

Noise Monitoring Assessment

Dargues Gold Mine
Majors Creek, NSW.
Quarter Ending, June 2022

Document Information

Noise Monitoring Assessment

Dargues Gold Mine, Majors Creek, NSW

Quarter Ending, June 2022

Prepared for: Aurelia Metals Ltd

Dargues Gold Mine

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Majors Creek NSW 2622



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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Aurelia Metals Ltd to complete a quarterly Noise Monitoring Assessment (NMA) for Dargues Gold Mine, Majors Creek, NSW (the 'mine').

The monitoring has been conducted in accordance with Condition L2 of the Environmental Protection Licence (EPL) #20095, and in accordance with the site's Noise Management Plan (NMP) 20170123, at five representative monitoring locations. This assessment has been undertaken during Quarter 2, 2022 on Thursday 28 April 2022 and Friday 29 April 2022 and forms part of the noise monitoring program to address relevant conditions.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA), Environment Protection Licence EPL #20095 (EPL);
- Dargues Gold Mine Noise Management Plan (NMP) 20170123;
- Dargues Gold Mine Project Approval, 10_0054; and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

Unattended road traffic noise measurement charts for this assessment are presented in **Appendix B**.

Monthly unattended noise monitoring summary reports are presented in **Appendix C**.

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2 Noise Criteria

2.1 Operational Noise Criteria

Section L2 of the project's EPL (EPL #20095) outlines the applicable operational noise criteria for all privately owned residential receivers surrounding the mine. The criteria outlined in the EPL is reproduced below:

L2.1 Noise from the premises must not exceed the sound pressure level (noise) limits presented in the Table below. Note that the limits apply to the operation of the project and represent the sound pressure level (noise) contribution, at the nominated receiver locations in the table.

Table 1 summaries the applicable noise criteria at the five monitoring locations in accordance with the sites EPL and NMP.

Table 1 Noise Monitoring Program				
Monitoring Location	Noise Criteria, dBA LAeq(15min)			Noise Criteria, dB LA1(1min)
	Day	Evening	Night	Night
	(7am to 6pm)	(6pm to 10pm)	(10pm to 7am)	(10pm to 7am)
At any residence	35	35	35	45
Majors Creek State Conservation Area (when in use by any person)	35	35	35	45

L2.2 For the purpose of Noise Limit Conditions above:

'Day' is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays;

'Evening' is defined as the period from 6pm to 10pm on any day; and

'Night' is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L2.3 The noise emission limits identified in the table above apply under meteorological conditions of:

a) Wind speeds up to 3 m/s at 10m above ground level; or

b) temperature inversion conditions of up to 3 °C/100m and wind speeds up to 2 m/s at 10m above ground level

L2.4 For the purpose of the Condition L4.3:

a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station established at the premises for the purposes of this Environment Protection Licence ("Point 59" as outlined in Weather Monitoring conditions below)

b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the New South Wales Industrial Noise Policy (EPA 2000).

L2.5 Determining Compliance

To determine compliance:

a) with the $L_{eq}(15 \text{ minute})$ noise limits in the Noise Limits table, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 meters or less from the property boundary closest to the premises; or

ii) within 30 meters of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 meters from the property boundary closest to the premises; or, where applicable

iii) within approximately 50 meters of the boundary of a National Park, Nature Reserve or State Conservation Area.

b) with the $LA1(1 \text{ minute})$ noise limits in the Noise Limits table, the noise measurement equipment must be located within 1 meter of a dwelling façade.

c) with the noise limits in the Noise Limits table, the noise measurement equipment must be located:

i) at the most affected point at a location where there is no dwelling at the location; or

ii) at the most affected point within an area at a location prescribed by part (a) or part (b) of this condition.

L2.6 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.

L2.7A breach of this license will still occur where noise generated from the premises in excess of the appropriate limit is measured: i) at a location other than an area prescribed in part (a) and part (b) of Condition L4.5; and/or ii) at a point other than the most affected point at a location.

MAC Technical Note: For sleep disturbance, the $LA1(1 \text{ minute})$ descriptor is meant to represent a maximum noise level measured under 'fast' time response. DEC will accept analysis based on either $LA1(1 \text{ minute})$ or $LA(max)$.

2.2 Road Noise Criteria

Section 2.2.2 of the NSW Road Noise Policy specifies noise criteria for principal haulage routes applicable to off-site traffic from the mine and are reproduced in **Table 2**.

Table 2 Traffic Noise Impact Assessment Criteria dB(A)		
Road	Assessment Criteria - dBA	
	Day (7am to 10pm)	Night (10pm to 7am)
Majors Creek Road, Araluen Road, Captains	60dBA	55dBA
Flat Road, Coghill Street and Wallace Street	LAeq(15hour)	LAeq(9hour)

Note: The noise generated by the project is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy.

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3 Methodology

All attended noise surveys for this assessment were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the EPL.

The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dBA. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

3.1 Operator Attended Noise Measurement Methodology

The locality surrounding the mine is primarily rural/residential. Operator attended noise monitoring was undertaken at five representative receivers outlined in the mine's NMP and are presented in **Table 3**.

Monitoring Location	Resident Identifier	Coordinates (GDA94-MGA55)	
		Easting	Northing
NM1	R29	748148	6061931
NM2	R108	747454	6062651
NM3	R20	748672	6061250
NM5	R27	748998	6061467
NM6	R34	751242	6064950

Note 1: As per the Mine's NMP.

The receiver locations and unattended noise measurement location are presented in **Figure 1**.

Attended measurements were carried out using a Svantek Type 1, 971 noise analyser on Thursday 28 April 2022. Where possible throughout each survey the operator quantified the contribution of any significant noise sources.

3.2 Unattended Operational and Road Noise Assessment Methodology

Unattended road traffic noise monitoring was conducted on the boundary of 664 Majors Creek Road, Jembaicumbene, NSW (R34) using a Svantek Type 1, 977 noise analyser between Thursday 28 April 2022 and Friday 29 April 2022. Noise levels obtained at the monitoring location are considered representative of 664 Majors Creek Road, Jembaicumbene, NSW.

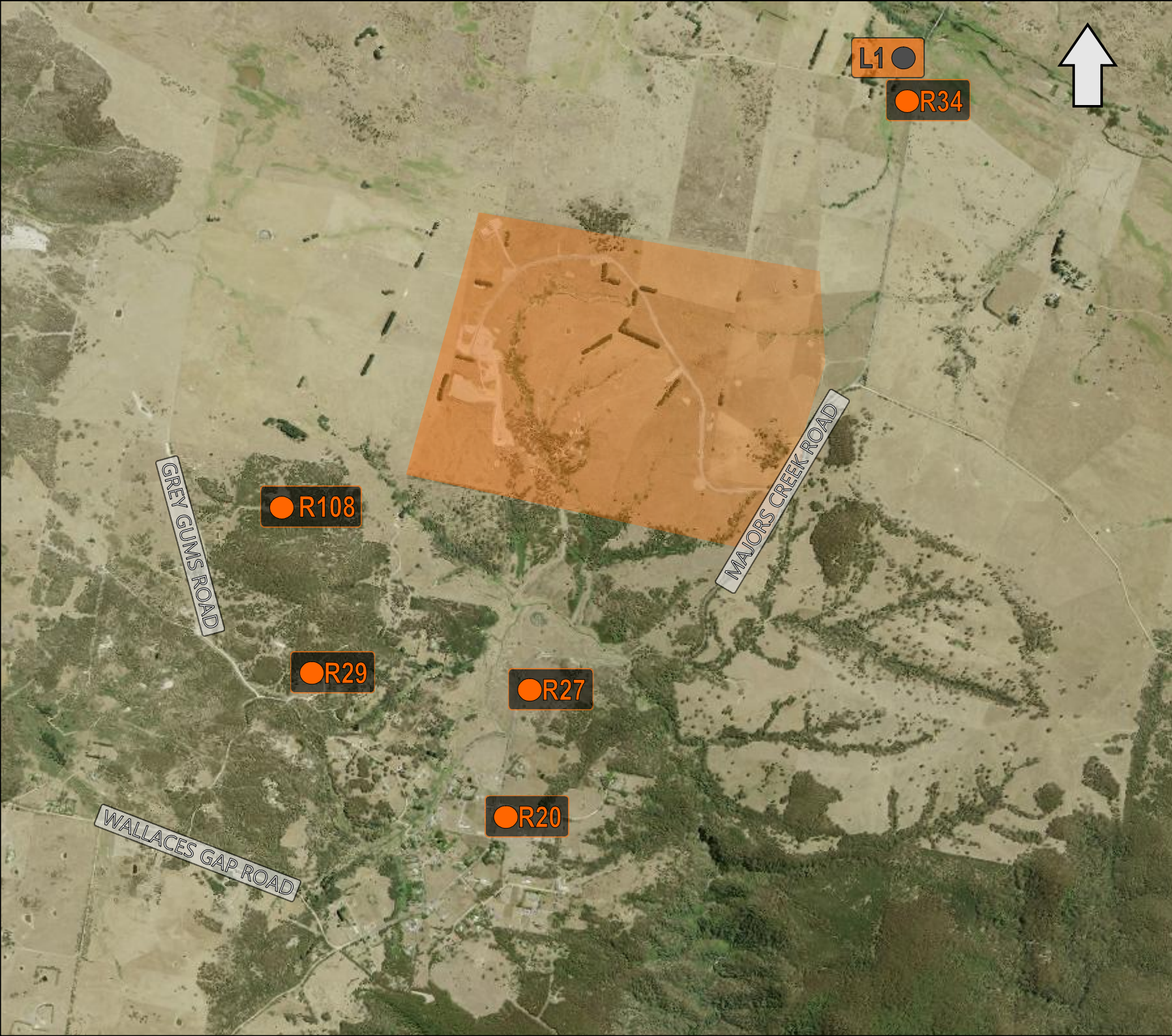


FIGURE 1
LOCALITY PLAN
REF: MAC201092



KEY	
	UNATTENDED LOCATION
	RECEIVER LOCATION
	SITE LOCATION



Imagery Source: Google Earth

4 Results

4.1 Assessment Results – Location R20

The results of the attended noise measurements at location R20 for the April 2022 survey are summarised in **Table 4** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 4 Operator-Attended Noise Survey Results – Location R20

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology ¹	Description and SPL, dBA	
		L _{Amax}	L _{Aeq}	L _{A90}				
28/04/2022 (Day)	12:33	78	58	36	35	WD: N WS: 1.9m/s Rain: Nil	Traffic 38-78	
							Birds 40-54	
							Insects <38	
							Wind in trees 39-42	
							Dog bark 49-56	
							DGM inaudible	
							Dargues Site L _{Aeq} (15min) Contribution	<26
Dargues Site L _{Amax} Contribution	<26							
28/04/2022 (Evening)	20:39	80	53	31	35	WD: NNW WS: 0.9m/s Rain: Nil	Insects 28-31	
							Traffic 30-80	
							Aircraft 33-39	
							DGM inaudible	
							Dargues Site L _{Aeq} (15min) Contribution	<21
							Dargues Site L _{Amax} Contribution	<21
							28/04/2022 (Night)	22:41
Livestock 31-59								
Wind in trees 31-36								
DGM inaudible								
Dargues Site L _{Aeq} (15min) Contribution	<23							
Dargues Site L _{Amax} Contribution	<23							

Note 1: Meteorology data obtained from DGM onsite weather station.

4.2 Assessment Results – Location R27

The results of the attended noise measurements at location R27 for the April 2022 survey are summarised in **Table 5** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 5 Operator-Attended Noise Survey Results – Location R27							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology ¹	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}			
28/04/2022 (Day)	12:11	79	56	38	35	WD: N WS: 1.6m/s Rain: Nil	Traffic 35-79
							Insects <35
							Wind in trees 36-42
							DGM alarms barely audible
Dargues Site L _{Aeq} (15min) Contribution							<28
Dargues Site L _{Amax} Contribution							<28
28/04/2022 (Evening)	20:21	71	47	27	35	WD: NNW WS: 1.2m/s Rain: Nil	Insects 24-37
							Traffic 30-71
							DGM inaudible
							Dargues Site L _{Aeq} (15min) Contribution
Dargues Site L _{Amax} Contribution							<20
28/04/2022 (Night)	23:01	46	35	26	35	WD: N WS: 1m/s Rain: Nil	Insects 23-36
							Wind in trees 23-32
							Livestock 38-46
							DGM hum <24
Dargues Site L _{Aeq} (15min) Contribution							<24
Dargues Site L _{Amax} Contribution							<24

Note 1: Meteorology data obtained from DGM onsite weather station.

4.3 Assessment Results – Location R29

The results of the attended noise measurements at location R29 for the April 2022 survey are summarised in **Table 6** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 6 Operator-Attended Noise Survey Results – Location R29							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology ¹	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}			
28/04/2022 (Day)	12:55	59	38	30	35	WD: NNW WS: 1.4m/s Rain: Nil	Birds 39-53
							Wind in trees 30-32
							Insects <29
							Dog bark 35-59
DGM mobile plant 32-34 (3 minutes)							
Dargues Site L _{Aeq} (15min) Contribution							<26
Dargues Site L _{Amax} Contribution							34
28/04/2022 (Evening)	21:01	52	27	23	35	WD: N WS: 1.2m/s Rain: Nil	Insects <21
							Traffic 21-32
							Wind in trees 24-29
							Dog bark 21-52
DGM inaudible							
Dargues Site L _{Aeq} (15min) Contribution							<20
Dargues Site L _{Amax} Contribution							<20
28/04/2022 (Night)	22:20	47	27	23	35	WD: NNW WS: 1.1m/s Rain: Nil	Insects 21-28
							Wind in trees 26-47
							DGM inaudible
							Dargues Site L _{Aeq} (15min) Contribution
Dargues Site L _{Amax} Contribution							<20
Dargues Site L _{Amax} Contribution							<20

Note 1: Meteorology data obtained from DGM onsite weather station.

4.4 Assessment Results – Location R34

The results of the attended noise measurements at location R34 for the April 2022 survey are summarised in **Table 7** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 7 Operator-Attended Noise Survey Results – Location R34							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology ¹	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}			
28/04/2022 (Day)	11:50	84	59	35	35	WD: N	Birds 36-47
						WS: 1.4m/s	Insects <31
							Wind in trees 32-36
							Traffic 39-84
						Rain: Nil	DGM inaudible
Dargues Site L _{Aeq} (15min) Contribution							<25
Dargues Site L _{Amax} Contribution							<25
28/04/2022 (Evening)	19:58	79	51	24	35	WD: N	Insects 22-24
						WS: 1m/s	Traffic 24-79
							DGM inaudible
							Rain: Nil
						Dargues Site L _{Aeq} (15min) Contribution	
Dargues Site L _{Amax} Contribution							<20
28/04/2022 (Night)	23:23	49	27	21	35	WD: NNE	Insects 18-26
						WS: 1.2m/s	Wildlife 24-49
							DGM inaudible
							Rain: Nil
						Dargues Site L _{Aeq} (15min) Contribution	
Dargues Site L _{Amax} Contribution							<20

Note 1: Meteorology data obtained from DGM onsite weather station.

4.5 Assessment Results – Location R108

The results of the attended noise measurements at location R108 for the April 2022 survey are summarised in **Table 8** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 8 Operator-Attended Noise Survey Results – Location R108								
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology ¹	Description and SPL, dBA	
		L _{Amax}	L _{Aeq}	L _{A90}				
28/04/2022 (Day)	13:18	57	41	35	35	WD: NNW WS: 1.5m/s Rain: Nil	Insects <32	
							Birds 32-57	
							Wind in trees 34-38	
							DGM inaudible	
							Dargues Site L _{Aeq} (15min) Contribution	<25
Dargues Site L _{Amax} Contribution	<25							
28/04/2022 (Evening)	21:21	50	37	29	35	WD: N WS: 1.1m/s Rain: Nil	Insects 20-40	
							Wildlife 44-50	
							DGM inaudible	
							Dargues Site L _{Aeq} (15min) Contribution	<20
							Dargues Site L _{Amax} Contribution	<20
28/04/2022 (Night)	22:00	49	38	31	35	WD: NNW WS: 1.1m/s Rain: Nil	Insects 27-42	
							Wildlife 40-49	
							DGM inaudible	
							Dargues Site L _{Aeq} (15min) Contribution	<21
							Dargues Site L _{Amax} Contribution	<21

Note 1: Meteorology data obtained from DGM onsite weather station.

4.6 Unattended Road Traffic Noise Results – Location R34

To assess road traffic noise levels associated with mine related heavy vehicles, an unattended noise monitor was located on the boundary of 664 Majors Creek Road, Jembaicumbene (R34).

The results of the road traffic noise measurements on Thursday 28 April 2022 and Friday 29 April 2022 are summarised in **Table 9**.

As per Section 3(2) of Dargues Gold Mine’s Noise Management Plan, results of the road traffic noise measurements identify that noise levels were influenced by extraneous noise sources such as birds and local road traffic not associated with the mine. The noise contribution of mine related traffic at this location remained below the relevant criteria.

Road traffic noise calculations were undertaken to quantify project related road traffic noise contributions at the measurement position using United States Department of Transport, Federal Highway Administration (FHWA) Traffic Noise Model (TNM) Low Volume Calculation Tool to predict the LAeq noise level from project related trucks traveling past existing receivers on Majors Creek Road. This method is an internationally accepted theoretical road traffic noise prediction model. The noise levels were calculated to R34 at 6m from the road. Results of the road traffic noise calculations identify that mine related heavy vehicles satisfy the relevant road noise criteria, hence would comply at all privately-owned receivers further than 6m from Majors Creek Road.

Table 9 Road Noise Survey Results			
Operational Period	Overall Calculated dB LAeq (dBA re 20 µPa)	Overall Measured dB LAeq (dBA re 20 µPa)	Compliance Limit dB LAeq (period)
Assessment Period – Day (7am to 10pm), dB LAeq(15hr)			
7:00am to 10:00pm	47	60	60
Assessment Period – Night (10pm to 7am), dB LAeq(9hr)			
10:00pm to 7:00am	48	55	55

Note 1: Vehicle flows provided by DGM.

5 Discussion

5.1 Operator Attended Noise Discussion

5.1.1 Discussion of Results – Location R20

Operator attended measurement results at R20, on Thursday 28 April 2022 identified that DGM activities were inaudible during the assessment periods, therefore satisfying criteria. Generally, traffic, birds, insects, wind in trees, dog bark, aircraft and livestock were audible sources throughout all three monitoring periods.

Therefore, noise contribution from the mine satisfied the relevant noise criteria for the attended measurements on Thursday 28 April 2022.

5.1.2 Discussion of Results – Location R27

Operator attended measurement results at R27, on Thursday 28 April 2022 identified that DGM emissions were audible during the day and night periods, although remained below relevant criteria. Generally, traffic, insects, wind in trees and livestock were audible sources throughout all three monitoring periods.

In summary the noise contribution from the mine satisfied the relevant noise criteria for the attended measurements on Thursday 28 April 2022.

5.1.3 Discussion of Results – Location R29

Operator attended measurement results at R29, on Thursday 28 April 2022 identified that DGM mobile plant were audible during the day period, although remained below relevant criteria. Generally, birds, wind in trees, insects, dog bark and traffic were audible throughout all three monitoring periods.

In summary the noise contribution from the mine satisfied the relevant noise criteria for the attended measurements on Thursday 28 April 2022.

5.1.4 Discussion of Results – Location R34

Operator attended measurement results at R34, on Thursday 28 April 2022 identified that DGM activities remained inaudible during the assessment periods, and therefore satisfied criteria. Generally, birds, insects, wind in trees, traffic and wildlife were audible sources throughout all three monitoring periods.

In summary the noise contribution from the mine satisfied the relevant noise criteria for the attended measurements on Thursday 28 April 2022.

5.1.5 Discussion of Results – Location R108

Operator attended measurement results at R108, on Thursday 28 April 2022 identified that DGM activities remained inaudible during the assessment periods, and therefore satisfied criteria. Generally, insects, birds, wind in trees and wildlife were audible sources throughout all three monitoring periods.

In summary, the noise contribution from the mine satisfied the relevant noise criteria for the attended measurements Thursday 28 April 2022.

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of Aurelia Metals Ltd at Dargues Gold Mine, Majors Creek, NSW. The assessment was completed to quantify site noise emissions against relevant noise criteria pertaining to mine operations and offsite traffic noise emissions during Quarter 2, 2022.

Attended monitoring on Thursday 28 April 2022 has identified that operational noise emissions generated by the mine comply with relevant $L_{Aeq(15min)}$ and L_{Amax} noise limits at all assessed receivers.

Road traffic noise levels were influenced by extraneous noise sources such as insects, birds and local road traffic not associated with the mine. Notwithstanding, mine road traffic noise levels remained below relevant road noise criteria.

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Appendix A – Glossary of Terms

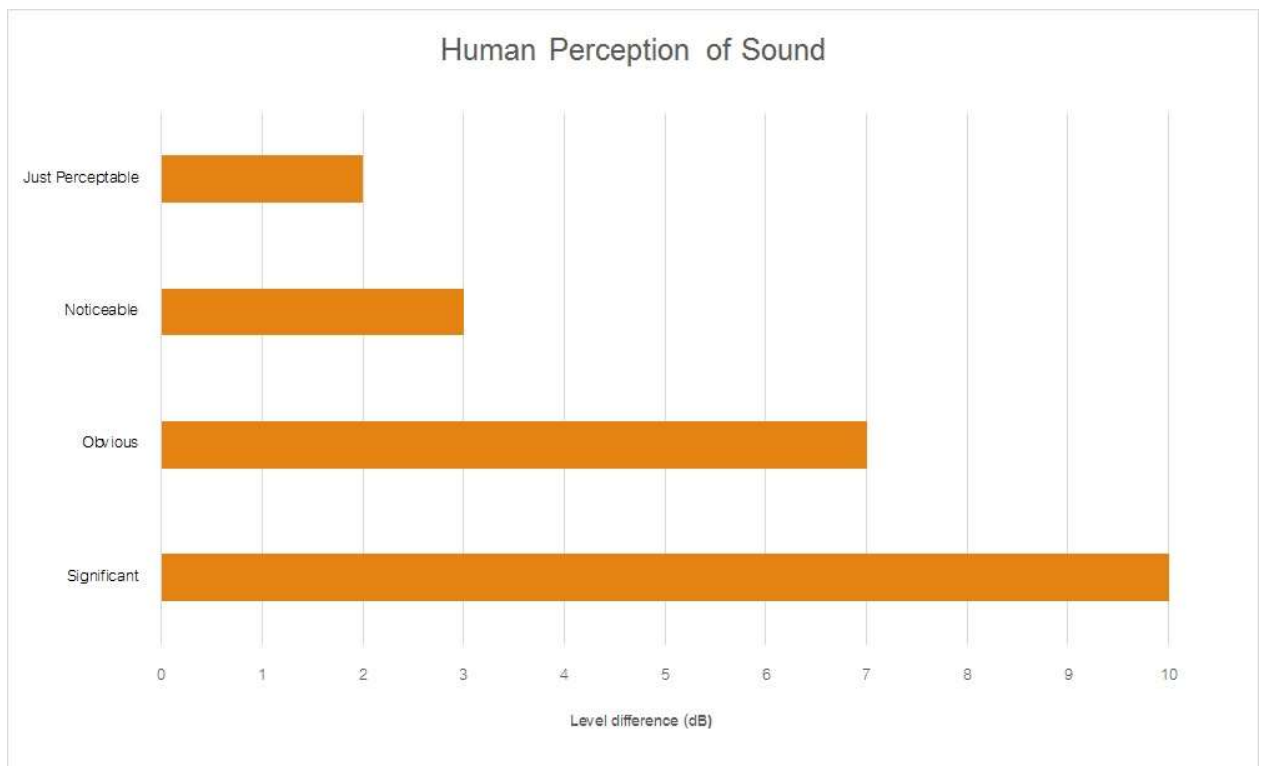
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	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.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAm _{ax}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : $= 10 \cdot \log_{10} (W/W_0)$ <p>Where : W is the sound power in watts and W₀ is the sound reference power at 10-12 watts.</p>

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



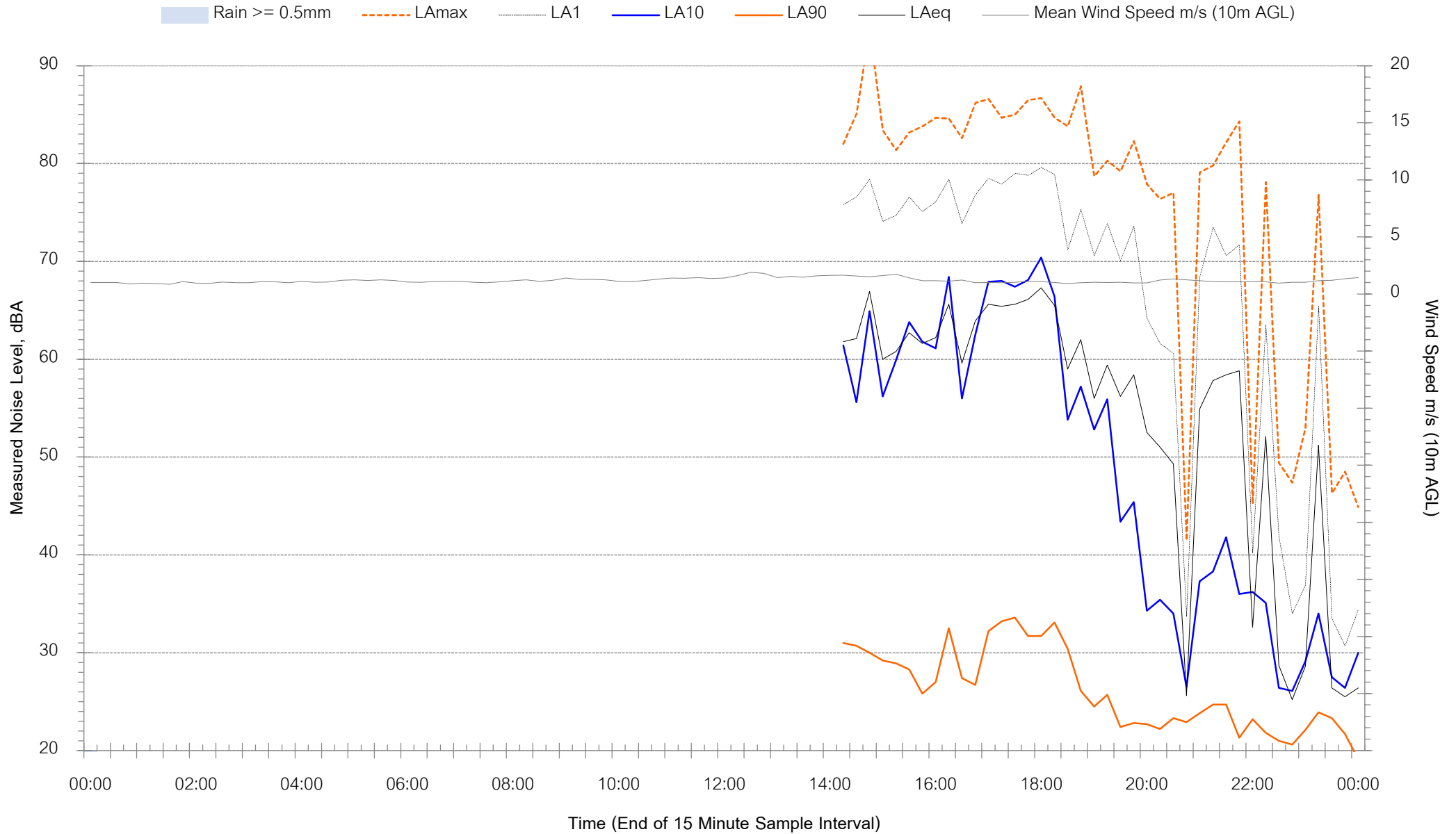
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Appendix B – Unattended Noise Monitoring Charts



Background Noise Levels

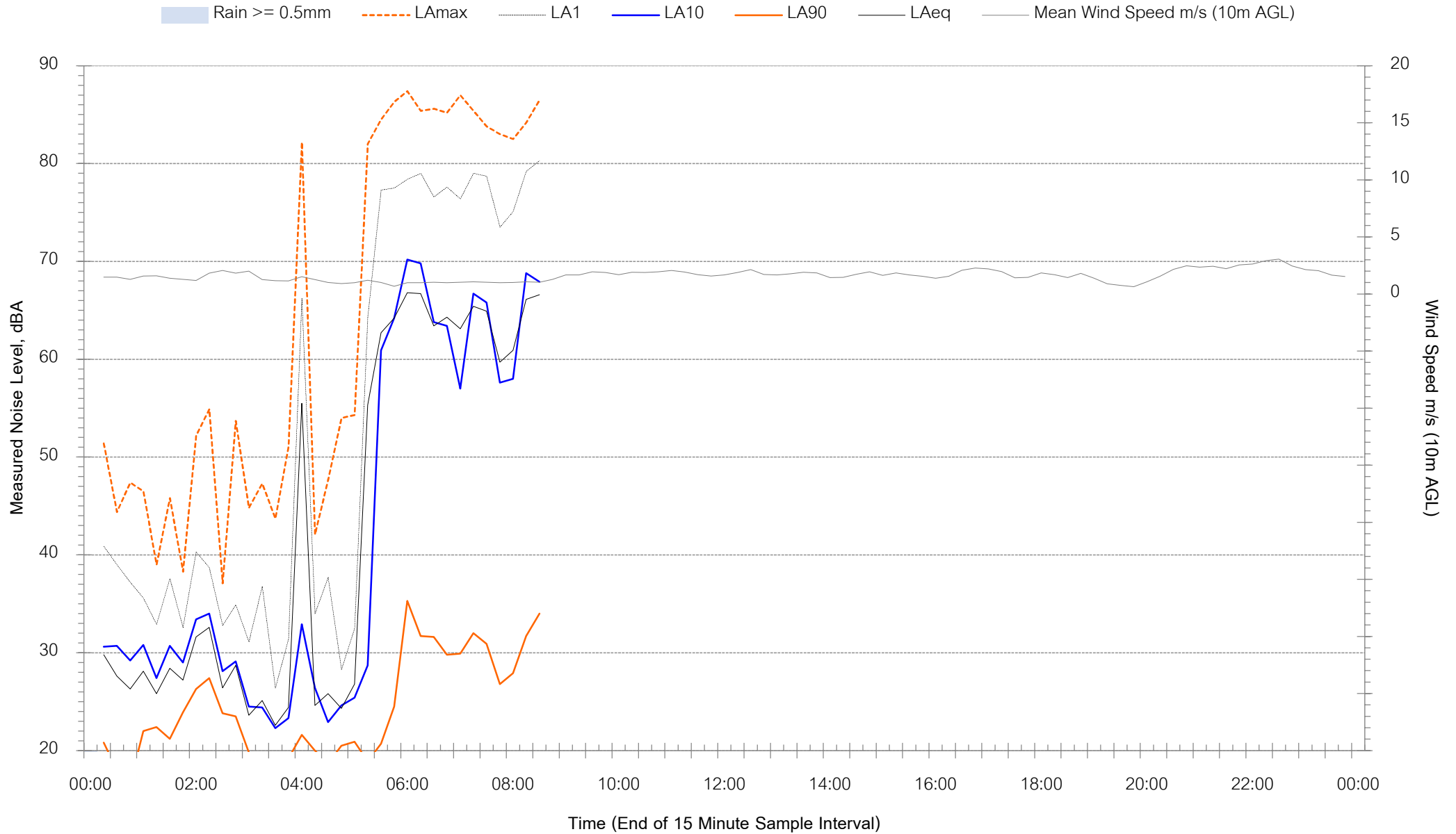
664 Majors Creek Road, Jembaicumbene (R34) - Thursday 28 April 2022





Background Noise Levels

664 Majors Creek Road, Jembaicumbene (R34) - Friday 29 April 2022



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Appendix C – Monthly Unattended Noise Monitoring Summary Reports



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17 May 2022

MAC201092-02-2022LR04

Attention: Enzo Guarino
Environmental and Social Advisor
Aurelia Metals Ltd
920 Majors Creek Road
Majors Creek NSW 2622

Dear Enzo,

Unattended Noise Monitoring Summary

Dargues Gold Mine, George Street, Majors Creek, NSW.

Month Ending 30 April 2022.

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has completed a review of data from an unattended noise monitor located at Dargues Gold Mine (DGM), George Street, Majors Creek, NSW on behalf of Aurelia Metals Ltd.

The review of unattended data from a SVANTEK SV200A Noise Monitoring Station (the 'monitor') was completed on behalf of DGM. The monitor was installed by MAC to assist in managing noise emissions from DGM and to supplement quarterly attended noise monitoring.

2 Analysis Methodology

The analysis reviewed evening and night noise levels (ie not daytime) and has incorporated directional analysis to include noise sources from the direction of the mine site. Results obtained during non-prevailing meteorological conditions (ie wind speeds above 3m/s at 10m above ground and temperature inversion conditions of up to 3°C /100m and wind speeds of up to 2m/s at 10m above ground level) are considered not applicable against the EPL (#20095) criteria and have been excluded.

3 Unattended Monitoring Results and Discussion

A review of results and discussion for the unattended monitoring period for the month ending 30 April 2022 has been completed. A total of 38 noise events have been identified and compared against the threshold of 33dBA as noted in Section 8.3.2 of the NMP. A review of these events identified that eight (8) events were attributed to DGM activities. DGM contribution remained below the estimated LAeq threshold, and therefore further analysis is not required. Table 1 provides a summary of these events.

The analysed noise events for the monitoring period were dominated by extraneous noise such as road traffic, insects, livestock, birds and wind.

Figure 1 presents the average monthly noise metrics for the monitoring terminal over several previous months. Figure 2 presents the compliance performance with respect to DGM noise contributions LA90 and relevant criteria for the historic data.

We trust this information is satisfactory for your requirements at this time, if you have any questions, please contact the undersigned.

Yours sincerely



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Table 1 - Summary of Results - Unattended Noise Monitoring Events, Month Ending 30 April 2022

Date/Time	L _{Amax} dBA	L _{Aeq} dBA	L _{A90} dBA	Threshold L _{Aeq} , dBA (dB)	EPL Criteria L _{Aeq} (15min) dBA	Estimated Mine Noise Contribution L _{Aeq} (15min)	Satisfies EPL Criteria	Stability Class	Wind Speed (m/s)	Source Direction	Comments
11/04/2022 00:30	42	33	29	33	35	27	Yes	D	1.0	N	Insects and DGM hum
11/04/2022 01:45	37	29	25	33	35	23	Yes	D	1.0	N	Insects
11/04/2022 02:15	37	31	26	33	35	24	Yes	D	1.2	NNW	Insects
11/04/2022 20:15	43	35	33	33	35	30	Yes	D	1.0	N	Insects
11/04/2022 23:15	47	32	29	33	35	26	Yes	D	0.9	NNE	Insects
12/04/2022 02:15	37	27	23	33	35	21	Yes	D	1.0	N	Insects
12/04/2022 02:30	43	26	23	33	35	20	Yes	D	0.9	NNW	Insects
12/04/2022 03:00	38	27	23	33	35	21	Yes	D	1.0	N	Insects and wildlife
12/04/2022 04:30	37	26	22	33	35	20	Yes	D	0.6	N	Insects
12/04/2022 05:15	37	28	23	33	35	21	Yes	D	0.6	N	Insects, traffic and wind
14/04/2022 00:45	34	24	21	33	35	18	Yes	C	0.3	NNE	Insects
14/04/2022 03:30	32	23	21	33	35	18	Yes	D	1.0	NNE	Insects
14/04/2022 05:00	30	22	21	33	35	18	Yes	D	1.1	NNE	Insects and traffic
15/04/2022 22:30	45	27	23	33	35	21	Yes	D	0.9	N	Insects and wildlife
15/04/2022 22:45	48	29	22	33	35	22	Yes	D	1.0	N	Insects, traffic and wildlife
16/04/2022 01:45	44	25	21	33	35	19	Yes	D	0.8	NNE	Insects
17/04/2022 00:15	37	28	26	33	35	23	Yes	D	1.0	NNE	DGM hum
17/04/2022 00:30	36	28	26	33	35	23	Yes	D	0.9	N	DGM hum
17/04/2022 02:15	34	26	23	33	35	20	Yes	D	0.9	N	DGM hum
17/04/2022 05:00	33	25	23	33	35	20	Yes	C	0.6	NNE	Insects and DGM hum
18/04/2022 00:30	47	31	26	33	35	24	Yes	D	0.0	NNE	Insects and wind
18/04/2022 01:30	43	26	23	33	35	20	Yes	D	0.6	NNW	DGM hum

Table 1 - Summary of Results - Unattended Noise Monitoring Events, Month Ending 30 April 2022

Date/Time	L _{Amax} dBA	L _{Aeq} dBA	L _{A90} dBA	Threshold L _{Aeq} , dBA (dB)	EPL Criteria L _{Aeq} (15min) dBA	Estimated Mine Noise Contribution L _{Aeq} (15min)	Satisfies EPL Criteria	Stability Class	Wind Speed (m/s)	Source Direction	Comments
18/04/2022 23:30	43	28	23	33	35	22	Yes	D	1.2	NNE	Insects and DGM hum
19/04/2022 01:15	40	24	22	33	35	19	Yes	D	1.1	NNW	Insects, wildlife and DGM hum
19/04/2022 01:30	43	26	24	33	35	21	Yes	D	1.2	N	Insects and traffic
19/04/2022 02:30	48	27	22	33	35	20	Yes	D	1.1	NNE	Insects and birds
20/04/2022 00:00	38	33	31	33	35	28	Yes	D	0.3	NNW	Birds
20/04/2022 00:15	39	34	31	33	35	28	Yes	D	0.5	NNW	Wind
22/04/2022 01:15	39	22	20	33	35	17	Yes	C	1.4	NNW	Insects and wildlife
22/04/2022 02:30	31	21	19	33	35	16	Yes	C	1.3	N	Insects
24/04/2022 02:30	40	25	22	33	35	19	Yes	D	1.1	NNW	Insects and traffic
24/04/2022 02:45	42	27	24	33	35	22	Yes	D	1.0	N	Insects and traffic
24/04/2022 23:30	43	23	20	33	35	18	Yes	D	0.7	NNW	Wildlife
25/04/2022 00:00	48	23	21	33	35	18	Yes	D	0.5	NNE	Wildlife
25/04/2022 03:45	47	23	20	33	35	18	Yes	D	1.3	N	Insects
25/04/2022 04:30	36	22	21	33	35	18	Yes	D	0.8	NNW	Traffic
26/04/2022 04:15	47	23	19	33	35	17	Yes	D	0.5	NNE	Insects
28/04/2022 21:45	48	29	24	33	35	22	Yes	D	0.215	NNE	Insects and wind

Note: It is reiterated that inapplicable meteorological conditions such as rain, winds >3m/s, and temperature inversions of up to 3°C / 100m and wind speeds of up to 2m/s at 10m above ground level and have been excluded.

Figure 1 - Average Monthly Noise Metrics - Dargues Gold Mine

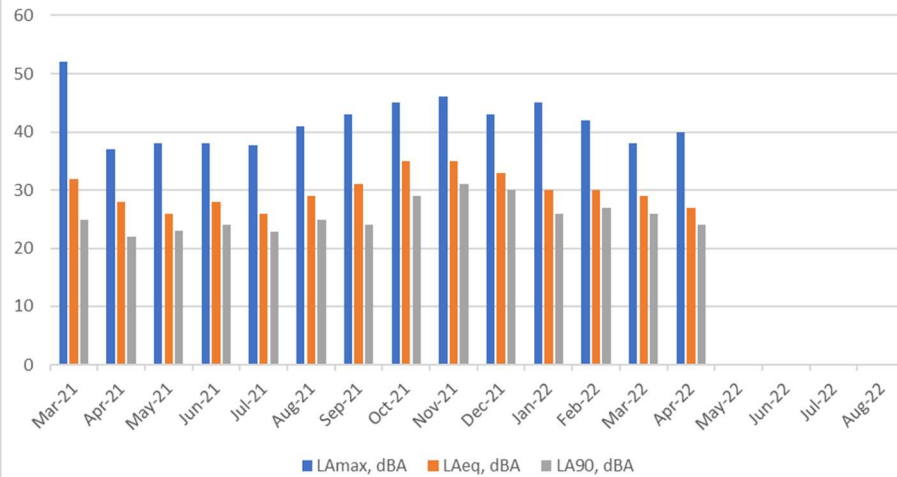
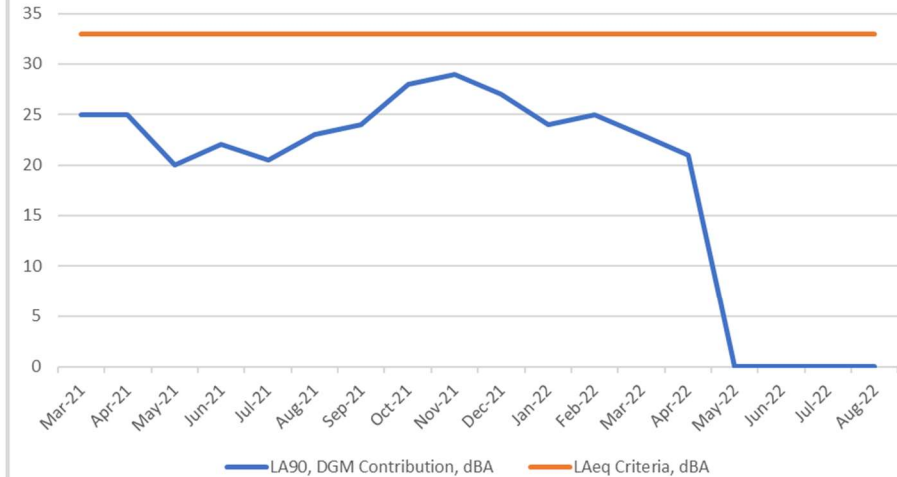


Figure 2 - Historic Noise Compliance Average - Dargues Gold Mine





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9 June 2022

MAC201092-02-2022LR05

Attention: Dargues Gold Mine (DGM) Sustainability Team
Aurelia Metals Ltd
920 Majors Creek Road
Majors Creek NSW 2622

Dear DGM Sustainability Team,

Unattended Noise Monitoring Summary

Dargues Gold Mine, George Street, Majors Creek, NSW.

Month Ending 31 May 2022.

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has completed a review of data from an unattended noise monitor located at Dargues Gold Mine (DGM), George Street, Majors Creek, NSW on behalf of Aurelia Metals Ltd.

The review of unattended data from a SVANTEK SV200A Noise Monitoring Station (the 'monitor') was completed on behalf of DGM. The monitor was installed by MAC to assist in managing noise emissions from DGM and to supplement quarterly attended noise monitoring.

2 Analysis Methodology

The analysis reviewed evening and night noise levels (ie not daytime) and has incorporated directional analysis to include noise sources from the direction of the mine site. Results obtained during non-prevailing meteorological conditions (ie wind speeds above 3m/s at 10m above ground and temperature inversion conditions of up to 3°C /100m and wind speeds of up to 2m/s at 10m above ground level) are considered not applicable against the EPL (#20095) criteria and have been excluded.

3 Unattended Monitoring Results and Discussion

A review of results and discussion for the unattended monitoring period for the month ending 31 May 2022 has been completed. A total of 88 noise events have been identified and compared against the threshold of 33dBA as noted in Section 8.3.2 of the NMP. A review of these events identified that one (1) event was attributed to DGM activities. DGM contribution remained below the estimated LAeq threshold, and therefore further analysis is not required. Table 1 provides a summary of these events.

The analysed noise events for the monitoring period were dominated by extraneous noise such as road traffic, insects, livestock, birds and wind.

Figure 1 presents the average monthly noise metrics for the monitoring terminal over several previous months. Figure 2 presents the compliance performance with respect to DGM noise contributions LA90 and relevant criteria for the historic data.

We trust this information is satisfactory for your requirements at this time, if you have any questions, please contact the undersigned.

Yours sincerely



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Table 1 - Summary of Results - Unattended Noise Monitoring Events, Month Ending 31 May 2022

Date/Time	L _{Amax} dBA	L _{Aeq} dBA	L _{A90} dBA	Threshold L _{Aeq} , dBA (dB)	EPL Criteria L _{Aeq} (15min) dBA	Estimated Mine Noise Contribution L _{Aeq} (15min)	Satisfies EPL Criteria	Stability Class	Wind Speed (m/s)	Source Direction	Comments
08/05/2022 19:15	43	20	17	33	35	14	Yes	D	2.7	N	Insects and traffic
08/05/2022 21:45	34	22	18	33	35	16	Yes	D	1.8	NNE	Birds
08/05/2022 22:30	40	23	20	33	35	18	Yes	E	2.5	NNE	Insects and traffic
08/05/2022 22:45	46	25	20	33	35	19	Yes	D	2.5	NNE	Insects and birds
10/05/2022 20:00	43	24	19	33	35	18	Yes	B	1.4	NNE	Insects and traffic
10/05/2022 21:00	44	25	20	33	35	18	Yes	D	1.5	NNE	Insects
10/05/2022 21:15	42	24	20	33	35	18	Yes	D	1.4	NNE	Insects
10/05/2022 21:30	42	24	20	33	35	18	Yes	D	1.3	NNE	Insects
10/05/2022 21:45	41	24	21	33	35	19	Yes	D	1.2	NNE	Insects
10/05/2022 22:30	42	26	22	33	35	20	Yes	C	1.3	NNE	Insects and birds
11/05/2022 00:30	50	28	26	33	35	23	Yes	C	1.1	N	Traffic
11/05/2022 03:30	36	22	20	33	35	17	Yes	D	0.8	NNE	Insects and birds
11/05/2022 04:30	41	24	21	33	35	18	Yes	D	1.2	NNE	Insects and birds
11/05/2022 05:15	38	22	20	33	35	17	Yes	D	1.0	NNE	Traffic
12/05/2022 20:45	42	35	34	33	35	30	Yes	D	2.8	NNE	Insects and wind
12/05/2022 21:15	42	35	33	33	35	30	Yes	D	2.9	NNE	Insects and wind
12/05/2022 21:45	39	34	33	33	35	29	Yes	D	2.8	NNE	Insects and wind
12/05/2022 23:15	40	34	32	33	35	29	Yes	D	2.5	NNE	Insects and wind
12/05/2022 23:45	42	34	32	33	35	29	Yes	B	1.8	NNE	Insects and wind
13/05/2022 00:00	47	33	31	33	35	28	Yes	D	1.7	NNE	Insects and wind
13/05/2022 00:30	47	34	32	33	35	29	Yes	D	2.0	NNE	Insects and wind
13/05/2022 01:15	44	34	32	33	35	29	Yes	D	2.4	NNE	Insects and wind
13/05/2022 01:30	45	34	31	33	35	29	Yes	D	2.1	NNE	Insects and wind
13/05/2022 02:45	46	33	30	33	35	28	Yes	D	1.8	N	Insects and wind

Table 1 - Summary of Results - Unattended Noise Monitoring Events, Month Ending 31 May 2022

Date/Time	L _{Amax} dBA	L _{Aeq} dBA	L _{A90} dBA	Threshold L _{Aeq} , dBA (dB)	EPL Criteria L _{Aeq} (15min) dBA	Estimated Mine Noise Contribution L _{Aeq} (15min)	Satisfies EPL Criteria	Stability Class	Wind Speed (m/s)	Source Direction	Comments
13/05/2022 03:00	48	33	31	33	35	28	Yes	D	1.5	N	Insects and wind
13/05/2022 03:15	48	32	30	33	35	27	Yes	D	1.6	N	Insects and wind
13/05/2022 04:00	48	32	30	33	35	27	Yes	D	1.9	N	Insects, birds and wind
13/05/2022 04:15	45	31	29	33	35	26	Yes	D	2.0	N	Insects and wind
13/05/2022 04:30	40	31	30	33	35	26	Yes	D	1.9	N	Insects and wind
13/05/2022 04:45	40	31	29	33	35	26	Yes	D	2.0	N	Insects and wind
13/05/2022 05:15	39	30	28	33	35	25	Yes	D	2.0	N	Insects, traffic and wind
13/05/2022 21:30	46	29	24	33	35	23	Yes	B	1.1	N	Insects and traffic
13/05/2022 22:15	44	27	23	33	35	21	Yes	C	1.1	NNE	Insects
13/05/2022 23:00	42	29	26	33	35	24	Yes	D	0.7	N	Insects and livestock
13/05/2022 23:15	49	30	25	33	35	23	Yes	A	0.5	N	Insects and traffic
14/05/2022 00:00	44	30	25	33	35	23	Yes	C	0.9	N	Insects and traffic
14/05/2022 01:15	35	27	25	33	35	22	Yes	D	0.9	N	Insects and traffic
14/05/2022 01:30	35	27	25	33	35	22	Yes	C	0.8	N	Insects and birds
14/05/2022 02:00	44	28	25	33	35	22	Yes	C	0.9	NNE	Insects
14/05/2022 03:00	45	26	23	33	35	21	Yes	D	0.7	N	Insects
14/05/2022 03:45	39	25	23	33	35	20	Yes	D	0.9	NNE	Insects and birds
14/05/2022 04:00	47	26	23	33	35	20	Yes	D	0.9	NNE	Insects and livestock
14/05/2022 04:15	44	28	23	33	35	22	Yes	D	0.8	N	Insects
14/05/2022 04:45	41	26	24	33	35	21	Yes	D	0.5	N	Insects
14/05/2022 05:00	41	27	24	33	35	21	Yes	D	0.4	N	Insects
14/05/2022 05:15	42	26	23	33	35	20	Yes	D	0.2	NNE	Insects
14/05/2022 05:30	40	28	24	33	35	22	Yes	D	0.3	N	Insects and DGM fan
14/05/2022 20:55	50	33	25	33	35	25	Yes	D	1.2	N	Insects, traffic and dog bark

Table 1 - Summary of Results - Unattended Noise Monitoring Events, Month Ending 31 May 2022

Date/Time	L _{Amax} dBA	L _{Aeq} dBA	L _{A90} dBA	Threshold L _{Aeq} , dBA (dB)	EPL Criteria L _{Aeq} (15min) dBA	Estimated Mine Noise Contribution L _{Aeq} (15min)	Satisfies EPL Criteria	Stability Class	Wind Speed (m/s)	Source Direction	Comments
14/05/2022 21:40	43	29	26	33	35	23	Yes	D	1.2	NNW	Insects and birds
14/05/2022 22:10	48	29	25	33	35	23	Yes	D	1.2	NNW	Insects and birds
14/05/2022 22:40	35	27	24	33	35	22	Yes	D	1.3	N	Insects and livestock
14/05/2022 23:10	37	27	24	33	35	22	Yes	D	1.2	N	Insects and birds
15/05/2022 01:25	44	29	26	33	35	23	Yes	D	1.2	N	Insects and traffic
15/05/2022 03:55	45	29	25	33	35	23	Yes	D	1.5	NNW	Insects
16/05/2022 01:15	44	32	30	33	35	27	Yes	C	0.9	N	Insects and wind
16/05/2022 04:15	39	30	26	33	35	24	Yes	D	0.9	NNW	Insects
16/05/2022 04:30	44	29	26	33	35	24	Yes	D	0.9	NNW	Insects and wind
16/05/2022 04:45	48	32	27	33	35	25	Yes	D	0.9	N	Insects and wind
16/05/2022 20:15	41	27	23	33	35	21	Yes	D	0.9	NNW	Insects and traffic
16/05/2022 21:30	34	27	24	33	35	21	Yes	D	0.9	N	Insects and wildlife
16/05/2022 23:00	33	25	23	33	35	20	Yes	E	0.9	NNW	Insects and birds
16/05/2022 23:45	41	27	24	33	35	22	Yes	D	0.9	NNW	Insects and livestock
17/05/2022 00:00	39	27	24	33	35	22	Yes	C	0.9	NNW	Insects and livestock
17/05/2022 00:30	42	26	24	33	35	21	Yes	B	0.9	NNW	Insects
17/05/2022 00:45	47	27	23	33	35	21	Yes	D	1.0	NNW	Insects and livestock
17/05/2022 01:45	37	27	24	33	35	22	Yes	C	0.9	NNW	Insects and traffic
17/05/2022 02:45	36	26	24	33	35	21	Yes	C	0.9	NNW	Insects and birds
17/05/2022 04:45	40	25	23	33	35	20	Yes	D	1.0	N	Insects and traffic
17/05/2022 05:00	36	27	24	33	35	21	Yes	D	1.0	NNW	Birds
17/05/2022 05:30	34	26	24	33	35	21	Yes	E	1.0	NNW	Insects and traffic
17/05/2022 21:00	49	33	27	33	35	26	Yes	C	1.0	N	Traffic
17/05/2022 22:00	41	27	23	33	35	21	Yes	D	1.0	N	Traffic

Table 1 - Summary of Results - Unattended Noise Monitoring Events, Month Ending 31 May 2022

Date/Time	L _{Amax} dBA	L _{Aeq} dBA	L _{A90} dBA	Threshold L _{Aeq} , dBA (dB)	EPL Criteria L _{Aeq} (15min) dBA	Estimated Mine Noise Contribution L _{Aeq} (15min)	Satisfies EPL Criteria	Stability Class	Wind Speed (m/s)	Source Direction	Comments
17/05/2022 23:00	43	28	24	33	35	22	Yes	C	0.9	N	Traffic and livestock
18/05/2022 04:45	47	30	27	33	35	24	Yes	C	1.0	NNW	Wind
18/05/2022 20:15	34	22	20	33	35	17	Yes	D	1.1	N	Traffic
18/05/2022 21:00	44	24	21	33	35	18	Yes	C	1.1	N	Birds
18/05/2022 21:30	45	29	23	33	35	22	Yes	D	1.0	N	Traffic
18/05/2022 22:15	34	24	22	33	35	19	Yes	D	1.0	N	Wind
18/05/2022 23:00	42	26	23	33	35	20	Yes	D	1.0	NNW	Insects and birds
18/05/2022 23:30	46	26	22	33	35	20	Yes	D	1.1	N	Insects and birds
19/05/2022 00:30	33	24	22	33	35	19	Yes	D	1.1	NNE	Livestock
19/05/2022 00:45	40	25	22	33	35	19	Yes	A	0.6	NNE	Birds
19/05/2022 02:00	34	25	23	33	35	20	Yes	A	1.2	N	Traffic
19/05/2022 02:30	37	24	22	33	35	19	Yes	D	1.4	N	Birds
24/05/2022 20:15	34	20	19	33	35	15	Yes	D	1.2	NNE	Traffic
25/05/2022 20:00	31	22	20	33	35	17	Yes	D	0.5	NNE	Local residential noise
26/05/2022 04:15	47	28	23	33	35	22	Yes	C	1.2	NNE	Wildlife
27/05/2022 20:15	47	23	19	33	35	17	Yes	D	1.4	NNE	Traffic

Note: It is reiterated that inapplicable meteorological conditions such as rain, winds >3m/s, and temperature inversions of up to 3°C / 100m and wind speeds of up to 2m/s at 10m above ground level and have been excluded.

Figure 1 - Average Monthly Noise Metrics - Dargues Gold Mine

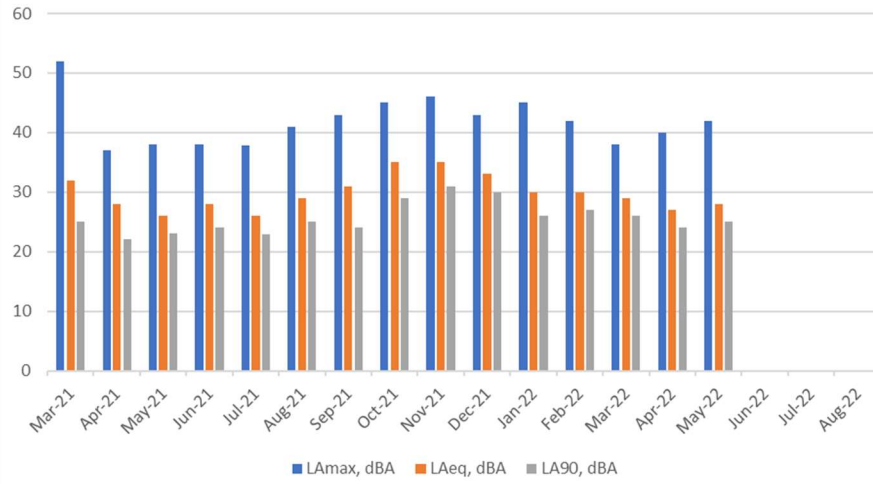
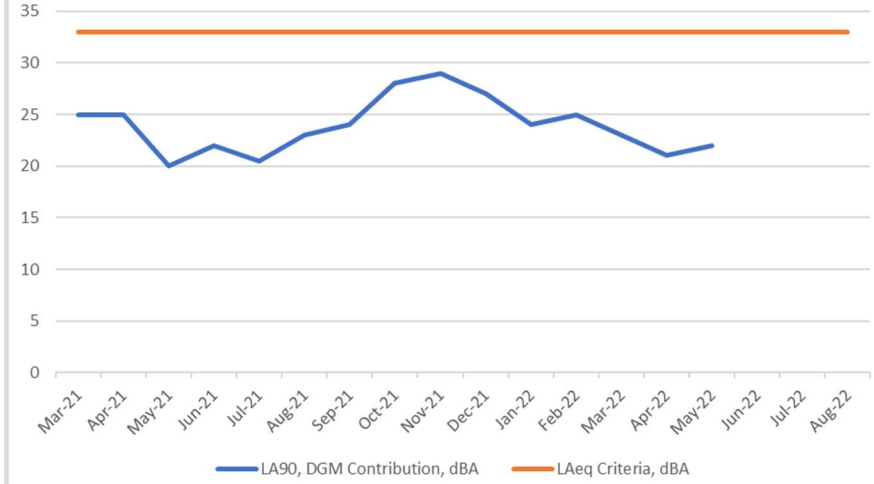


Figure 2 - Historic Noise Compliance Average - Dargues Gold Mine



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