendix A
Glossary of acoustic terms

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Several technical terms are discussed in this report. These are explained in Table A.1.

Table A.1 Glossary of acoustic terms

Term	Description
dB	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
L_{A1}	The 'A-weighted' noise level which is exceeded 1% of the time.
$L_{A1,1min}$	The 'A-weighted' noise level exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The 'A-weighted' noise level which is exceeded 10% of the time.
L_{A90}	Commonly referred to as the background noise level. The 'A-weighted' noise level exceeded 90% of the time.
L_{Aeq}	The energy average noise from a source. This is the equivalent continuous 'A-weighted' sound pressure level over a given period. The $L_{Aeq,15min}$ descriptor refers to an L_{Aeq} noise level measured over a 15-minute period.
L_{Amin}	The minimum 'A-weighted' noise level received during a measuring interval.
L_{Amax}	The maximum root mean squared 'A-weighted' sound pressure level (or maximum noise level) received during a measuring interval.
L_{Ceq}	The equivalent continuous 'C-weighted' sound pressure level over a given period. The $L_{Ceq,15min}$ descriptor refers to an L_{Ceq} noise level measured over a 15-minute period. C-weighting can be used to measure low frequency noise.
Day period	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening period	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
NPfI	Noise Policy for Industry (EPA 2017).
Standard meteorological conditions	Stability categories A-D with wind speed up to 0.5 m/s at 10 m above ground level during the day, evening, or night period, as defined in Table D1 of the NPfI.
Noise-enhancing meteorological conditions	Stability categories A-D with wind speed up to 3 m/s at 10 m above ground level during the day, evening, or night period, or stability category F with wind speed up to 2 m/s at 10 m above ground level during the night period, as defined in Table D1 of the NPfI. This does not necessarily imply that meteorological conditions were enhancing site noise at the monitoring location.
Very noise-enhancing meteorological conditions	Meteorological conditions outside of the range of either standard or noise-enhancing meteorological conditions, as defined in the NPfI. This does not necessarily imply that meteorological conditions were enhancing site noise at the monitoring location.
Night period	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.
Temperature inversion	A meteorological condition where the atmospheric temperature increases with altitude.

It is useful to have an appreciation of the decibel (dB), the unit of noise measurement. Table A.2 gives an indication as to what an average person perceives about changes in noise levels in the environment.

Table A.2 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise in surrounding environment
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

Examples of common noise levels are provided in Figure A.1.

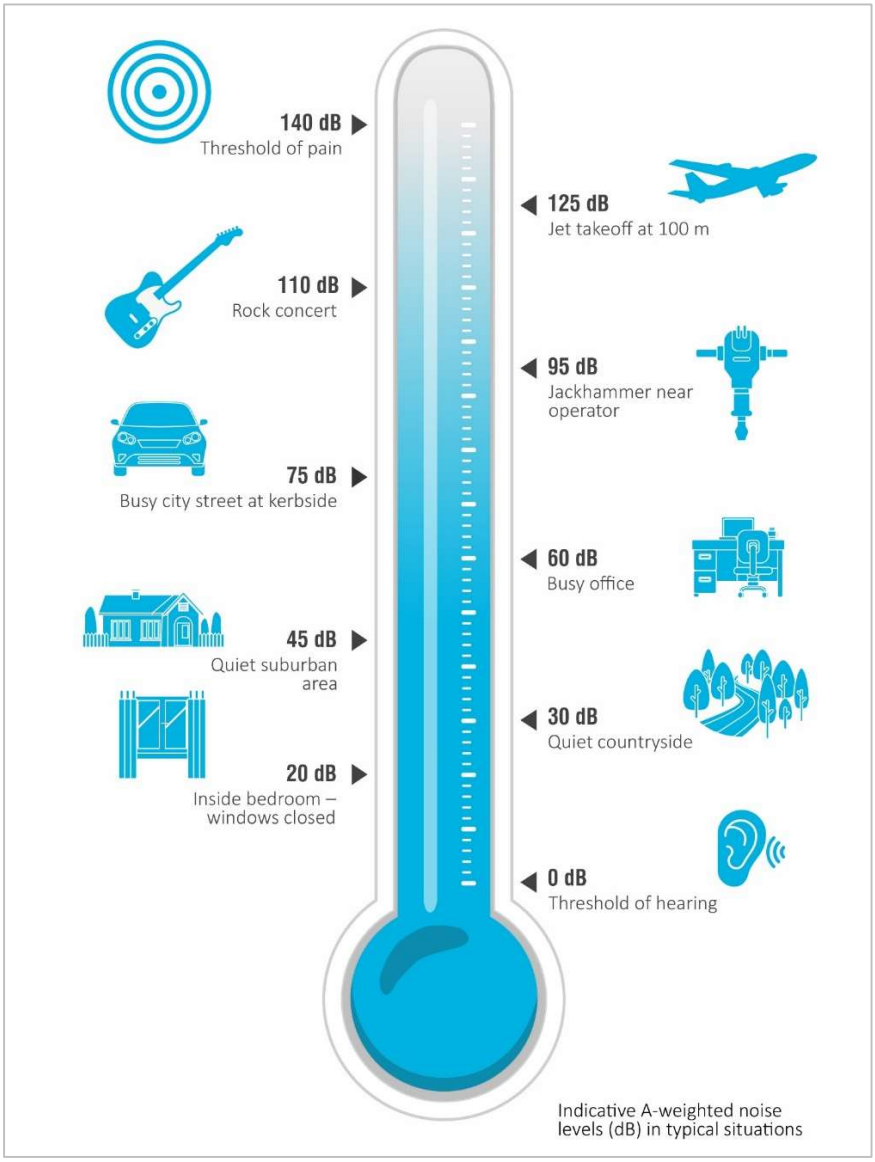

Figure A.1 Common noise levels

Appendix B
Project approval extract

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SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Construction Noise

1. The Applicant must ensure that the noise generated by any construction work is managed in accordance with the requirements outlined in the *Interim Construction Noise Guideline* (DECC, 2009).

Operational Noise Criteria

2. Except for the carrying out of construction works, the Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence[a] on privately-owned land.

***Table 1**: Operational noise criteria dB(A)*

Noise Assessment Location	***Day*** $L_{Aeq\ (15\ min)}$	***Evening*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{A1\ (1\ min)}$
4 – di Rocco	40	36	36	46
5 - Keighran	40	39	39	49
6 – Swan	40	37	37	47
7 – Druitt	40	35	35	45
8 – Macquarie Shores Home Village	42	42	42	47
9 - Jeans	40	37	37	47
11 - Jeans	40	36	36	46
18 - Jeans	40	36	36	46
20 – Knight and all other privately-owned residences	40	36	36	46

[a] *The Noise Assessment Locations referred to in Table 1 are shown in Appendix 4.*

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).

3. The noise criteria in Table 1 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

3A. The Applicant must:

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

(b) implement reasonable and feasible noise attenuation measures on all plant and equipment that will operate in noise sensitive areas;

(c) operate a comprehensive noise management system commensurate with the risk of impact;

(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 NPfI);

(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;

(f) regularly assess the noise monitoring data and modify or stop operations on the site to ensure compliance with the relevant conditions of this consent; and
(g) implement reasonable and feasible measures to further enclose the structure housing the coal crusher in order to further mitigate noise from operational activites.

3B. The Applicant must decommission the surface rotary breaker identified in the Statement of Commitments at Appendix 3, within 3 months of approval of Modification 5.

Noise Management Plan

3C. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:
(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;
(b) 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 when the noise criteria in this consent do not apply (see NPfI);
(c) describe the noise management system in detail; and
(d) include a monitoring program that:
i. uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the development;
ii. monitors noise at the nearest and/or most affected residences;
iii. includes a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results over time;
iv. adequately supports the noise management system;
v. includes a protocol for distinguishing noise emissions of the development from any neighbouring developments; and
vi. 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.

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

SUBSIDENCE

4. The Applicant must limit its coal extraction methods on the site to first workings only, and must not undertake second workings.

5. Deleted.

SOIL AND WATER

Discharge

6. The Applicant must only discharge water from the site as expressly provided for by its EPL.

7. The Applicant must investigate, assess and report on the ecological interactions of minewater discharged from the site with the aquatic ecology of the unnamed creek and wetlands (and associated vegetation) between the minewater discharge point/s and Lake Macquarie. This report must:
(a) be prepared in consultation with EPA by suitably qualified expert/s whose appointment/s have been approved by the Planning Secretary;
(b) be submitted to the Planning Secretary by the end of March 2009; and
(c) assess the probable alterations in the local ecology attributable to previous and proposed minewater discharges and any future cessation of minewater discharge flows.

Water Management Plan

8. The Applicant must prepare a Water Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:
(a) be prepared in consultation with DPIE Water by suitably qualified expert/s whose appointment/s have been approved by the Planning Secretary;
(b) be submitted the Planning Secretary by the end of March 2009; and
(c) include a:
- Site Water Balance;

Appendix C
EPL extract

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Environment Protection Licence

L4.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.
This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Waste	Any other waste received on the premises for storage, treatment, processing, sorting or disposal and which receipt is not a scheduled activity under Schedule 1 of the POEO Act, as in force from time to time.		
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2014	As specified in each particular resource recovery exemption	N/A

L4.2 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L4.3 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an environment protection licence.

L5 Noise limits

Note: Noise limits are not specified as a condition of this licence. Noise limits are prescribed with the conditions of Project Approval 06_0311 granted under the *Environmental Planning and Assessment Act 1979.* Under the *Environmental Planning and Assessment Act 1979* the Department of Planning is the appropriate authority in respect of the administration and regulation of the Project Approval.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

Appendix D
Calibration certificates

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Certificate Of Calibration

Certificate No: SLM31670

Equipment Tested: Sound Level Meter

Manufacturer:	B & K		
Type No:	2250	**Serial No:**	2759405
Mic. Type:	4189	**Serial No:**	2983733
Pre-Amp. Type:	ZC0032	**Serial No:**	22666
Filter Type:	1/3 Octave	**Test No:**	F031671

Owner: EMM Consulting
Level 3, 175 Scott Street
Newcastle, NSW 2300

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	992	hPa ±1 hPa	**Date of Receipt :**	02/02/2022
Temperature	26	°C ±1° C	**Date of Calibration :**	02/02/2022
Relative Humidity	48	% ±5%	**Date of Issue :**	03/02/2022

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

Checked By: ..... **Authorised Signature:** .....

Jack Kielt

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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Acoustic and Vibration Measurements

Acu-Vib Electronics
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Head Office & Calibration Laboratory
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C30591

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer: Svantek
Type No: SV-36 **Serial No:** 79952
Owner: EMM Consulting Pty Ltd
L3, 175 Scott Street
Newcastle, NSW 2300
Tests Performed: Measured Output Pressure level, Frequency & Distortion
Comments: See Details overleaf. All Test Passed.

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 µPa)	Frequency (Hz)	THD&N (%)
Level1:	NA	N	94.12 dB	999.99 Hz	1.58 %
Level2:	NA	N	114.05 dB	999.99 Hz	1.12 %
Uncertainty			±0.11 dB	±0.05%	±0.20 %
Uncertainty (at 95% c.l.) k=2					

CONDITION OF TEST:

Ambient Pressure 1007 hPa ±1 hPa
Temperature 21 °C ±1° C
Relative Humidity 43 % ±5%

Date of Receipt : 16/09/2021
Date of Calibration : 16/09/2021
Date of Issue : 16/09/2021

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

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AUTHORISED SIGNATURE: .....
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