RIX'S CREEK MINE

Monthly Compliance Noise Monitoring
October 2020

Prepared for:

Bloomfield Collieries
Four Mile Creek Road
Ashtonfield NSW 2323

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Bloomfield Collieries (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
630.12841-R16-v1.0	24 November 2020	Shannon Harvey	Martin Davenport	Martin Davenport

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1 Introduction

1.1 Background

Bloomfield Collieries Pty Ltd (Bloomfield) has commissioned SLR Consulting Australia Pty Ltd (SLR) to conduct night-time compliance noise monitoring of Rix's Creek Mine (the Mine).

The Mine is an open cut coal mine located approximately 5km north-west of Singleton in the Hunter Valley Coalfields of NSW. The Mine comprises the original Rix's Creek Mine and the former Vale Integra Open Cut Mine. The Mine operates under EPL 3391 but as the two previously mentioned mines operate under separate development approvals it is necessary to refer to the two parts of the Mine separately. In this compliance report the original Rix's Creek Mine is referred to as Rix's Creek South (RCS) and the former Vale Integra Open Cut Mine is referred to as Rix's Creek North (RCN).

Compliance noise monitoring of the Mine is guided by the relevant requirements of;

- Environment Protection Licence 3391 dated 23rd April 2019 (EPL 3391)
- Rix's Creek Mine Noise Management Plan dated 24th July 2019 (NMP)
- Rix's Creek North Project Approval PA 08_0102 MOD 8 dated 3rd April 2019 (PA 08_0102)
- Rix's Creek South Development Consent DA 49/94 Mod 10 dated June 2019 (DA 49/94)

This report presents the results and findings from the operator-attended noise survey conducted between Wednesday 21 October 2020 and Thursday 22 October 2020.

1.2 Objectives of this Report

The objectives of the noise monitoring survey for this month were:

- Conduct Attended Noise Compliance Monitoring in accordance with the Rix's Creek Mine NMP, the NSW Industrial Noise Policy (2000) and requirements as noted in the "Implementation and transitional arrangements for the Noise Policy for Industry (2017).
- Measure the ambient noise levels of at least six (6) noise sensitive locations surrounding the Mine during the night-period from 9:00PM to 7:00AM for a minimum of (thirty) 30 minutes at each location.
- Quantify all sources of noise within each of the attended surveys, including estimated contribution or maximum level of the individual noise sources.
- Assess the noise emissions of the mine and determine compliance with respect to the relevant conditions.

1.3 Acoustic Terminology

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

2 Rix's Creek Noise Criteria

RCS operations are subject to the conditions contained in DA 49/94 and EPL 3391. RCS criteria outlined in DA 49/94 is based on the LA10 descriptor and considered out of date. Therefore, the EPL 3391 noise criteria which have been updated to fit best practice are applied as the most relevant project criteria for RCS.

RCN operations are subject to the conditions contained in Schedule 3 of PA 08_0102 (**Appendix B**) and EPL3391. As the PA 08_0102 criteria are more stringent than EPL 3391, PA 08_0102 is applied as the most relevant project criteria for RCN.

The Rix's Creek Mine NMP encompasses the noise management and relevant criteria for RCS and RCN operations, coal handling, preparation and processing and rail loading across the entire site. The Rix's Creek Mine NMP consolidates all requirements and provides (Section 5) procedures to ensure monthly attended noise compliance monitoring is carried out effectively.

2.1 EPL Noise Limits – Rix's Creek Mine Operations

The figures presented in **Figure 1** are extracts from the EPL 3391.

Figure 1 Relevant EPL Noise Criteria

L3 Noise limits

L3.1 Noise generated at the premises must not exceed the noise limits in the Table below.

Location	Day/Evening/Night LAeq (15 minute)	Night LA1 (1 minute)
EPA 29 and NMG1	40	48
EPA 30 and NMG3	40	45
EPA 31 and NMG4	37	49
EPA 32 and NMG5	41	47
EPA 33 and NMG6	42	47
EPA 34 and NMG7	40	45
EPA 35 and NMG8	40	47
EPA 36 and NMG10	40	47
EPA 37 and NMG11	40	47
EPA 38 and NMG12	40	47

L3.2 For the purpose of condition L3.1:

a) EPA (number) refers to EPA identification point numbers as referenced in condition P1.4; and
b) NMG (number) refers to all residential receivers on land within noise monitoring groups identified by Figure 1.

L3.3 For the purpose of condition L3.1:

a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
b) Evening is defined as the period from 6pm to 10pm; and
c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

L3.4 The noise limits set out in condition L3.1 apply under all meteorological conditions except for the following:

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

L3.5 For the purposes of condition L3.4:

a) Data recorded by a meteorological station installed on the premises at EPA Identification Point 11 must be used to determine meteorological conditions; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L3.6 A non-compliance of condition L3.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at any location within the Noise Monitoring Groups defined in Condition L3.1.

L3.7 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

Definitions:

- *NSW Industrial Noise Policy refers to the document titled " New South Wales Industrial Noise Policy published by the EPA in January 2000.*
- *Noise refers to 'sound pressure levels' for the purpose of conditions L3.1 to L3.8.*

M9 Noise monitoring

M9.1 To assess compliance with condition L3.1, attended noise monitoring must be undertaken in accordance with conditions L3.6 and:

a) at a minimum of 6 locations from those listed condition P1.4 shown to be experiencing noise enhancing meteorological conditions;
b) occur every calendar month in a reporting period; and
c) occur during one night-time period as defined in the NSW Industrial Noise Policy for a minimum of 30 minutes at each location from a) during the night.

M9.2 Where required in writing by the EPA, the licensee must carry out monitoring to determine if the modification factors in Section 4 of the NSW Industrial Noise Policy need to be applied.

2.2 Rix's Creek North Project Approval

The noise limits specified for RCN can be found within the reproduced figures of relevant conditions from the Project Approval PA 08_0102 (MOD 8) in **Appendix B.**

2.3 Rix's Creek South Development Consent

The noise limits specified for RCS can be found within the reproduced extracts from the Development Consent DA 49/94 (MOD 10) in **Appendix C**.

2.4 Noise Limits at the Nominated Noise Monitoring Locations

The relevant conditions for RCS and RCN are presented in **Table 1**.

Table 1 Compliance Criteria

NMP ID	EA Ref. (RCN/RCS)[1]	Rix's Creek North		Rix's Creek South	
		$L_{Aeq(15minute)}$ dB	$L_{A1(1minute)}$ dB	$L_{Aeq(15minute)}$ dB	$L_{A1(1minute)}$ dB
NM01	132/171	38	48	40	48
NM03	63/NA	40	45	40	45
NM04	19/12	37	49	37	49
NM05	11/8	41	47	41	47
NM06	150/23	36	48	42	47
NM07	NA/61	NA	NA	40	45
NM08	NA/152	NA	NA	40	47
NM10	NA/126	NA	NA	40	47
NM11	NA/160	NA	NA	40	47
NM12	NA/168	NA	NA	40	47

Notes:

1. Criterion set as for Rix's Creek North in the absence of data in the EIS; and
2. "NA" indicates criteria not applicable at that location, as it was not included in the relevant EA, EIS or Project Approval

3 Noise Monitoring Methodology

3.1 General Requirements

The night-time Attended Noise Compliance Monitoring was conducted in accordance with Rix's Creek Mine NMP, the NSW Industrial Noise Policy (2000) and requirements as noted in the "Implementation and transitional arrangements for the Noise Policy for Industry (2017).

3.2 Rix's Creek Mine Noise Monitoring Locations

Residences surrounding the Mine have been grouped generally according to the locality and local acoustic environment. These groupings are referenced in the relevant EAs as Noise Assessment Groups (NAG). Monitoring locations, including the receptor reference numbers from the relevant EAs and the NAG each represents are listed below.

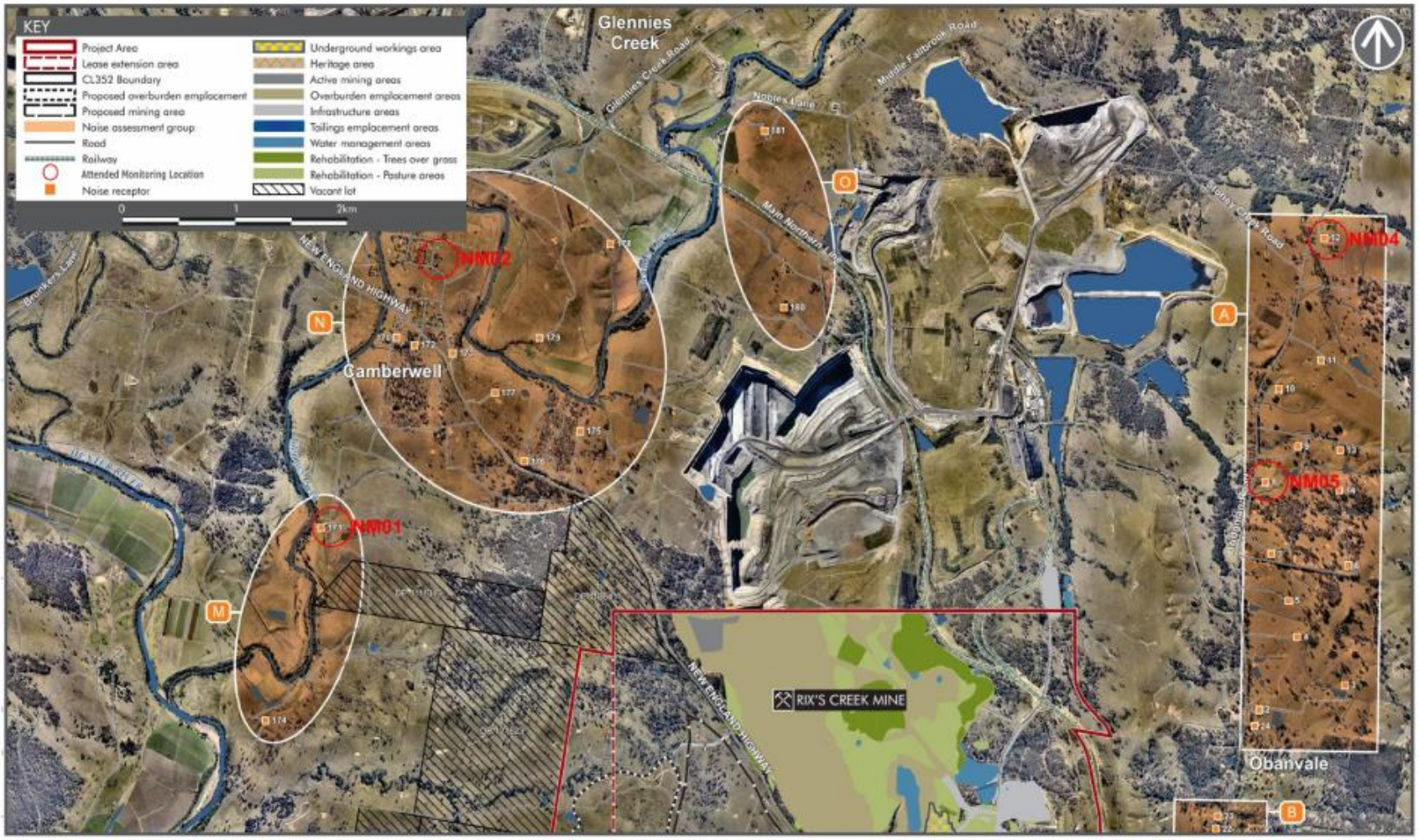
Table 2 Noise Attended Monitoring Locations

NMP ID	EA Ref. (ICO/RCM)[1]	Owner or Area	NAG[2]
NM01	132/171	Bowman	6 (RCN)/M (RCS)
NM03	63/NA	Cherry	B, C, F, 1, 6 and 12 (RCN)
NM04	19/12	Andrews	11 and A (RCN)/A (RCS)
NM05	11/8	Ferraro	10 and 11 (RCN)/A (RCS)
NM06	150/23	Bridgman Road	9 (RCN)/B and C (RCS)
NM07	NA/61	Gardiner Circuit	8 (RCN)/D and E (RCS)
NM08	NA/152	Belmadar Way	NA/J, G and F (RCS)
NM10	NA/126	Long Point	NA/K and I (RCS)
NM11	NA/160	320 Maison Dieu Road	NA/K (RCS)
NM12	NA/168	Corner of Maison Dieu Road and Shearers Lane	NA/L (RCS)

Notes: 1. NA indicates location was not included in the EA for that project; and
2. Indicates the NAG reference the location represents from the relevant EAs

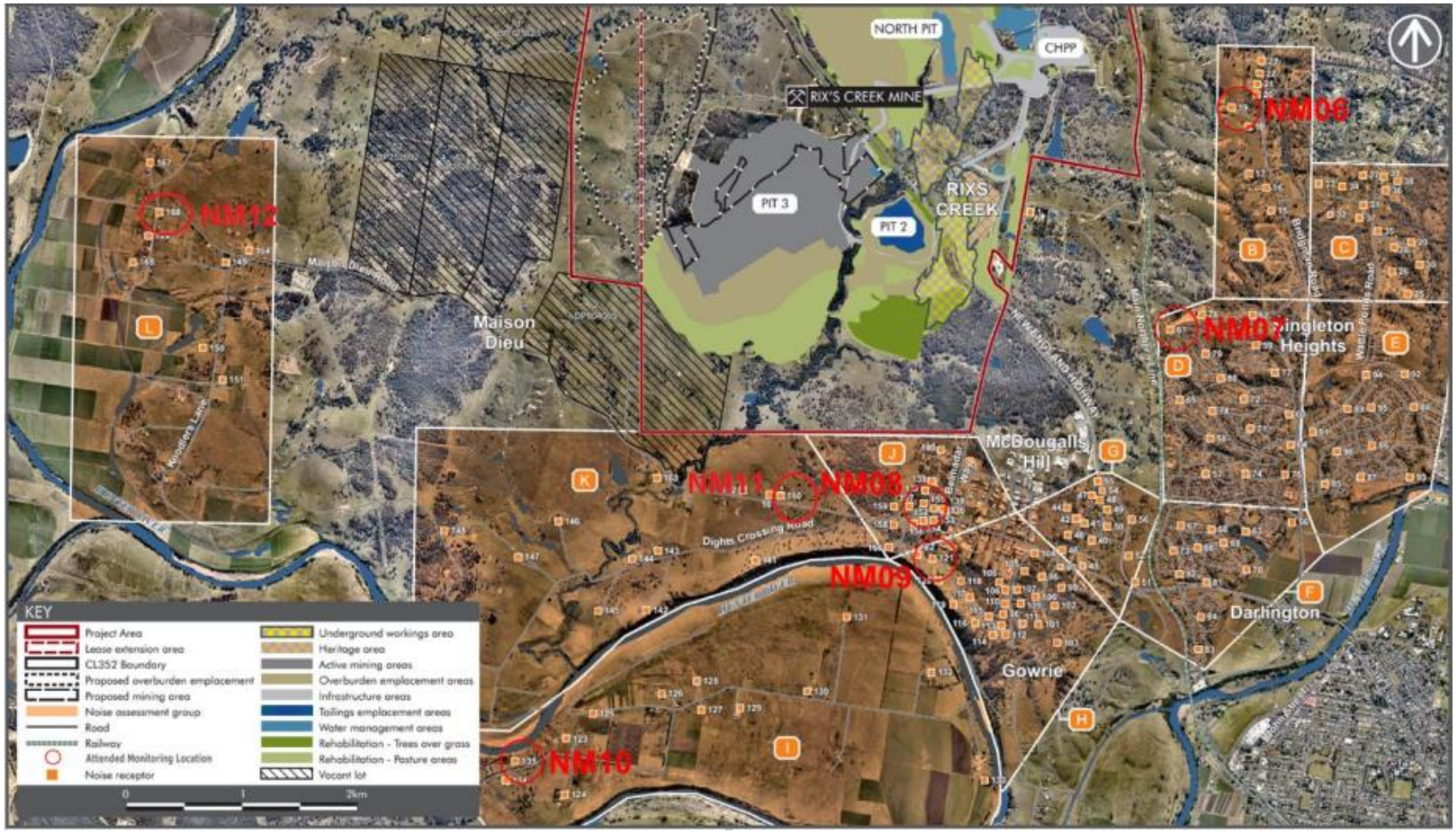
A site map sourced from the NMP and EPL 3391 identifying the assessment and noise monitoring locations are presented in **Figure 2**, **Figure 3** and **Figure 4.**

Figure 2 Noise Monitoring Locations North



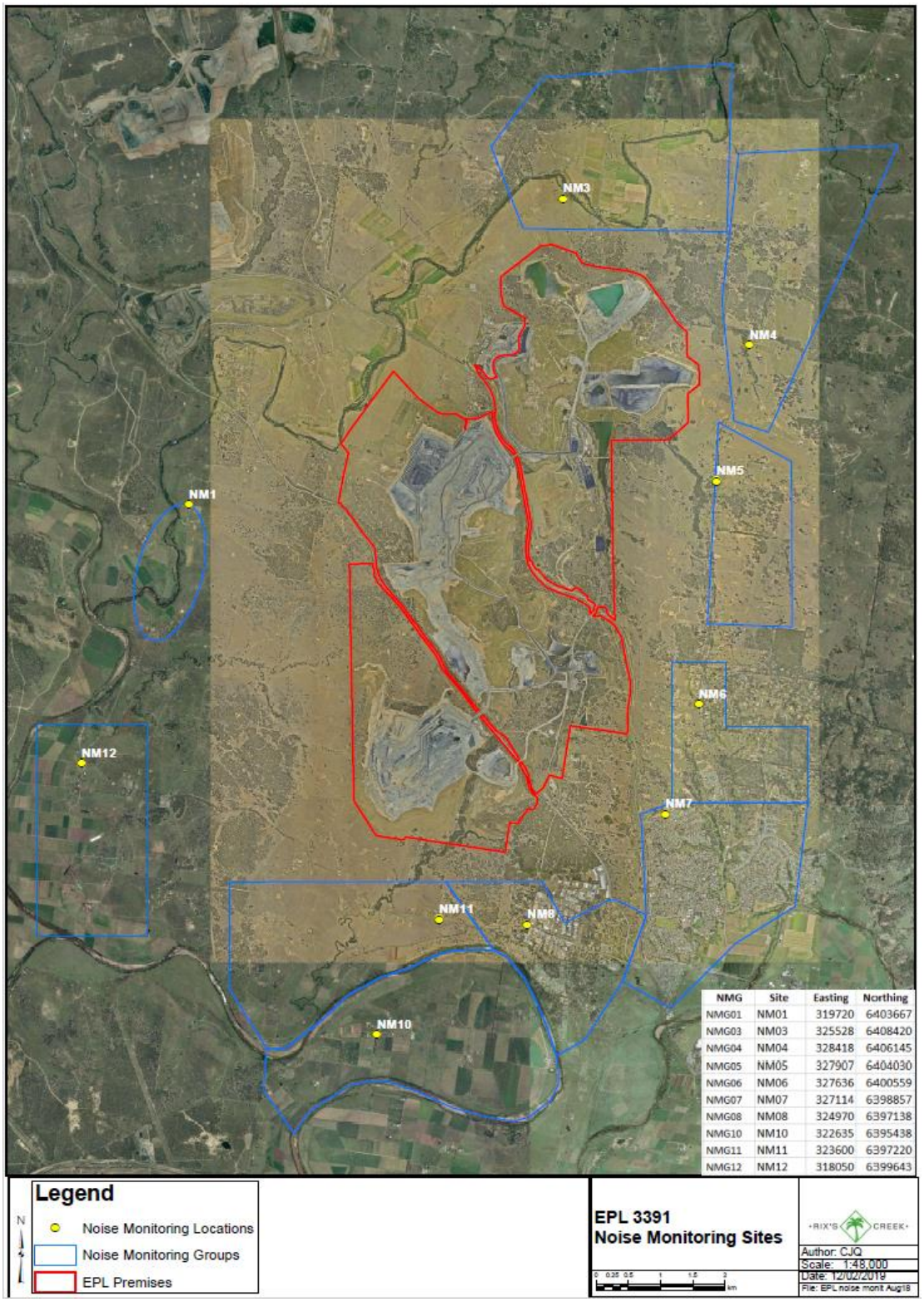
Source: Noise Monitoring Plan – Rix's Creek Mine

Figure 3 Noise Monitoring Locations South



Source: Noise Monitoring Plan – Rix's Creek Mine

Figure 4 Attended Noise Compliance Monitoring Sites



NMG	Site	Easting	Northing
NMG01	NM01	319720	6403667
NMG03	NM03	325528	6408420
NMG04	NM04	328418	6406145
NMG05	NM05	327907	6404030
NMG06	NM06	327636	6400559
NMG07	NM07	327114	6398857
NMG08	NM08	324970	6397138
NMG10	NM10	322635	6395438
NMG11	NM11	323600	6397220
NMG12	NM12	318050	6399643

Source: Rix's Creek Mine EPL 3391 - Figure 1

3.3 Noise Monitoring Location Selection

As per the NMP, the procedure stated below was used to select appropriate noise monitoring locations:

Compliance monitoring is to be conducted at locations indicated as being in the zone of meteorological enhancement by the predictive noise model. The procedure for determining which locations to monitor is as follows:

1. *The acoustic consultant undertaking the monitoring will access the predictive model website for the site for the upcoming night shift. The model results will indicate graphically the predicted zone of the meteorological enhancement;*

2. *A monitoring plan will be developed by the consultant for the upcoming night period. Locations are to include:*

    a. *If a clear zone of meteorological enhancement is indicated, one location in the opposite direction to the zone of predicted enhancement, and, all locations located within the predicted zone of enhancement; and*

    b. *If relatively neutral conditions are predicted with no clear zone of meteorological enhancement, the eight locations nearest the mine will be monitored. NM01, NM03 and NM10 would be excluded, as non-compliance at those locations in the absence of meteorological enhancement is unlikely due to distance from the Mine.*

3. *A minimum of six locations are to be monitored per night.*

3.4 Nominated Monitoring Locations

Night time attended noise compliance monitoring during October 2020 was conducted at six (6) locations. The details of the monitoring locations are given in **Table 3.**

Table 3 Attended Noise Monitoring Locations

Noise Monitoring Locations	EA Ref. (RCN/RCS)	Owner or Area
NM3	63/NA	Cherry
NM4	19/12	Andrews
NM5	11/8	Ferraro
NM6	150/23	Bridgman Road
NM7	NA/61	Gardiner Circuit
NM8	NA/152	Belmadar Way

4 Operator Attended Noise Monitoring

Operator attended noise surveys were conducted at each of the six (6) nominated noise monitoring locations during the night-time period from 9:00 PM to identify and quantify sources of noise that contributed to the overall ambient noise level. Two (2) 15 minute measurements were conducted at each site using an integrating sound level meter to observe condition M9.1 of EPL 3391 which requires a minimum of 30 minutes at each location.

4.1 Results of Operator Attended Noise Monitoring

Operator attended noise compliance monitoring commenced at 21:06 on Wednesday 21 October 2020 and the final noise survey commenced at 01:34 Thursday 22 October 2020. Operator attended noise surveys were conducted using a Brüel & Kjær Type 2250L (S/N 3003389).

Weather data during the monitoring period has been obtained from the weather station located on the Rix's Mine Creek Mine Weather Station site (EPL 3391 ID #11).

Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, and mine operations as well as any other industrial operations.

The tables provide the following information:

- Monitoring location.
- Date and start time.
- Wind velocity (m/s) and Temperature (ºC) at the measurement location.
- Typical maximum (L_{Amax}) and contributed noise levels.

Mine contributions listed in the tables are from Rix's Creek Mine and are stated only when a contribution could be quantified.

4.1.1 Operator-attended Noise Survey Results – NM01 'Bowman'

Results of the operator-attended noise surveys at NM01 are provided in **Table 4**. Monitoring location NM01 represents residential receptors located to the east of the mine.

Table 4 Location NM01

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (LAmax – dBA)
		LAmax	LA1	LA10	LA90	LAeq	
1	21/10/2020 23:44 16°C 2.5 m/s ESE	57	43	41	36	39	Road traffic 35-46 Frogs/insects 26-29 Train horn 51 **Rix's Creek** Not Measurable
		Estimated Rix's Creek Mine North Noise Contribution		**Estimated Rix's Creek Mine South Noise Contribution**			
	WS>3.0 m/s? No	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 38	Criteria Limit: 48	Criteria Limit: 40	Criteria Limit: 48		
		Not Measurable	Not Measurable	Inaudible	Inaudible		
2	22/10/2020 00:00 17°C 2.0 m/s SE	46	41	38	34	36	Road traffic 36-44 Train passby 35-37 Train horn 43-46 Frogs 26-30 **Rix's Creek** Not Measurable
		Estimated Rix's Creek North Contribution		**Estimated Rix's Creek South Contribution**			
	WS>3.0 m/s? No	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 38	Criteria Limit: 48	Criteria Limit: 40	Criteria Limit: 48		
		Not Measurable	Not Measurable	Inaudible	Inaudible		

4.1.1.1 Operator Attended Noise Survey Summary – NM01

RCN operations were not measurable with minimal contribution to the overall L_{Aeq} during both periods of the night-time noise monitoring surveys at this location.

Road traffic and rail traffic noise contributed to the overall ambient noise environment during the night-time operator attended noise survey at this location.

4.1.2 Operator-attended Noise Survey Results – NM03 'Cherry'

Results of the operator-attended noise surveys at NM03 are provided in **Table 5**. Monitoring location NM03 represents residential receptors located to the north of the site.

Table 5 Location NM03

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (LAmax – dBA)
		LAmax	LA1	LA10	LA90	LAeq	
1	21/10/2020 22:53 17°C 4.75 m/s ESE	60	43	39	30	36	Birds/bats 38-60 Exhaust clicks 35-51 Frogs 28 Other industry 30-35 Wind related noise 32-36 **Rix's Creek North** Audible – Engine noise 28-34
		Estimated Rix's Creek Mine North Noise Contribution		**Estimated Rix's Creek Mine South Noise Contribution**			
	WS>3.0 m/s? Yes	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 40	Criteria Limit: 45	Criteria Limit: 40	Criteria Limit: 45		
		30	34	Inaudible	Inaudible		
2	21/10/2020 23:11 17°C 1.75 m/s SSE	65	48	34	30	40	Birds 33-51 Frogs 26-28 Other industry 30-36 Distant road traffic 31-36 Vehicle passby 37-65 Wind related noise 30-35 Train horn 38-41 **Rix's Creek North** Audible – General mining operations 29-34
		Estimated Rix's Creek North Contribution		**Estimated Rix's Creek South Contribution**			
	WS>3.0 m/s? No	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 40	Criteria Limit: 45	Criteria Limit: 40	Criteria Limit: 45		
		29	34	Inaudible	Inaudible		

4.1.2.1 Operator Attended Noise Survey Summary – NM03

RCS operations were inaudible during both periods of the night-time noise monitoring surveys at this location. RCN operations were audible during both periods. RCN $L_{Aeq(15\ minute)}$ and $L_{A1(1minute)}$ was estimated to be 30dBA and 34 dBA during the first and 29 dBA and 34 dBA during the second survey.

Wind related noise, road traffic noise as well as noise from birds and other industry also contributed to the overall ambient noise environment during the night-time operator attended noise survey at this location.

4.1.3 Operator-attended Noise Survey Results – NM04 'Andrews'

Results of the operator-attended noise surveys at NM04 are provided in **Table 6**. Monitoring location NM04 represents residential receptors located to the east of the site.

Table 6 Location NM04

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (LAmax – dBA)
		LAmax	LA1	LA10	LA90	LAeq	
1	21/10/2020 22:02 17°C 4.75 m/s SE	82	64	41	27	54	Road traffic 35-82 Insects/frogs 28-31 Exhaust clicks 34-52 **Rix's Creek** Barely audible – Mine hum <25
		Estimated Rix's Creek Mine North Noise Contribution		**Estimated Rix's Creek Mine South Noise Contribution**			
	WS>3.0 m/s? Yes	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 36	Criteria Limit: 48	Criteria Limit: 42	Criteria Limit: 47		
		<25	<25	Inaudible	Inaudible		
2	21/10/2020 22:17 17°C 5.0 m/s SE	44	38	32	27	31	Road traffic 35-44 Insects/frogs 28-33 Bats 31-41 **Rix's Creek** Barely audible – Mine hum <25
		Estimated Rix's Creek North Contribution		**Estimated Rix's Creek South Contribution**			
	WS>3.0 m/s? Yes	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 36	Criteria Limit: 48	Criteria Limit: 42	Criteria Limit: 47		
		<25	<25	Inaudible	Inaudible		

4.1.3.1 Operator Attended Noise Survey Summary – NM04

RCS operations were inaudible during both periods of the night-time noise monitoring surveys at this location. RCN operations were barely audible during both operator attended noise surveys. RCN $L_{Aeq(15\ minute)}$ and $L_{A1(1minute)}$ was estimated to be <25dBA and <25 dBA during the first and <25 dBA and <25 dBA during the second survey.

Road traffic noise and noise from insects and frogs contributed to the overall ambient noise environment during the night-time operator attended noise survey at this location.

4.1.4 Operator-attended Noise Survey Results – NM05 'Ferraro'

Results of the operator-attended noise surveys at NM05 are provided in **Table 7**. Monitoring location NM05 represents residential receptors located to the east of the site.

Table 7 Location NM05

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (LAmax – dBA)
		LAmax	LA1	LA10	LA90	LAeq	
1	21/10/2020 21:06 18°C 4.75 m/s SE	83	79	55	38	63	Road traffic 50-83 Insects/frogs 40-45 **Rix's Creek** Inaudible
		Estimated Rix's Creek Mine North Noise Contribution		**Estimated Rix's Creek Mine South Noise Contribution**			
	WS>3.0 m/s? Yes	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 41	Criteria Limit: 47	Criteria Limit: 41	Criteria Limit: 47		
		Inaudible	Inaudible	Inaudible	Inaudible		
2	21/10/2020 21:22 18°C 5.0 m/s SE	87	79	61	38	64	Road traffic 50-87 Insects/frogs 38-45 **Rix's Creek** Inaudible
		Estimated Rix's Creek North Contribution		**Estimated Rix's Creek South Contribution**			
	WS>3.0 m/s? Yes	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: 41	Criteria Limit: 47	Criteria Limit: 41	Criteria Limit: 47		
		Inaudible	Inaudible	Inaudible	Inaudible		

4.1.4.1 Operator Attended Noise Survey Summary – NM05

Rix's Creek Mine operations remained inaudible during both periods of the night-time operator attended surveys at this location.

Road traffic noise and noise from insects and frogs contributed to the overall ambient noise environment during the night-time operator attended noise survey at this location.

4.1.5 Operator-attended Noise Survey Results – NM11 '320 Maison Dieu Road'

Results of the operator-attended noise surveys at NM11 are provided in **Table 8**. Monitoring location NM11 represents residential receptors located to the south of the site.

Table 8 Location NM11

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (LAmax – dBA)
		LAmax	LA1	LA10	LA90	LAeq	
1	22/10/2020 01:19 16°C 2.75 m/s SSE	48	37	35	32	33	Distant road traffic 35-37 Insects/frogs 30-33 Exhaust clicks 37-48 **Rix's Creek South** Audible – General mining operations 29-34
		Estimated Rix's Creek Mine North Noise Contribution		**Estimated Rix's Creek Mine South Noise Contribution**			
	WS>3.0 m/s? No	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: N/A	Criteria Limit: N/A	Criteria Limit: 40	Criteria Limit: 47		
		Inaudible	Inaudible	30	34		
2	22/10/2020 01:34 17°C 2.0 m/s ESE	77	47	35	31	48	Vehicle passby 35-77 Train passby 33-39 Insects/frogs 30-33 Other industry 26-29 **Rix's Creek South** Not Measurable
		Estimated Rix's Creek North Contribution		**Estimated Rix's Creek South Contribution**			
	WS>3.0 m/s? No	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: N/A	Criteria Limit: N/A	Criteria Limit: 40	Criteria Limit: 47		
		Inaudible	Inaudible	Not Measurable	Not Measurable		

4.1.5.1 Operator Attended Noise Survey Summary – NM11

RCS operations were inaudible during both periods of the night-time noise monitoring surveys at this location. RCN operations were audible during the first survey and not measurable during the second. RCN $L_{Aeq(15\ minute)}$ and $L_{A1(1minute)}$ was estimated to be 30 dBA and 34 dBA during the first survey.

Road and rail traffic noise as well as noise from insects and frogs also contributed to the overall ambient noise environment during the night-time operator attended noise survey at this location.

4.1.6 Operator-attended Noise Survey Results – NM12 'Corner of Maison Dieu Road and Shearers Lane'

Results of the operator-attended noise surveys at NM12 are provided in **Table 9**. Monitoring location NM12 represents residential receptors located to the south-west of the site.

Table 9 Location NM12

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (LAmax – dBA)
		LAmax	LA1	LA10	LA90	LAeq	
1	22/10/2020 00:39 16°C 1.5 m/s SSW	57	40	38	35	37	Residential air-con fan 33-34 Distant road traffic 34-36 Livestock 39-42 Birds/bats 34-57 Exhaust clicks 38-48 **Rix's Creek South** Audible – General mining operations 34-40
		Estimated Rix's Creek Mine North Noise Contribution		**Estimated Rix's Creek Mine South Noise Contribution**			
	WS>3.0 m/s? No	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: N/A	Criteria Limit: N/A	Criteria Limit: 40	Criteria Limit: 47		
		Inaudible	Inaudible	35	40		
2	22/10/2020 00:55 16°C 1.25 m/s NE	55	43	36	33	35	Residential air-con fan 33-34 Farming operations 40-41 Dog barking 35-48 Livestock 36-44 Birds/bats 36-55 **Rix's Creek South** Audible – General mining operations 33-36
		Estimated Rix's Creek North Contribution		**Estimated Rix's Creek South Contribution**			
	WS>3.0 m/s? No	LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)		
		Criteria Limit: N/A	Criteria Limit: N/A	Criteria Limit: 40	Criteria Limit: 47		
		Inaudible	Inaudible	34	36		

4.1.6.1 Operator Attended Noise Survey Summary – NM12

RCN operations were audible during both night-time noise monitoring surveys at this location. RCN $L_{Aeq(15\ minute)}$ and $L_{A1(1minute)}$ was estimated to be 35 dBA and 40 dBA during the first survey and 34 dBA and 36 dBA during the second.

Noise from residential air con fans, animal noise as well as distant road traffic noise also contributed to the overall ambient noise environment during the night-time operator attended noise survey at this location.

4.2 Compliance Assessment and Discussion of Results

4.2.1 Rix's Creek Mine Noise Compliance

Results of the operational noise compliance assessment are given in **Table 10** and **Table 11**.

Table 10 Rix's Creek North Compliance Noise Assessment – Operations

Location	Period	Estimated RCN Contribution		Criteria		Compliance	
		$L_{Aeq(15minute)}$	$L_{A1(1minute)}$	$L_{Aeq(15minute)}$	$L_{A1(1minute)}$	$L_{Aeq(15minute)}$	$L_{A1(1minute)}$
NM01 Bowman	1	NM	NM	38	48	Y	Y
	2	NM	NM			Y	Y
NM03 Cherry	1	30	34	40	45	Y	Y
	2	29	34			Y	Y
NM04 Andrews	1	<25	<25	37	49	Y	Y
	2	<25	<25			Y	Y
NM05 Ferraro	1	I/A[1]	I/A[1]	41	47	Y	Y
	2	I/A[1]	I/A[1]			Y	Y
NM11 320 Maison Dieu Road	1	I/A[1]	I/A[1]	N/A[3]	N/A[3]	Y	Y
	2	I/A[1]	I/A[1]			Y	Y
NM12 Corner of Maison Dieu Road and Shearers Lane	1	I/A[1]	I/A[1]	N/A[3]	N/A[3]	Y	Y
	2	I/A[1]	I/A[1]			Y	Y

Note 1. I/A – Inaudible

Note 2. N/M – Not measurable

Note 3. Location was not included in the EA for that project

Table 11 Rix's Creek South Compliance Noise Assessment – Operations

Location	Period	Estimated RCS Contribution		Criteria		Compliance	
		$L_{Aeq(15minute)}$	$L_{A1(1minute)}$	$L_{Aeq(15minute)}$	$L_{A1(1minute)}$	$L_{Aeq(15minute)}$	$L_{A1(1minute)}$
NM01 Bowman	1	I/A[1]	I/A[1]	40	48	Y	Y
	2	I/A[1]	I/A[1]			Y	Y
NM03 Cherry	1	I/A[1]	I/A[1]	40	45	Y	Y
	2	I/A[1]	I/A[1]			Y	Y
NM04 Andrews	1	I/A[1]	I/A[1]	37	49	Y	Y
	2	I/A[1]	I/A[1]			Y	Y
NM05 Ferraro	1	I/A[1]	I/A[1]	41	47	Y	Y
	2	I/A[1]	I/A[1]			Y	Y
NM11 320 Maison Dieu Road	1	30	34	40	47	Y	Y
	2	N/M[2]	N/M[2]			Y	Y
NM12 Corner of Maison Dieu Road and Shearers Lane	1	35	40	40	47	Y	Y
	2	34	36			Y	Y

Note 1. I/A – Inaudible

Note 2. N/M – Not measureable

Note 3. Location was not included in the EA for that project

4.2.2 Discussion of Results

Results presented in **Table 10** and **Table 11** indicates that noise levels from RCM complied with relevant criteria at all monitoring locations during the October 2020 monitoring survey.

5 Conclusion

SLR was engaged by Bloomfield Colliery Pty Limited to conduct monthly night time noise monitoring for the Rix's Creek Mine operations guided by the requirements of the Environment Protection License 3391, Rix's Creek Mine Noise Management Plan, Rix's Creek North Project Approval PA 08_0102 and Rix's Creek South Development Consent DA 49/94.

Operator-attended noise monitoring was conducted at six residential receiver locations between Wednesday 21 October 2020 and Thursday 22 October 2020 in order to determine the noise of the Rix's Creek Mine operations against the EPL 3391 and relevant Development Consent conditions.

Based on the measured Rix's Creek Mine noise contribution, compliance with the relevant noise limits were achieved at all noise monitoring locations for Rix's Creek North and Rix's Creek South under applicable weather conditions.

APPENDIX A

Acoustic Terminology

1. Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. The human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2 x 10^{-5} Pa.

2. 'A' Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an 'A-weighting' filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as 'linear', and the units are expressed as dB(lin) or dB.

3. Sound Power Level

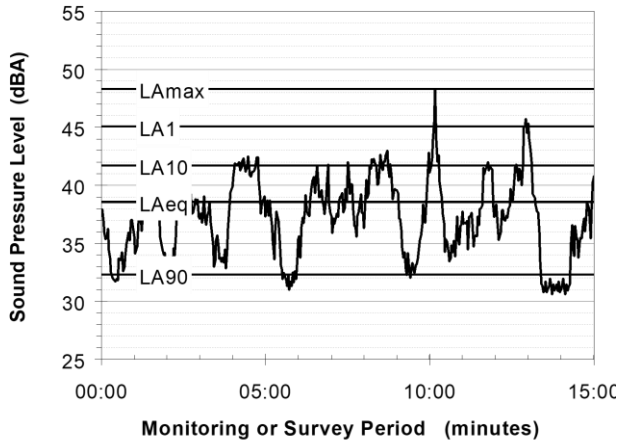
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure is similar to the effect of an electric radiator, which is characterised by a power rating but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4. Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

LA1 The noise level exceeded for 1% of the 15 minute interval.

LA10 The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

LA90 The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

LAeq The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

5. Frequency Analysis

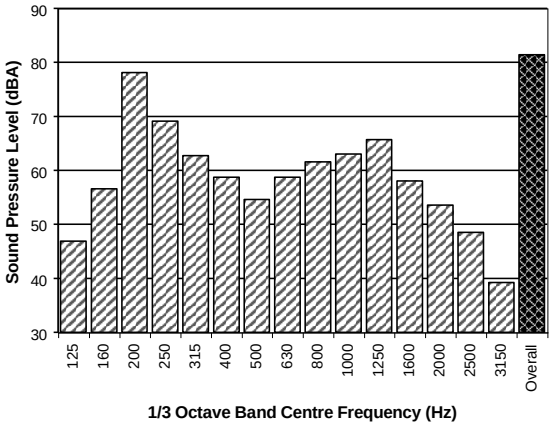
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (three bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



6. Annoying Noise (Special Audible Characteristics)

A louder noise will generally be more annoying to nearby receivers than a quieter one. However, noise is often also found to be more annoying and result in larger impacts where the following characteristics are apparent:

- **Tonality** - tonal noise contains one or more prominent tones (ie differences in distinct frequency components between adjoining octave or 1/3 octave bands), and is normally regarded as more annoying than 'broad band' noise.
- **Impulsiveness** - an impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.
- **Intermittency** - intermittent noise varies in level with the change in level being clearly audible. An example would include mechanical plant cycling on and off.
- **Low Frequency Noise** - low frequency noise contains significant energy in the lower frequency bands, which are typically taken to be in the 10 to 160 Hz region.

APPENDIX B

Rix's Creek North – PA 08_0102 – Schedule 3

Noise Criteria

Except for the land referred to in Table 1 for which the acquisition basis is noise, the Proponent must ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 2: Noise criteria dB(A)

Location		Day	Evening	Night	
		$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{A1(1min)}$
NAG 1	All privately-owned land	38	38	36	46
NAG 2	All privately-owned land	39	39	37	47
NAG 3	All privately-owned land	40	40	39	49
NAG 4	99, 100	39	39	39	47
	88, 91, 95	40	40	40	47
	105, 161	41	41	41	47
	All other privately-owned land	42	42	37	47
NAG 5	104	35	35	35	52
	139	36	36	36	52
	103	37	37	37	52
	121	40	40	40	52
	118, 154	43	43	43	52
	Deleted	45	45	45	52
	Deleted	47	47	47	52
	All other privately-owned land	50	46	42	52
NAG 6	137	35	35	35	48
	133	37	37	37	48
	132	38	38	38	48
	All other privately-owned land	41	41	38	48
NAG 7	All privately-owned land	45	42	39	49
NAG 8	142	35	35	35	45
	All other privately-owned land	42	42	35	45
NAG 9	146, 148, 149	35	35	35	48
	143, 144, 145, 147, 150, 151, 152	36	36	36	48
	2	37	37	37	48
	3, 4	39	39	39	48
	All other privately-owned land	40	40	38	48
NAG 10	5	40	40	40	47
	6, 11	41	41	41	47
	8	42	42	42	47
	All other privately-owned land	39	39	37	47
NAG 11	18	35	35	35	49
	20, 21	37	37	36	49
	19	37	37	37	49
	17	38	38	38	49
	7	39	39	39	49
	12, 15	40	40	40	49
	14, 16	42	42	42	49
	All other privately-owned land	41	41	39	49

NAG 12	52, 55	35	35	35	45
	51, 56	37	37	37	45
	53, 57	38	38	38	45
	50, 54	39	39	39	45
	62	40	40	40	45
	All other privately-owned land	38	38	35	45
NAG A	24, 25, 26, 27, 28, 29, 30, 36, 37, 38, 39, 40, 41	35	35	35	46
	31	36	36	35	46
	42, 43	36	36	36	46
	32	37	37	35	46
	22, 23	37	37	37	46
	34	39	39	36	46
	35	39	39	35	46
	All other privately-owned land	39	39	36	46
NAG B	All privately-owned land	37	37	35	45
NAG C	47	39	39	39	45
	63	40	40	40	45
	All other privately-owned land	37	37	35	45
NAG D	44, 48	36	36	36	48
	49	39	39	39	48
	All other privately-owned land	40	40	38	48
NAG F	65, 66	39	39	39	50
	67	40	40	40	50
	68	42	42	42	50
	All other privately-owned land	40	40	40	50
NAG G	All privately-owned land	41	41	39	50
All other privately-owned land		35	35	35	45

However, these criteria do not apply if the Proponent, or another mining company, has acquired the land or if the Proponent has a written agreement with the relevant landowner to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

Noise generated by the project is to be measured in accordance with the relevant requirements of the INP. Appendix 5 sets out the requirements for evaluating compliance with these criteria.

Note: To interpret the locations referred to in Table 2, see the applicable figures in Appendix 4.

Noise Acquisition Criteria

3. If noise generated by the project exceeds the criteria in Table 3 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, then upon receiving a written request for acquisition from the owner, the Proponent must acquire the land in accordance with the procedures in conditions 7 and 8 of Schedule 4.

Table 3: Noise acquisition criteria dB(A)

Location	***Day***	***Evening***	***Night***
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$
All privately-owned land in NAG 1	44	44	42
All privately-owned land in NAG 2	45	45	43
All privately-owned land in NAG 3	46	46	45
All privately-owned land in NAG 4	48	48	43
All privately-owned land in NAG 5	56	52	48
All privately-owned land in NAG 6	47	47	44

All privately-owned land in NAG 6	47	47	44
All privately-owned land in NAG 7	51	48	45
All privately-owned land in NAG 8	48	48	41
All privately-owned land in NAG 9	46	46	44
All privately-owned land in NAG 10	45	45	43
All privately-owned land in NAG 11	47	47	45
All privately-owned land in NAG 12	44	44	41
All privately-owned land in NAG A	45	45	42
All privately-owned land in NAG B	43	43	41
All privately-owned land in NAG C	43	43	41
All privately-owned land in NAG D	46	46	44
All privately-owned land in NAG F	46	46	46
All privately-owned land in NAG G	47	47	45
All other privately-owned land	41	41	41

Noise generated by the project is to be measured in accordance with the relevant requirements of the INP. Appendix 5 sets out the requirements for evaluating compliance with these criteria.

Notes:

- *To interpret the locations referred to in Table 3, see the applicable figures in Appendix 4; and*
- *For this condition to apply, the exceedances of the criteria must be systemic.*

Cumulative Noise Criteria

4. The Proponent must implement all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines in the vicinity does not exceed the criteria in Table 4 at any residence on privately-owned land or on more than 25 percent of any privately-owned land (except for the residential receivers in Table 1 for which the acquisition basis is noise). The Proponent must share the costs associated with implementing these measures on as equitable basis as possible with the relevant mines.

Table 4: Cumulative noise criteria dB(A) $L_{Aeq\ (period)}$

Location	Day	Evening	Night
NAGs 4, 5, 8 and 9	55	45	40
All other privately-owned land	50	45	40

Cumulative noise is to be measured in accordance with the relevant requirements of the INP. Appendix 5 sets out the requirements for evaluating compliance with these criteria.

For the purposes of this condition, 'reasonable and feasible avoidance and mitigation measures' includes, but is not limited to, the requirements in conditions 9 and 10 to develop and implement a real-time noise management system that ensures effective operational response to the risk of exceedance of the criteria.

Note: To identify the locations referred to in Table 4, see the figures in Appendix 4.

Cumulative Noise Acquisition Criteria

5. If the noise generated by the project combined with the noise generated by other mines in the vicinity exceeds the criteria in Table 5 at any residence on privately-owned land or on more than 25 percent of privately-owned land (except for the residential receivers in Table 1 for which the acquisition basis is noise), then upon receiving a written request for acquisition from the landowner, the Proponent must acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 7 and 8 of Schedule 4.

Table 5: Cumulative noise acquisition criteria dB(A) $L_{Aeq\ (period)}$

Location	*Day*	*Evening*	*Night*
NAGs 4, 5, 8 and 9	60	50	45
All other privately-owned land	55	50	45

Cumulative noise is to be measured in accordance with the relevant requirements of the INP. Appendix 5 sets out the requirements for evaluating compliance with these criteria.

Notes:

- *To interpret the locations referred to in Table 5, see the applicable figures in Appendix 4; and*
- *For this condition to apply, the exceedances of the criteria must be systemic.*

Additional Noise Mitigation Measures

6. Upon receiving a written request from the owner of any residence:
   (a) on the land listed in Table 1 for which the acquisition basis is noise; or
   (b) on land listed in Table 6; or
   (c) on privately-owned land where subsequent noise monitoring shows the noise generated by the project is greater than or equal to the criteria in Table 7,

the Proponent must implement additional noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the landowner.

If within 3 months of receiving this request from the owner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 6: Land where additional noise mitigation measures are available on request

5 – D P Cox	6 – W G Cox
8 – DK Geelan	16 – A Lambkin
14 – M Hoggan	31 – C Craven
20 – Mr Garvie	48 - G Cheetham
32 – M Langdon	50 – D & M Bridge
47 – B & R Cherry	54 – G Holmes
53 – K & J Badior	63 – J & M Moore
62 – D Moran	95 – J & T Clarke
91 – T & D Olofsson	161 – V Lopes
105 – J & G McInerney	363 – D & L Bynon

Note: To interpret the locations referred to in Table 6, see the applicable figures in Appendix 4.

Table 7: Additional noise mitigation criteria dB(A)

Location	***Day***	***Evening***	***Night***
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$
All privately-owned land in NAG 1	41	41	39
All privately-owned land in NAG 2	42	42	40
All privately-owned land in NAG 3	43	43	42
All privately-owned land in NAG 4	45	45	40
All privately-owned land in NAG 5	53	49	45
All privately-owned land in NAG 6	44	44	41
All privately-owned land in NAG 7	48	45	42
All privately-owned land in NAG 8	45	45	38
All privately-owned land in NAG 9	43	43	41
All privately-owned land in NAG 10	42	42	40
All privately-owned land in NAG 11	44	44	42
All privately-owned land in NAG 12	41	41	38
All privately-owned land in NAG A	42	42	39
All privately-owned land in NAG B	40	40	38
All privately-owned land in NAG C	40	40	38
All privately-owned land in NAG D	43	43	41
All privately-owned land in NAG F	43	43	43
All privately-owned land in NAG G	44	44	42
All other privately-owned land	38	38	38

Cumulative noise is to be measured in accordance with the relevant requirements of the INP. Appendix 5 sets out the requirements for evaluating compliance with these criteria.

Notes:

- *To interpret the locations referred to in Table 7, see the applicable figures in Appendix 4; and*
- *For this condition to apply, the exceedances of the criteria must be systemic.*

7. If the cumulative noise generated by the project combined with the noise generated by other mines in the vicinity exceeds the criteria at any residence on the land referred to in Table 8, then upon receiving a written request from the owner, the Proponent must implement additional noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the landowner. The Proponent must share the costs associated with implementing these measures on as equitable basis as possible with the relevant mines.

If within 3 months of receiving this request from the owner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 8: Cumulative noise mitigation criteria dB(A) $L_{Aeq\ (period)}$

Location	Day	Evening	Night
NAGs 4, 5, 8 and 9	57	47	42
All other privately owned land	52	47	42

Cumulative noise is to be measured in accordance with the relevant requirements of the INP. Appendix 5 sets out the requirements for evaluating compliance with these criteria.

Notes:
- *To interpret the locations referred to in Table 8, see the applicable figures in Appendix 4; and*
- *For this condition to apply, the exceedances of the criteria must be systemic.*

Rail Noise

8. The Proponent must seek to ensure that its rail spur is only accessed by locomotives that are approved to operate on the NSW rail network in accordance with noise limits L6.1 to L6.4 in RailCorp's EPL (No. 12208) and ARTC's EPL (No. 3142) or a Pollution Control Approval issued under the former *Pollution Control Act 1970*.

Operating Conditions

9. The Proponent must:
   (a) implement best practice noise management, including all reasonable and feasible noise mitigation measures, to minimise the operational, low frequency, and rail noise generated by the project at all times, including during temperature inversions;
   (b) operate a comprehensive noise management system that uses a combination of predicted meteorological forecasting and real-time noise monitoring data to guide the day-to-day planning of mining operations and the implementation of both proactive and reactive mitigation measures to ensure compliance with the relevant conditions of this approval;
   (c) maintain or improve the effectiveness of noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired;
   (d) ensure that noise attenuated plant is deployed preferentially in locations relevant to sensitive receivers;
   (e) minimise the noise impacts of the project during meteorological conditions under which data is to be excluded for the purposes of assessing compliance with these conditions (see Appendix 5); and
   (f) co-ordinate the noise management on site with noise management at nearby mines (including Integra Underground, Ashton, Rix's Creek South and the Mount Owen Complex) to minimise cumulative noise impacts,

   to the satisfaction of the Secretary.

Noise Management Plan

10. The Proponent must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:
   (a) be prepared in consultation with the EPA, and then submitted to the Secretary for approval;
   (b) describe the measures that would be implemented to ensure:
      - compliance with the noise criteria and operating conditions of this approval; and
      - best management practice is being employed;
   (c) describe the noise management system in detail;
   (d) include a noise monitoring program that:
      - uses a combination of real-time and supplementary attended monitoring measures to evaluate the performance of the project;
      - includes a protocol for determining exceedances of the relevant conditions in this approval;
      - evaluates and reports on the effectiveness of the noise management system and the best practice noise management measures; and
   (e) includes a protocol that has been prepared in consultation with the owners of nearby mines (including Integra Underground, Ashton, Rix's Creek South and the Mount Owen Complex) to minimise the cumulative noise impacts of the mines.

   The Proponent must implement the management plan as approved by the Secretary.

APPENDIX C

Rix's Creek North – DA 49/94 – Schedule 2

Noise Criteria

10. The Applicant must
    (i) comply with L_A 10 daytime noise level design goals set out below:

The Retreat	42dB(A)
Singleton Heights	42dB(A)
Maison Dieu Road	38dB(A)

    (ii) comply with L_A I0 night time noise level design goals set out below:

The Retreat	40dB(A)
Singleton Heights	40dB(A)
Maison Dieu Road	38dB(A)

Appendix 4 sets out the requirements for evaluating compliance with these criteria.

Operating Conditions

10A. The Applicant must:
    (i) implement best practice noise management, including all reasonable and feasible noise mitigation measures, to minimise the operational, low frequency, and rail noise generated by the project at all times, including during temperature inversions;
    (ii) operate a comprehensive noise management system that uses a combination of predicted meteorological forecasting and real-time noise monitoring data to guide the day-to-day planning of mining operations and the implementation of both proactive and reactive mitigation measures to ensure compliance with the relevant conditions of this approval;
    (iii) maintain or improve the effectiveness of noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired;
    (iv) ensure that noise attenuated plant is deployed preferentially in locations relevant to sensitive receivers;
    (v) minimise the noise impacts of the project during meteorological conditions under which data is to be excluded for the purposes of assessing compliance with these conditions (see Appendix 4); and
    (vi) co-ordinate the noise management on site with noise management at nearby mines (including Integra Underground, Ashton, Rix's Creek North and the Mount Owen Complex) to minimise cumulative noise impacts,

    to the satisfaction of the Secretary.

(iv) include a noise monitoring program that:
- uses a combination of real-time and supplementary attended monitoring measures to evaluate the performance of the project;
- includes a protocol for determining exceedances of the relevant conditions in this approval;
- evaluates and reports on the effectiveness of the noise management system and the best practice noise management measures; and

(v) includes a protocol that has been prepared in consultation with the owners of nearby mines (including Integra Underground, Ashton, Rix's Creek North and the Mount Owen Complex) to minimise the cumulative noise impacts of the mines.

The Applicant must implement the approved management plan as approved from time to time by the Secretary.

11A. Prior to construction of the rail loop and rail spur, the Applicant must:
(i) prepare (and during construction implement) a Construction Noise Management Plan prepared in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) (or any relevant updated version), to the satisfaction of the Secretary; and
(ii) install temporary noise barriers in a suitable location to minimise noise impacts resulting from construction of the southern section of the rail spur, unless otherwise agreed by the Secretary.

11B. The Applicant must ensure that construction activities are restricted to standard construction hours specified in the *Interim Construction Noise Guideline* (DECC, 2009). If works are required outside standard construction hours, the Applicant must consult with the community and seek approval from the Secretary prior to commencement of construction.

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