

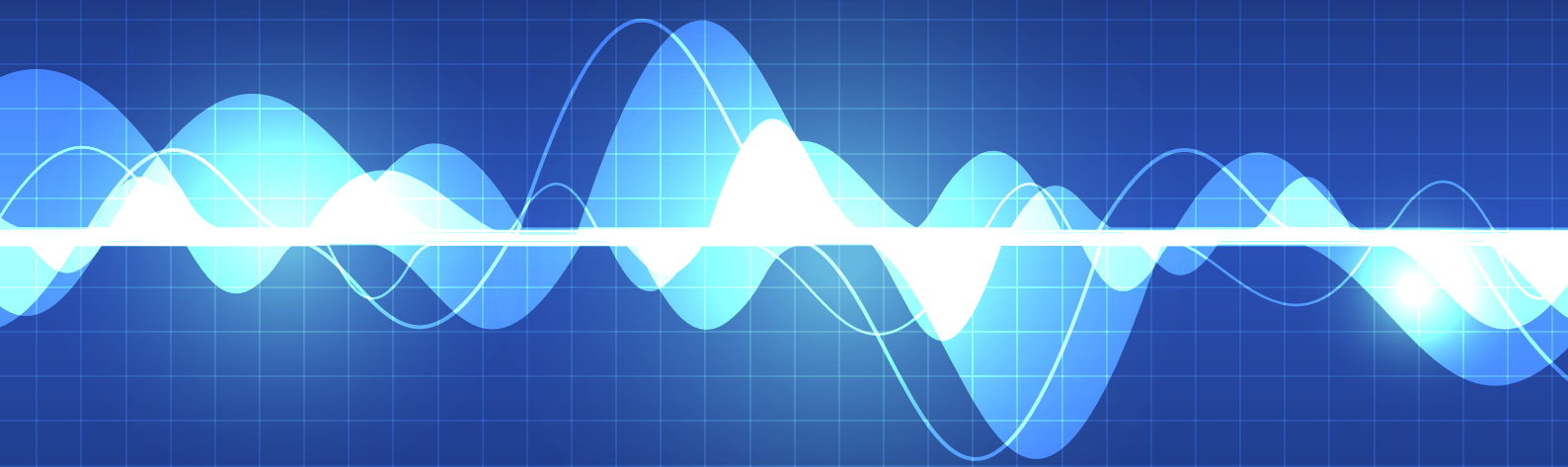
Chain Valley Colliery

Quarterly attended noise monitoring

Quarter 3 - 2019

Prepared for Great Southern Energy Pty Ltd (trading as DeltaCoal)

\ ber 2019





Servicing projects throughout Australia and internationally

SYDNEY

Ground floor, 20 Chandos Street
St Leonards NSW 2065
T 02 9493 9500
F 02 9493 9599

NEWCASTLE

Level 1, 146 Hunter Street
Newcastle NSW 2300
T 02 4907 4800
F 02 4907 4899

BRISBANE

Level 4, Suite 01, 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3839 1800
F 07 3839 1866

ADELAIDE

Level 1, 70 Pirie Street
Adelaide SA 5000
T 08 8232 2253

PERTH

PO Box 8155
Fremantle WA 6160

CANBERRA

PO Box 9148
Deakin ACT 2600

Mannering Colliery

Quarterly attended noise monitoring - Quarter 3 2019

Prepared for Great Southern Energy Pty Ltd (trading as DeltaCoal)
October 2019

EMM Newcastle
Level 3, 175 Scott Street
Newcastle NSW 2300

T 02 4907 4800

E info@emmconsulting.com.au

www.emmconsulting.com.au

Mannering Colliery

Quarterly attended noise monitoring - Quarter 3 2019

Report Number

H180389 RP3

Client

Great Southern Energy Pty Ltd (trading as DeltaCoal)

Date

18 October 2019

Version

v1 Final

Prepared by**Approved by**

**Lucas Adamson**

Acoustic Consultant

18 October 2019

Katie Teyhan

Associate

18 October 2019

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

© Reproduction of this report for educational or other non-commercial purposes is authorised without prior written permission from EMM provided the source is fully acknowledged. Reproduction of this report for resale or other commercial purposes is prohibited without EMM's prior written permission.

Table of Contents

1	Introduction	1
2	Noise limits	2
2.1	Operational and sleep disturbance noise limits	2
2.2	Low frequency noise criteria	2
3	Assessment methodology	4
3.1	Attended noise monitoring	4
3.2	Instrumentation	4
3.3	Determination of stability category	6
4	Review of data and discussion	7
5	Conclusion	10
	References	11

Appendices

Appendix A	Glossary of acoustic terms	A.1
Appendix B	Project approval extract	B.1
Appendix C	EPL extract	C.1
Appendix D	Calibration certificates	D.1

Tables

Table 2.1	Noise impact assessment criteria	2
Table 2.2	One-third octave low frequency noise thresholds	3
Table 3.1	Attended noise monitoring locations	4
Table 3.2	Stability categories and temperature lapse rates	6
Table 4.1	Mannering Colliery attended noise monitoring results – Q3 2019	8
Table A.1	Glossary of acoustic terms	A.2
Table A.2	Perceived change in noise	A.3

Figures

Figure 3.1	Site boundary and noise monitoring locations	5
Figure A.1	Common noise levels	A.3

1 Introduction

EMM Consulting Pty Limited (EMM) was engaged to complete operator attended noise surveys on behalf of DeltaCoal Pty Limited (DeltaCoal).

The purpose of the monitoring was to address requirements of the approved Mannering Colliery Noise Monitoring Program (NMP), prepared to satisfy the requirements of the project approval MP06_0311 (PA) and Environment Protection License (EPL) 191.

Noise monitoring is required to occur on a quarterly basis. This report presents the results and findings of attended noise monitoring conducted during the third quarter (Q3) of 2019 on 11 September 2019.

The following material was referenced as part of this assessment:

- Department of Planning and Environment (DPE), Project Approval MP06_0311, as modified on 18 August 2016 (current as of the monitoring date 11 September 2019);
- Environment Protection Authority (EPA), Environment Protection License (EPL) 191, as varied on 1 April 2019 (current as of the monitoring date 11 September 2019);
- Mannering Colliery Noise Monitoring Program (NMP), approved by DPE in April 2016;
- NSW EPA, Industrial Noise Policy (INP), 2000;
- NSW EPA, Industrial Noise Policy Application notes, 2017; and
- NSW EPA, Noise Policy for Industry (NPfi), 2017.

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

2 Noise limits

2.1 Operational and sleep disturbance noise limits

Manning Colliery noise limits are provided in Table 1, Condition 1 of Appendix 4B of the PA. EPL 191 references the PA with respect to noise limits. Extracts of the relevant sections of the PA and EPL pertaining to noise are provided in Appendix B and Appendix C of this report, respectively. The approved NMP adopts three attended noise monitoring locations that are representative of residences outlined in the PA. The noise monitoring locations and relevant criteria are summarised in Table 2.1.

Table 2.1 Noise impact assessment criteria

Monitoring location	Assessment location	Day	Evening	Night	Night
		$L_{Aeq,15\text{ minute}}$, dB	$L_{Aeq,15\text{ minute}}$, dB	$L_{Aeq,15\text{ minute}}$, dB	$L_{A1,1\text{ minute}}$, dB
RA1	4, 5, 6	42	42	41	49
RA2	7, 8	39	39	39	47
RA3	9, 11, 18, 20	39	39	39	49

The PA specifies the following meteorological conditions under which noise limits do not apply:

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

For this assessment, the recorded L_{Amax} has been used as a conservative estimate of the $L_{A1,1\text{ minute}}$. The INP application notes state that the EPA accepts sleep disturbance analysis based on either the $L_{A1,1\text{ minute}}$ or L_{Amax} metrics (EPA 2013), with the L_{Amax} resulting in a more conservative assessment of site noise emissions.

The PA states that modification factor corrections in the INP application notes (2017) shall be applied to the measured mine noise levels where applicable. The INP application notes state that Fact Sheet C of the NPfl (EPA 2017) now applies for the application of modifying factors.

2.2 Low frequency noise criteria

Appendix 4A Condition 5 of the PA states that noise generated by Manning Colliery is to be measured in accordance with the relevant requirements of the INP. The INP application notes state that Section 4 of the INP has been withdrawn and the modifying factor adjustments outlined in Fact Sheet C of the NPfl are to be used when assessing certain characteristics of a noise source, including low frequency noise.

Fact sheet C of the NPfl (EPA 2017) provides guidelines for applying modifying factor corrections to account for low frequency noise emissions. The NPfl specifies that a difference of 15 dB or more between site 'C-weighted' and site 'A-weighted' noise emission levels identifies the potential for an unbalanced noise spectrum and potential increased annoyance at a residential receiver.

Where a difference of 15 dB or more between site 'C-weighted' and site 'A-weighted' noise emission levels is identified, the one-third octave noise levels recorded should be compared to the threshold values in Table C2 of the NPfl (EPA 2017), which has been reproduced in Table 2.2.

Table 2.2 One-third octave low frequency noise threshold levels

One-third octave $L_{Zeq,15\text{ minute}}$ threshold levels													
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

The following modifying factor corrections for low frequency noise are to be applied to the site $L_{Aeq,15\text{ minute}}$ noise contribution where the site 'C-weighted' and site 'A-weighted' noise emission level is found to be 15 dB or more and:

- where any of the one-third octave noise levels in Table 2.2 are exceeded by up to and including 5 dB and cannot be mitigated, a 2 dB positive adjustment to measured/predicted A-weighted levels applies for the evening/night period; or
- where any of the one-third octave noise levels in Table 2.2 are exceeded by more than 5 dB and cannot be mitigated, a 2 dB positive adjustment to measured/predicted A-weighted levels applies for the day period and a 5 dB positive adjustment to measured/predicted A-weighted levels applies for the evening/night period.

Hence, where possible throughout each survey, the operator has estimated the difference between site 'C-weighted' and site 'A-weighted' noise emission levels by matching audible sounds with the response of the sound analyser ($L_{Ceq}-L_{Aeq}$). Where this was found to be 15 dB or greater, the measured one-third octave frequencies have been compared to the threshold values in Table 2.2 to identify the relevant modifying factor correction (if applicable). This method for the application of modifying factors for low frequency noise has been applied to this assessment as presented in Section 4.

It is of note that the NPfl states that low frequency noise corrections only apply under the standard or noise-enhancing (i.e. applicable) meteorological conditions.

3 Assessment methodology

3.1 Attended noise monitoring

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

Attended noise monitoring locations required as per the NMP and their coordinates are listed in Table 3.1 and are shown in Figure 3.1.

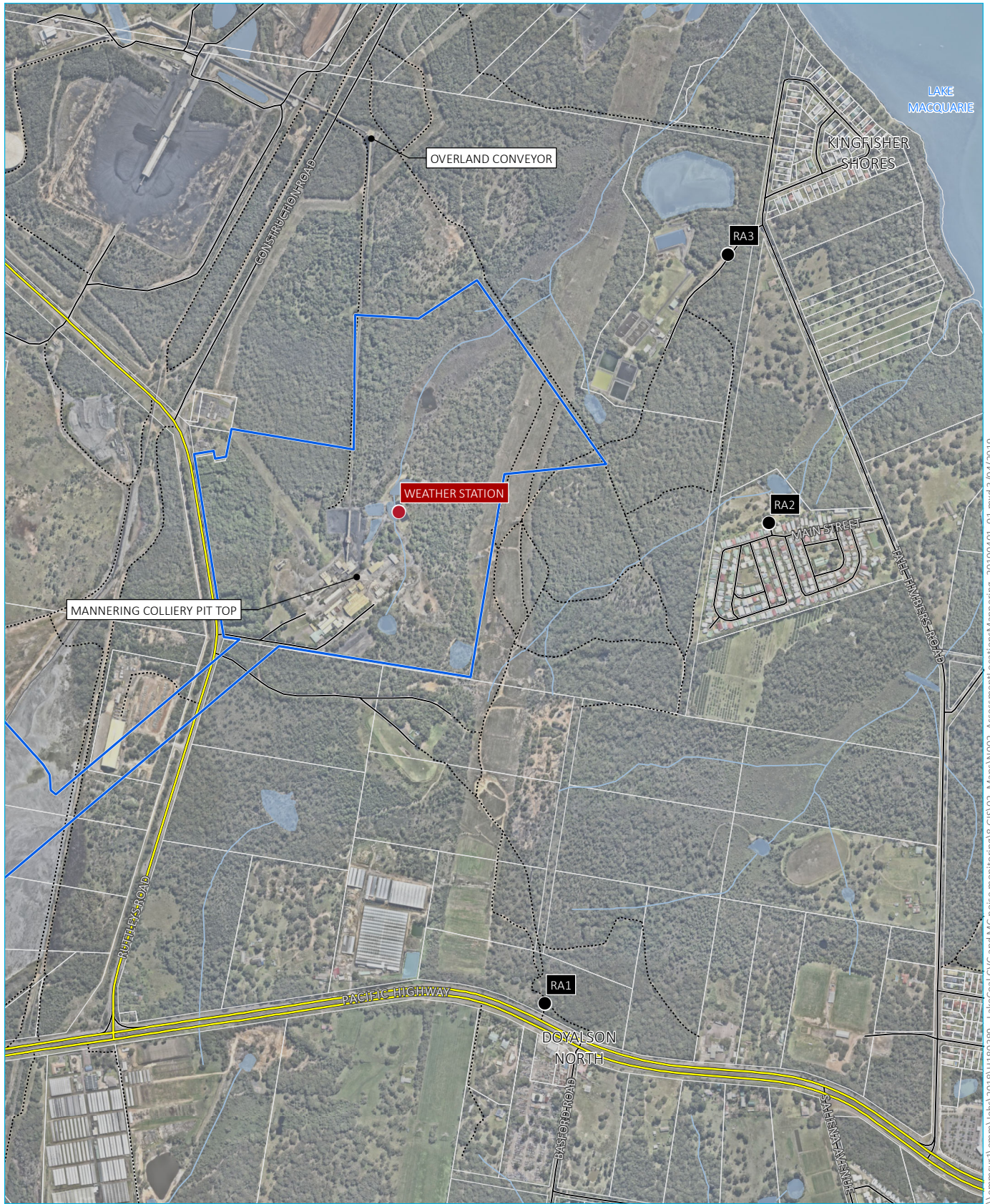
Table 3.1 Attended noise monitoring locations

Monitoring location	Description	Coordinates (MGA56)	
		Easting	Northing
RA1	Pacific Highway, Doyalson	364646	6327221
RA2	Short Street, Macquarie Shores Village	365164	6328332
RA3	Tall Timbers Road (northern end), Kingfisher Shores	365069	6328953

3.2 Instrumentation

Brüel & Kjær (B&K) 2250 and 2270 Type 1 sound analysers (s/n 2759405 and 3027603, respectively) were used to conduct 15-minute attended measurements and record one-third octave centre frequency and statistical noise indices. The sound analysers were calibrated before and on completion of the survey using a B&K Type 4230 calibrator (s/n 1276091). Instrumentation calibration certificates are provided in Appendix D.

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



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



KEY

- Mannerling Colliery project approval boundary
- Main road
- Noise monitoring location
- Weather station
- Local road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Cadastral boundary

Site boundary and noise monitoring locations

Mannerling Colliery noise monitoring
Figure 3.1



\\vemmsvr1\venm\lbs\2018\H180389 - LakeCoal CVC and MC noise monitoring\GIS\02_Maps\W002_AssessmentLocations\Mannerling_20190401_01.mxd 3/04/2019

3.3 Determination of stability category

For the purpose of this assessment and as required by the PA, EPL and NMP, stability categories were determined for each 15-min attended monitoring periods. This was completed using the sigma-theta (ST) method as per Appendix E of the INP (EPA 2000). The ST data for the monitoring period was obtained from Mannering Colliery's meteorological station located to the north of the site (refer to Figure 3.1).

Table E1 of the INP (EPA 2000) is reproduced in Table 3.2 and presents the stability categories and associated ranges in temperature lapse rates.

Table 3.2 Stability categories and temperature lapse rates

Stability category	Temperature lapse rate (ΔT) ($^{\circ}\text{C}/100\text{ m}$)
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: INP (EPA 2000).

4 Review of data and discussion

Results of attended noise measurements are summarised in Table 4.1. Mannering Colliery noise contribution was determined for each survey using in-field observations and post-analysis of data as required (e.g. removing higher frequencies that are not mine related i.e. above 630 Hz where applicable). Attended noise monitoring was completed on 11 September 2019.

The meteorological data for the monitoring period was sourced from Mannering Colliery's meteorological station to determine applicability of noise limits in accordance with the PA. In accordance with the PA, noise limits were not applicable during two of the nine measurements due to the presence of wind speeds greater than 3m/s at the time of the measurements.

Low frequency noise was conservatively assessed by comparison of the total measured one-third octave L_{Aeq} noise levels to the NPfI one-third octave low frequency noise thresholds. Site noise was inaudible at all locations during the day, evening and night measurements. Therefore, in accordance with the NPfI, modifying factors for LFN were found to be not relevant for these measurements and hence were not applied to estimated site noise levels at any of the locations.

Typically, when a particular source is not audible above local ambient noise levels, the likely L_{Aeq} contribution of that source is generally at least 10 dB below the measured background (L_{A90}) level. Therefore, site L_{Aeq} noise contributions were below the relevant limits at all locations.

Table 4.1 Mannering Colliery attended noise monitoring results – Q3 2019

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (Y/N)	Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
RA1	11/9	15:18 (Day)	43	54	65	69	72	82	73	Nil	IA	N/A	42	N/A	3.1 m/s @ 75° B class stability N	N/A	Site noise inaudible. Road traffic noise consistent. Bird noise occasional.
RA1	11/9	18:22 (Eve.)	48	54	65	69	72	75	72	Nil	IA	N/A	42	N/A	0.2 m/s @ 59° B class stability Y	Nil	Site noise inaudible. Road traffic noise consistent. Insects occasional.
RA1	11/9	22:22 (Night)	36	39	59	64	69	73	66	Nil	IA	IA	41	49	0.7 m/s @ 10° F class stability Y	Nil	Site noise inaudible. VPPS noise and insects consistent. Road traffic noise frequent.
RA2	11/9	15:05 (Day)	32	34	42	43	51	67	57	Nil	IA	N/A	39	N/A	3.4 m/s @ 75° A class stability N	N/A	Site noise inaudible. VPPS noise and bird noise consistent. Wind in trees frequent. Resident noise, local and distant traffic occasional.
RA2	11/9	18:54 (Eve.)	37	38	40	42	44	47	61	Nil	IA	N/A	39	N/A	0.3 m/s @ 65° B class stability Y	Nil	Site noise inaudible. VPPS noise, insects, frogs and bird noise consistent. Bird noise occasional.
RA2	11/9	23:14 (Night)	35	38	42	44	48	52	64	Nil	IA	IA	39	47	1.3 m/s @ 3° E class stability Y	Nil	Site noise inaudible. VPPS noise and insects, consistent. Wind in trees frequent. Resident noise, distant dogs barking, aircraft noise, local and distant traffic occasional.
RA3	11/9	15:26 (Day)	35	37	48	46	57	74	60	Nil	IA	N/A	39	N/A	2.7 m/s @ 89° A class stability Y	Nil	Site noise inaudible. VPPS noise and bird noise consistent. Wind in trees frequent. Local traffic noise, distant dogs barking and bird noise occasional.
RA3	11/9	18:42 (Eve.)	38	39	46	47	58	67	65	Nil	IA	N/A	39	N/A	0.2 m/s @ 125° B class stability Y	Nil	Site noise inaudible. VPPS noise, WWTP noise and insects consistent. Local traffic noise and bird noise occasional.

Table 4.1 Mannering Colliery attended noise monitoring results – Q3 2019

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (Y/N)	Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
RA3	11/9	22:43 (Night)	41	43	47	47	57	63	66	Nil	IA	IA	39	49	0.5 m/s @ 16° E class stability Y	Nil	Site noise inaudible. VPPS noise, WWTP noise and insects consistent. Local traffic noise, wind in trees and bird noise occasional.

- Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfl (refer to Section 2.2).
 2. For assessment purposes the L_{Amax} and the L_{A1,1 minute} are interchangeable.
 3. Meteorological data were taken as an average over 15 minutes from Mannering Colliery's weather station (Refer to Section 5.1).
 4. IA = inaudible.
 5. N/A = not applicable.

5 Conclusion

EMM has completed a review of mine noise from Mannering Colliery within the surrounding community based on attended measurements conducted on 11 September 2019.

The applicability of noise limits was assessed in accordance with the site's PA with reference to Mannering Colliery's meteorological station located to the north of the site. In accordance with the PA, noise limits were not applicable during two of the nine measurements due to the presence of wind speeds greater than 3m/s at the time of the measurements.

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

Mannering Colliery noise contributions were inaudible and determined to be below (satisfied) the noise limits, where applicable, at all monitoring locations for this round of noise monitoring.

References

Manning Colliery Noise Monitoring Program, 2016.

NSW Department of Planning and Environment, Project Approval MP 06_0311, 2016.

NSW Environment Protection Authority, Environment Protection License 191.

NSW Environment Protection Authority, Industrial Noise Policy, 2000.

NSW Environment Protection Authority, Industrial Noise Policy application notes, 2017.

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

Appendix A

Glossary of acoustic terms

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

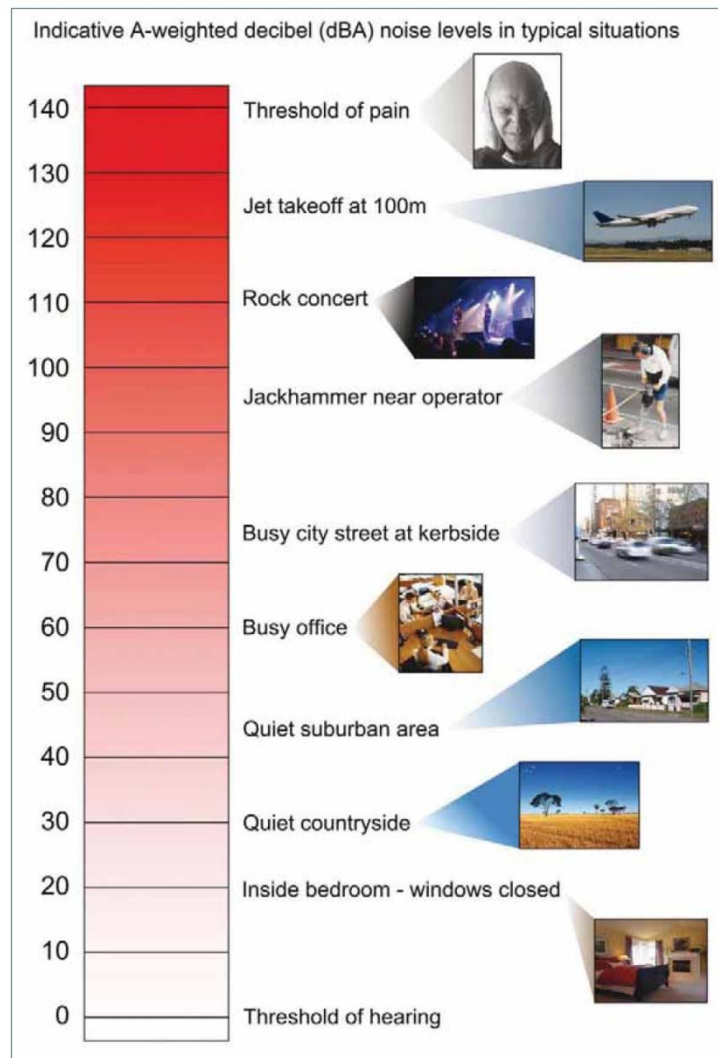
Table A.1 **Glossary of acoustic terms**

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.
$L_{A1,1 \text{ minute}}$	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. It is approximately equivalent to the average of maximum noise level.
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 $L_{Aeq,15 \text{ minute}}$ 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 $L_{Ceq,15 \text{ minute}}$ 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.
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 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. Examples of common noise levels are provided in Figure A.1.

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



Source: Road Noise Policy (Department of Environment, Climate Change and Water 2011)

Figure A.1 Common noise levels

Appendix B

Project approval extract

SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Criteria

- The Proponent **must** ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately owned land.

Table 1: Noise limits dB(A)

Day <i>L_{Aeq}(15 min)</i>	Evening <i>L_{Aeq}(15 min)</i>	Night		Location (as listed in Appendix 4)
		<i>L_{Aeq}(15 min)</i>	<i>L_{A1}(1 min)</i>	
49	49	35	49	4 – di Rocco
47	47	35	49	5 – Keighran
44	44	35	49	6 – Swan
43	43	43	50	7 – Druitt
46	46	46	50	8 – May
45	45	45	52	9 – Jeans
40	40	40	52	11 – Jeans
43	43	43	52	18 – Jeans
44	44	44	52	20 – Knight and all other Chain Valley Bay residences

Note: The location of the land referred to in Table 1 is shown on the figure in Appendix 4.

Noise generated by the project is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time-to-time). Appendix 4A sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

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

This condition only has effect prior to recommencement of underground coal extraction at Mannering Colliery. At all other times, conditions 1 to 4 of Appendix 4B have effect in its place.

Noise Mitigation

- The Proponent **must** prepare a report on potential noise mitigation measures for noisy equipment and activities undertaken on the site to the satisfaction of the **Secretary**. This report must be:
 - prepared by a suitably qualified acoustic expert;
 - submitted to the **Secretary** by the end of September 2008; and
 - accompanied by an action plan for the implementation of any reasonable and feasible recommendations of the report.

Noise Monitoring

- The Proponent **must** prepare a Noise Monitoring Program for the project to the satisfaction of the **Secretary**. This program must:
 - be submitted to the **Secretary** by the end of September 2008;
 - be revised in consultation with the EPA and be submitted to the **Secretary** by the end of April 2016; and
 - include the use of **continuous and** attended noise monitoring measures to monitor the performance of the project.

The Proponent **must** implement the approved Noise Monitoring Program as approved from time to time by the **Secretary**.

SUBSIDENCE

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

APPENDIX 4A: NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Tables 1 and 2 in Appendix 4B are to apply under all meteorological conditions except the following:
 - (a) wind speeds greater than 3m/s at 10 metres above ground level;
 - (b) stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 m above ground level; or
 - (c) 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 **must** be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this approval.
4. This monitoring must be carried out at least once a month (at least two weeks apart) for the first 12 months following recommencement of underground coal extraction, and then quarterly thereafter, unless the Secretary directs otherwise.

Note: The Secretary may direct that the frequency of attended monitoring increase or decrease at any time during the life of the project.

5. Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), 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.

APPENDIX 4B: ALTERNATE NOISE CONDITIONS

- From the recommencement of underground coal extraction at Mannering Colliery until 18 months thereafter, the Proponent **must** ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land.

Table 1: Noise limits dB(A)

Day <i>L_{Aeq}(15 min)</i>	Evening <i>L_{Aeq}(15 min)</i>	Night		Location
		<i>L_{Aeq}(15 min)</i>	<i>L_{A1}(1 min)</i>	
40	40	40	49	4 – di Rocco
43	43	41	49	5 – Keighran
42	42	41	49	6 – Swan
39	39	39	47	7 – Druitt
46	46	46	47	8 – May
41	41	41	51	9 – Jeans
39	39	39	49	11 – Jeans
39	39	39	51	18 – Jeans
40	40	40	51	20 – Knight and all other Chain Valley Bay residences

Note: The location of the land referred to in Table 1 is shown on the figure in Appendix 4.

Noise generated by the project is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time-to-time). Appendix 4A sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

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

- Following the expiry of the 18 month period referred to in condition 1 above, the Proponent **must** ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 2 at any residence on privately-owned land.

Table 2: Noise limits dB(A)

Day <i>L_{Aeq}(15 min)</i>	Evening <i>L_{Aeq}(15 min)</i>	Night		Location
		<i>L_{Aeq}(15 min)</i>	<i>L_{A1}(1 min)</i>	
40	40	40	49	4 – di Rocco
41	41	41	49	5 – Keighran
41	41	41	49	6 – Swan
39	39	39	47	7 – Druitt
45	45	43	47	8 – May
41	41	41	51	9 – Jeans
39	39	39	49	11 – Jeans
39	39	39	51	18 – Jeans
40	40	40	51	20 – Knight and all other Chain Valley Bay residences

Note: The location of the land referred to in Table 2 is shown on the figure in Appendix 4.

Noise generated by the project is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time-to-time). Appendix 4A sets out

the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

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

3. The Proponent **must** prepare a report on all noise mitigation measures required to achieve the noise limits in Table 2 to the satisfaction of the Secretary. This report must:
 - (a) be prepared by a suitably qualified and experienced acoustic consultant whose appointment has been approved by the Secretary;
 - (b) be prepared in consultation with EPA, and submitted to the Department for approval within 6 months after recommencement of underground coal extraction; and
 - (c) include an action plan for the implementation of any reasonable and feasible recommendations of the report.

The Proponent **must** implement the noise mitigation measures prior to the expiry of the 18 month period referred to in condition 1 above.

4. The Proponent **must** prepare a Noise Compliance Report for the project to the satisfaction of the Secretary. The report must:
 - (a) be prepared by a suitably qualified acoustic consultant, whose appointment has been approved by the Secretary;
 - (b) be prepared in consultation with EPA, and be submitted for approval within 6 months of the expiry of the 18 month period referred to in condition 1 above; and
 - (c) investigate and evaluate the effectiveness of the noise mitigation measures required under condition 3 and compliance with the noise limits in Table 2.

Appendix C

EPL extract

Environment Protection Licence



Licence - 191

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.

This includes:

- the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

Appendix D

Calibration certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE No: 24152

EQUIPMENT TESTED: Sound Level Calibrator

Manufacturer: B & K
Type No: 4230 **Serial No:** 1276091
Owner: EMM Consulting
Level 1, 146 Hunter Street
Newcastle, NSW 2300

Tests Performed: Measured output pressure level was found to be:

Parameter	Pre-Adj	Adj Y/N	Output: (db re 20 μ Pa)	Frequency: (Hz)	THD&N (%)
Level 1:	NA	N	93.81	989.84	1.58
Level 2:	NA	N	NA	NA	NA
Uncertainty:			± 0.11 dB	$\pm 0.05\%$	$\pm 0.20\%$
Uncertainty (at 95% c.i.) k=2					

CONDITION OF TEST:

Ambient Pressure: 1004 hPa ± 1.5 hPa **Relative Humidity:** 47% $\pm 5\%$

Temperature: 20 $^{\circ}$ C $\pm 2^{\circ}$ C

Date of Calibration: 14/02/2019 **Issue Date:** 15/02/2019

Acu-Vib Test Procedure: AVP02 (Calibrators)

Test Method: AS IEC 60942 - 2017

CHECKED BY: *[Signature]* **AUTHORISED SIGNATURE:** *[Signature]*

Jack Kieft

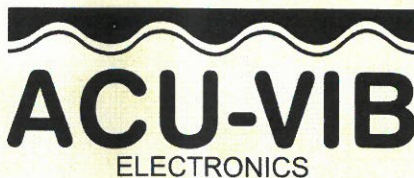
.Accredited for compliance with ISO/IEC 17025 - Calibration

The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

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%.



Accredited Lab. 9262
Acoustic and Vibration
Measurements



HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809806
Web site: www.acu-vib.com.au

CERTIFICATE OF CALIBRATION

No: CDK1902917

Page 1 of 12

CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2270	No: 3027603	Id: -
Microphone:	Brüel & Kjær Type 4189	No: 3195772	
Preamplifier:	Brüel & Kjær Type ZC-0032	No: 28589	
Supplied Calibrator:	None		
Software version:	BZ7222 Version 4.7.5	Pattern Approval:	PTB1.63-4093056 / 1.63-4093058
Instruction manual:	BE1712-22		

CUSTOMER

EMM Consulting
Suite 1, Level 10, 87 Wickham Terrace
4000 Spring Hill
Queensland, Australia

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C
Environment conditions: *See actual values in **Environmental conditions** sections.*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2270 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 8.0 - DB: 7.30) by using procedure B&K proc 2270, 4189 (IEC 61672:2013).


RESULTS


Calibration Mode: **Calibration as received.**

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: 2019-04-12

Date of issue: 2019-04-12


Susanne Jørgensen
Calibration Technician


Mikail Önder
Approved Signatory

CERTIFICATE OF CALIBRATION

CERTIFICATE No.: **SLM 22129 & FILT 4384**

Equipment Description: Sound Level Meter

Manufacturer: B & K

Model No: 2250 **Serial No:** 2759405

Microphone Type: 4189 **Serial No:** 2888134

Filter Type: 1/3 Octave **Serial No:** 2759405

Comments: All tests passed for class 1.
(See over for details)

Owner: EMGA Mitchell McLennan
Ground Floor, Suite 01, 20 Chandos St
St Leonards NSW 2065

Ambient Pressure: 1008 hPa \pm 1.5 hPa

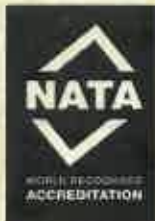
Temperature: 25 °C \pm 2° C **Relative Humidity:** 48% \pm 5%

Date of Calibration: 07/02/2018 **Issue Date:** 09/02/2018

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

CHECKED BY:  **AUTHORISED SIGNATURE:** 

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.



Accredited Lab. No. 9262
Acoustic and Vibration
Measurements



HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809806
web site: www.acu-vib.com.au

