Monthly Noise Monitoring Assessment

Tomingley Gold Mine, September 2023

Prepared for: Tomingley Gold Operations Pty Limited
September 2023
MAC160270-2023RP09

Muller Acoustic Consulting

Document Information

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Prepared for: Tomingley Gold Operations Pty Limited

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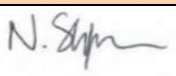
MAC160270-2023RP09	29 September 2023	Nicholas Shipman		Oliver Muller	

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Tomingley Gold Operations Pty Ltd (TGO) to complete a Noise Monitoring Assessment (NMA) for Tomingley Gold Mine (the mine), Tomingley, NSW.

The NMA involved quantifying the noise contribution of the mine by direct attended measurements to determine mining noise emissions so that effective management and controls can be implemented where required. The monitoring has been conducted in accordance with the TGO Noise Management Plan and in general accordance with Conditions L4.2 to L4.7 of the EPL at six representative receiver locations. It is noted that this assessment has been completed as part of an internal noise management initiative and does not form part of the annual noise monitoring program to address conditions of the Environmental Protection License (EPL).

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's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Environment Protection Licence EPL 20169 (EPL);
- Standards Australia AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters – Specifications; and
- Standards Australia 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**.

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2 Environmental Protection License Noise Limits

Historic assessments for the mine categorise receivers into Noise Assessment Groups (NAGs). The NAGs were derived based on ambient noise data that controlled receiver RBLs.

Table 1 reproduces the operational and sleep disturbance noise limits for assessed receivers referenced from the EPL that have been adopted for this NMA and are consistent with historic EPL monitoring locations.

Table 1 Noise Limits, dBA

Noise Assessment Group	Receivers	Day	Evening	Night	
		$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{A1(1min)}$
NAG A	R4, R5, R6	35	35	35	45
NAG B	R2	36	35	35	45
NAG C	R3/R29	45	35	35	45
NAG D	R23	43	38	36	45

Note: Refer to figure in Appendix 4 of Project Approval 09-0155 for noise locations. However, these criteria do not apply if the Proponent has an agreement with the relevant owner(s) of these residences / land to generate higher noise levels, and the Proponent has advised the Department of Planning and Infrastructure and EPA in writing of the terms of this agreement.

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3 Methodology

3.1 Locality

TGO is located to the south of the village of Tomingley, NSW. Receivers in the locality surrounding the mine are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from historic Noise Assessments. The monitoring locations with respect to the mine are presented in the locality plan shown in **Figure 1**.

3.2 Assessment Methodology

The attended noise survey was conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. Measurements were carried out using a Svantek Type 1, 971 noise analyser between Monday 18 September 2023 and Wednesday 20 September 2023. The acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS 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 ±0.5dBA.

Both evening and night measurements were of 15-minutes in duration. Where possible, throughout each survey the operator quantified the contribution of each significant noise source. Extraneous noise sources were excluded from the analysis to calculate the $LA_{eq(15min)}$ mine noise contribution for comparison against the relevant EPL limit.

Prevailing meteorological conditions for the monitoring period were sourced from TGO's meteorological station and analysed in accordance with Appendix D1 of the NPI to determine the stability category present at the time of each measured sample. This was undertaken to determine applicability of results in accordance with Condition L4.3 of the EPL. Results obtained during non-prevailing meteorological conditions (ie F Class Stability in conjunction with a 2m/s drainage or G Class Stability) are considered not applicable against the EPL criteria.

FIGURE 1

LOCALITY PLAN

MAC160270

Tomingley Gold Operations

KEY

- Receivers
- Brooklands
- TGO Boundary

0 300 600 900 1200 1500 m

N

MAC
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4 Results

The monitoring and assessment results are presented in individual tables for each assessment location.

4.1 Meteorological Conditions

Weather data for the noise assessment was sourced from TGOs on-site meteorological station as well as operator measured conditions on site of EPL nominated receiver locations. The data was used to determine prevailing meteorological conditions at the time of the attended measurements, which are presented in Table 2.

Table 2 Prevailing Meteorological Conditions

Date & Time	TGO on-site Meteorological Station		Operator Measured Weather Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
18/09/2023 19:37	ENE	3.3	NW	0.5
18/09/2023 20:00	ENE	3.0	NW	0.8
18/09/2023 20:26	ENE	3.1	NE	0.8
18/09/2023 20:49	ENE	3.1	NE	0.5
18/09/2023 21:07	NE	3.0	NE	0.6
18/09/2023 21:29	NE	2.5	NE	0.5
18/09/2023 22:00	NE	2.7	NE	0.5
18/09/2023 22:22	NE	2.5	NE	0.5
18/09/2023 22:42	NE	2.2	NE	0.3
18/09/2023 23:04	NE	2.4	NE	0.8
18/09/2023 23:28	NE	2.4	NE	0.6
18/09/2023 23:50	NNE	3.4	NE	0.6
19/09/2023 19:37	NE	4.4	N	3.0
19/09/2023 19:59	NNE	4.0	N	3.0
19/09/2023 20:23	NE	4.3	N	3.5
19/09/2023 20:46	NNE	3.2	N	2.5
19/09/2023 21:05	NNE	4.6	N	3.5
19/09/2023 21:30	N	3.8	N	4.0
19/09/2023 22:00	NNE	6.5	N	3.5
19/09/2023 22:22	N	7.5	N	4.5
19/09/2023 22:40	NNE	4.3	N	4.5
19/09/2023 23:02	NNE	5.8	N	4.0
19/09/2023 23:27	N	5.5	N	5.0
19/09/2023 23:50	NNE	5.3	N	3.5
20/09/2023 19:32	SSW	0.9	SW	0.5
20/09/2023 19:53	S	1.8	SW	0.5
20/09/2023 20:18	SSW	1.7	SW	0.5
20/09/2023 20:40	S	2.3	SW	0.5
20/09/2023 20:59	S	1.8	SW	0.5
20/09/2023 21:26	S	2.8	SW	0.5
20/09/2023 22:00	S	2.5	SW	0.3
20/09/2023 22:21	SSE	1.8	SW	0.3
20/09/2023 22:39	SSE	2.4	SW	0.3
20/09/2023 23:01	S	3.0	SW	0.3
20/09/2023 23:26	SSW	2.1	SW	1.5
20/09/2023 23:47	SSW	2.1	SW	0.5

4.2 Assessment Results - Location R2

The results of the attended noise measurements at location R2 for the September 2023 survey are summarised in **Table 3** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 3 Operator-Attended Noise Survey Results – Location R2

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL	Meteorology[1]	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}	Limit		
18/09/2023	21:29 (Evening)	57	31	26	35	WD: NE WS: 0.5m/s Stab Class: E	Traffic 26-39 Insects 23-57 Livestock <26 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<20
18/09/2023	22:00 (Night)	62	42	29	35	WD: NE WS: 0.5m/s Stab Class: E	Traffic 27-62 Insects 25-35 Dogs barking 30-35 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<20
19/09/2023	21:30 (Evening)	52	40	37	35	WD: N WS: 4.0m/s Stab Class: D	Insects 35-41 Wind in trees 35-37 Traffic 34-52 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<27
19/09/2023	22:00 (Night)	48	40	38	35	WD: N WS: 3.5m/s Stab Class: E	Insects 36-40 Livestock 40-48 Wind in trees 35-39 Traffic 34-45 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							28
20/09/2023	21:26 (Evening)	64	43	25	35	WD: SW WS: 0.5m/s Stab Class: E	Traffic 28-64 Insects 22-27 Livestock 23-48 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<20
20/09/2023	22:00 (Night)	64	39	23	35	WD: SW WS: 0.3m/s Stab Class: D	Traffic 19-64 Livestock 22-40 Insects <24 TGO processing 25-33
TGO Site $L_{Aeq(15min)}$ Contribution							29

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

4.3 Assessment Results - Location R3/R29

The results of the attended noise measurements at location R3/R29 for the September 2023 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 R3/R29

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology[1]	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}			
18/09/2023	20:49 (Evening)	84	65	39	35	WD: NE WS: 0.5m/s Stab Class: E	Traffic 33-84 Insects 33-36 Dogs barking <33 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<29
18/09/2023	22:42 (Night)	91	67	39	35	WD: NE WS: 0.3m/s Stab Class: E	Traffic 43-91 Insects 32-35 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<29
19/09/2023	20:46 (Evening)	89	67	47	35	WD: N WS: 2.5m/s Stab Class: D	Traffic 48-89 Insects <45 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<35
19/09/2023	22:40 (Night)	86	64	42	35	WD: N WS: 4.5m/s Stab Class: D	Traffic 43-86 Wind in trees 42-45 Insects <40 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<32
20/09/2023	20:40 (Evening)	87	68	44	35	WD: SW WS: 0.5m/s Stab Class: E	Traffic 45-87 Insects <40 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<34
20/09/2023	22:39 (Night)	92	67	41	35	WD: SW WS: 0.3m/s Stab Class: D	Traffic 40-92 Insects 34-40 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<31

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

4.4 Assessment Results - Location R4

The results of the attended noise measurements at location R4 for the September 2023 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 R4

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology[1]	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}			
18/09/2023	20:00 (Evening)	61	37	34	35	WD: NE WS: 0.5m/s Stab Class: E	Traffic 36-41 Insects 33-43 Operator 44-61 TGO inaudible
				$L_{Aeq(15min)}$ Contribution			<24
18/09/2023	23:28 (Night)	56	37	32	35	WD: NE WS: 0.6m/s Stab Class: E	Traffic 30-42 Livestock 33-56 Insects 28-32 TGO processing 30-34
				$L_{Aeq(15min)}$ Contribution			32
19/09/2023	19:59 (Evening)	59	37	34	35	WD: N WS: 3.0m/s Stab Class: D	Traffic 32-42 Insects 33-40 Operator 56-59 TGO processing 30-32
				$L_{Aeq(15min)}$ Contribution			31
19/09/2023	23:27 (Night)	78	48	43	35	WD: N WS: 5.0m/s Stab Class: D	Wind in trees 40-53 Insects 40-51 Operator 74-78 TGO inaudible
				$L_{Aeq(15min)}$ Contribution			<33
20/09/2023	19:53 (Evening)	52	29	22	35	WD: SW WS: 0.5m/s Stab Class: E	Traffic 27-35 Insects 23-32 Livestock 24-52 TGO inaudible
				$L_{Aeq(1min)}$ Contribution			<20
20/09/2023	23:26 (Night)	59	32	27	35	WD: SW WS: 1.5m/s Stab Class: D	Traffic 30-59 Insects 25-31 Offsite drilling 28-34 Wind in trees <23 TGO inaudible
				$L_{Aeq(15min)}$ Contribution			<20

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

4.5 Assessment Results - Location R5

The results of the attended noise measurements at location R5 for the September 2023 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 R5

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology[1]	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}			
18/09/2023	19:37 (Evening)	80	62	46	35	WD: NW WS: 0.5m/s Stab Class: E	Traffic 45-80 Offsite drilling 46-53 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<35
18/09/2023	23:50 (Night)	78	61	44	35	WD: NE WS: 0.6m/s Stab Class: E	Traffic 42-78 Offsite drilling 44-58 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<34
19/09/2023	19:37 (Evening)	78	63	48	35	WD: N WS: 3.0m/s Stab Class: E	Offsite drilling 48-53 Insects <45 Traffic 46-78 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<35
19/09/2023	23:50 (Night)	79	57	39	35	WD: N WS: 3.5m/s Stab Class: D	Traffic 42-79 Offsite drilling 40-48 Wind in trees 35-42 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<29
20/09/2023	19:32 (Evening)	81	64	49	35	WD: SW WS: 0.5m/s Stab Class: D	Traffic 47-81 Insects <45 Offsite drilling 48-51 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<35
20/09/2023	23:47 (Night)	78	57	38	35	WD: SW WS: 0.5m/s Stab Class: E	Traffic 30-78 Offsite drilling 37-50 Dogs barking <35 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<28

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

4.6 Assessment Results - Location R6

The results of the attended noise measurements at location R6 for the September 2023 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 R6

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology[1]	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}			
18/09/2023	20:26 (Evening)	50	34	32	35	WD: NE WS: 0.8m/s Stab Class: E	Traffic 31-50 Insects 31-33 TGO processing 29-34
TGO Site $L_{Aeq(15min)}$ Contribution							32
18/09/2023	23:04 (Night)	58	37	34	35	WD: NE WS: 0.8m/s Stab Class: E	Traffic 29-58 Insects 30-37 Livestock 33-40 TGO processing 23-37
TGO Site $L_{Aeq(15min)}$ Contribution							35
19/09/2023	20:23 (Evening)	55	43	42	35	WD: N WS: 3.5m/s Stab Class: D	Insects 37-40 Traffic 40-55 Wind in trees 40-44 Dogs barking 41-43 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<32
19/09/2023	23:02 (Night)	56	49	47	35	WD: N WS: 4.0m/s Stab Class: D	Wind in Trees 44-49 Traffic 40-56 Insects 43-47 TGO processing <35
TGO Site $L_{Aeq(15min)}$ Contribution							<35
20/09/2023	20:18 (Evening)	55	29	20	35	WD: SW WS: 0.5m/s Stab Class: E	Traffic 30-55 Livestock 27-40 TGO inaudible
TGO Site $L_{Aeq(15min)}$ Contribution							<20
20/09/2023	23:01 (Night)	52	28	20	35	WD: SW WS: 0.3m/s Stab Class: E	Dogs barking 30-44 Livestock 28-41 Traffic 24-52 TGO processing 20-24
TGO Site $L_{Aeq(15min)}$ Contribution							22

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

4.7 Assessment Results - Location R23

The results of the attended noise measurements at location R23 for the September 2023 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 R23

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology[1]	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}			
18/09/2023	21:07 (Evening)	64	50	37	38	WD: NE WS: 0.6m/s Stab Class: E	Traffic 35-64 Insects <34 Livestock <35 TGO inaudible
		TGO Site $L_{Aeq(15min)}$ Contribution					<27
18/09/2023	22:22 (Night)	60	46	39	36	WD: NE WS: 0.5m/s Stab Class: E	Traffic 39-60 Insects <37 TGO inaudible
		TGO Site $L_{Aeq(15min)}$ Contribution					<29
19/09/2023	21:05 (Evening)	61	48	41	38	WD: N WS: 3.5m/s Stab Class: D	Traffic 37-61 Dogs barking 47-56 Wind in trees 44-47 TGO inaudible
		TGO Site $L_{Aeq(15min)}$ Contribution					<31
19/09/2023	22:22 (Night)	60	45	39	36	WD: N WS: 4.5m/s Stab Class: D	Insects <35 Dogs barking 43-50 Traffic 38-60 Wind in trees 39-54 TGO inaudible
		TGO Site $L_{Aeq(15min)}$ Contribution					<29
20/09/2023	20:59 (Evening)	80	48	37	38	WD: SW WS: 0.5m/s Stab Class: E	Traffic 35-80 Insects <33 Livestock <37 TGO inaudible
		TGO Site $L_{Aeq(15min)}$ Contribution					<27
20/09/2023	22:21 (Night)	58	46	37	36	WD: SW WS: 0.3m/s Stab Class: D	Traffic 39-58 Livestock <35 TGO inaudible
		TGO Site $L_{Aeq(15min)}$ Contribution					<27

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

5 Discussion

5.1 Discussion of Results - Location R2

Monitoring between Monday 18 September 2023 and Wednesday 20 September 2023 identified that TGO activities were audible on one occasion during the assessment period at location R2. The estimated mining contributions were measured between <20dBA and 29dBA, therefore TGO emissions remained below the relevant noise limit of 35dB $LA_{eq(15min)}$. Extraneous sources such as dogs barking, insects, traffic, wind in trees and livestock were audible during the measurement period.

5.2 Discussion of Results - Location R3/R29

Monitoring between Monday 18 September 2023 and Wednesday 20 September 2023 identified that TGO activities remained inaudible during the assessment period at location R3/R29. The estimated mining contributions were measured between <29dBA and <35dBA, therefore TGO emissions remained below the relevant noise limit of 35dB $LA_{eq(15min)}$. Extraneous sources such as traffic, wind in trees, dogs barking, and insects were audible during the measurement period.

5.3 Discussion of Results - Location R4

Monitoring between Monday 18 September 2023 and Wednesday 20 September 2023 identified that TGO activities were audible on two occasions during the assessment period at location R4. The estimated mining contributions were measured between <20dBA and <33dBA, therefore TGO emissions remained below the relevant noise limit of 35dB $LA_{eq(15min)}$. Extraneous sources such as traffic, wind in trees, insects, operator noise and offsite drilling were audible during the measurement period.

5.4 Discussion of Results - Location R5

Monitoring between Monday 18 September 2023 and Wednesday 20 September 2023 identified that TGO activities remained inaudible during the assessment period at location R5. The estimated mining contributions were measured between <28dBA and <35dBA, therefore TGO emissions remained below the relevant noise limit of 35dB $LA_{eq(15min)}$. Extraneous sources such as traffic, dogs barking, insects, wind in trees and offsite drilling were audible during the measurement period.

5.5 Discussion of Results - Location R6

Monitoring between Monday 18 September 2023 and Wednesday 20 September 2023 identified that TGO activities were audible on four occasions during the assessment period at location R6. The estimated mining contributions were measured between 22dBA and 35dBA, therefore the relevant noise limit of 35dB $LA_{eq(15min)}$ was satisfied. Extraneous sources such as traffic, insects, livestock, wind in trees and dog barking were audible during the measurement period.

5.6 Discussion of Results - Location R23

Monitoring Monday 18 September 2023 and Wednesday 20 September 2023 identified that TGO activities remained inaudible during the assessment period at location R23. The estimated mining contributions were measured between <27dBA and <31dBA, therefore the noise limit of 38dB $LA_{eq(15min)}$ for evening and 36dB $LA_{eq(15min)}$ for night was satisfied. Extraneous sources such as traffic, wind in trees, dogs barking, livestock and insects were audible during the measurement period.

6 Comparison of Attended and Unattended Monitoring Results

To address Condition 6 of Schedule 3 of the Project Approval, a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results has been completed.

The validation compares monthly attended monitoring results against the closest assessed unattended monitoring location. Currently, TGO has an unattended real-time monitoring terminal installed at the Brooklands property (nearest to R23). Figure 1 identifies the location of the monitor with respect to the attended monitoring locations. It is noted that the Brooklands unattended monitor is situated 600m west of the attended noise monitoring location R23, therefore, background (L_{A90}) noise levels are significantly lower due to offset distance to highway traffic.

Historically, a comparison of mine noise contributions between attended and unattended noise monitoring demonstrates a general consistency between attended and unattended results. It was noted that wind, insects, birds, and highway traffic noise influenced measured noise levels for this assessment. Furthermore, for September 2023, results remained below the relevant criteria for attended locations.

Table 9 provides a summary comparison of results between the attended and unattended noise surveys for R23.

Table 9 Comparison of Attended and Unattended Results

Assessment Type	Time (hrs)	Descriptor (dBA re 20 µPa)			Criteria	Mine Noise Contribution	Meteorology[1]	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}				
Monday 18 September 2023								
Attended	21:07	64	50	37	38	<27	WD: NE WS: 0.6m/s Stab Class: E	Traffic 35-64 Insects <34 Livestock <35 TGO inaudible
Unattended	21:00	58	43	32	38	<22		No audio trigger
Attended	22:22	60	46	39	36	<29	WD: NE WS: 0.5m/s Stab Class: E	Traffic 39-60 Insects <37 TGO inaudible
Unattended	22:15	57	41	29	36	<20		No audio trigger
Tuesday 19 September 2023								
Attended	21:05	61	48	41	38	<31	WD: N WS: 3.5m/s Stab Class: D	Traffic 37-61 Wind in trees 44-47 TGO inaudible
Unattended	21:00	60	44	33	38	<23		No audio trigger
Attended	22:22	60	45	39	36	<29	WD: N WS: 4.5m/s Stab Class: D	Insects <35 Traffic 38-60 Wind in trees 39-54 TGO inaudible
Unattended	22:15	59	43	34	36	<24		Traffic TGO inaudible
Wednesday 20 September 2023								
Attended	20:59	80	48	37	38	<27	WD: SW WS: 0.5m/s Stab Class: E	Traffic 35-80 Insects <33 Livestock <37 TGO inaudible
Unattended	21:00	51	40	32	38	<22		No audio trigger
Attended	22:21	58	46	37	36	<27	WD: SW WS: 0.3m/s Stab Class: D	Traffic 39-58 Livestock <35 TGO inaudible
Unattended	22:15	51	40	31	36	<21		Traffic TGO inaudible

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of Tomingley Gold Operations Pty Ltd (TGO). The assessment was completed to provide monthly monitoring data so that TGO can actively quantify and manage site noise emissions.

Attended monitoring conducted Monday 18 September 2023 and Wednesday 20 September 2023 identified that TGO mine noise were audible on several occasions during the measurement period. A review of monitoring data and operator attended observations determined that TGO contributions remained below relevant limits.

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Appendix A - Glossary of Terms

Several technical terms have been used in this report and are explained in **Table A1**.

Table A1 Glossary of Terms

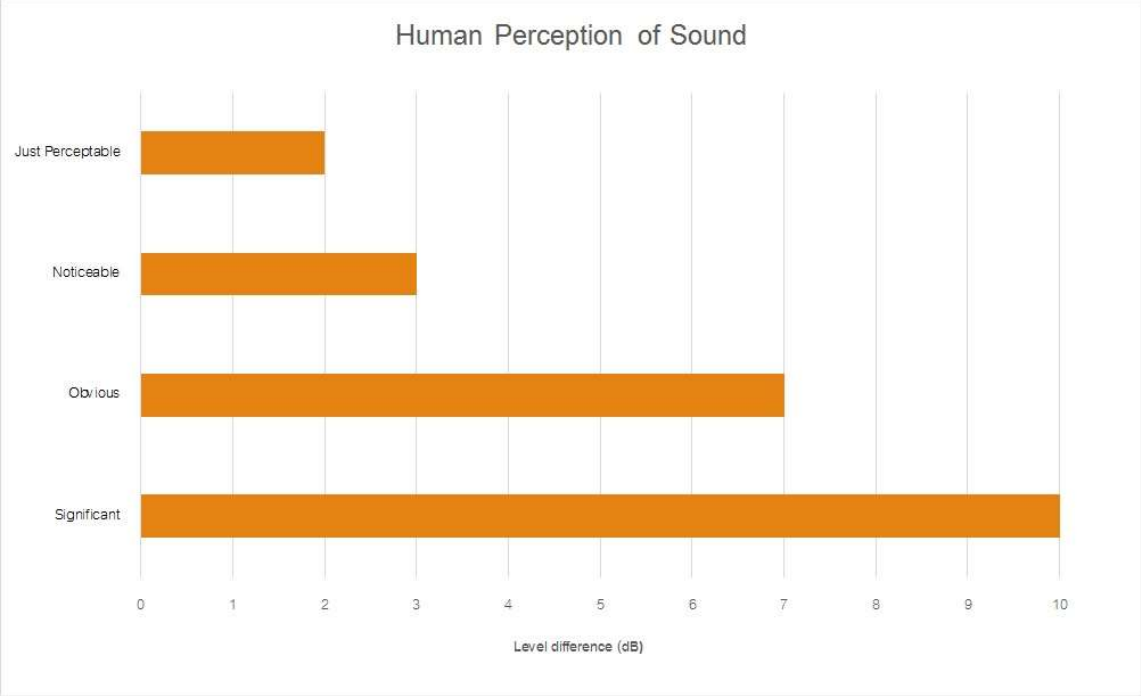
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
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)	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.
LAmax	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 (SWL)	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.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

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
Lawnmower (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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