

Monthly Environmental Monitoring Report

September 2018

Date	Rev.	Status
September 2018	A	Final

Table of Contents

1. Introduction.....	ii
2. Monitoring Requirements	iii
3. Dust Depositional Monitoring	vi
4. Total Suspended Particulates	viii
5. Real Time PM ₁₀ Monitoring	viii
6. Surface Water Monitoring	xi
7. Groundwater Monitoring.....	xii
8. Noise Monitoring	xii
9. Blast Monitoring	xii
10. Meteorological Monitoring.....	xiii

1. Introduction

The Mount Pleasant Operation (MPO) is located in the Upper Hunter Valley of New South Wales,

approximately three kilometres (km) north-west of Muswellbrook and approximately 50 km north-west of Singleton. The villages of Aberdeen and Kayuga are located 12 km north-northeast and 3 km north of the Project boundary, respectively.

The purpose of this Report is to provide a monthly update of monitoring data in accordance with the requirements of Environmental Protection Licence (EPL) 20850, Section 66(6) of the POEO Act and the MPO Project Approval DA 92/97.

Table 1-1 – Mount Pleasant Operations

Name of Operation	Mount Pleasant Operation
Name of Licensee	MACH Energy Australia Pty Ltd
Environmental Protection Licence	20850
Reporting Period Start Date	1 st September 2018
Reporting Period End Date	30 th September 2018
Date Data Received	17 th October 2018 (Noise Report – 6/11/18)

To view MPO EPL 20850 in full please refer to the link below.

<http://www.environment.nsw.gov.au>

2. Monitoring Requirements

The MPO Environment Protection Licence (EPL) 20850 specifically requires the monitoring of:

- 2 x Palas Fidas PM10 sites;
- Noise monitoring
- Blast monitoring; and
- Meteorological monitoring.

Monitoring of sites not required by the EPL are carried out in accordance with MPO Environmental Monitoring Program (EMP) and Project Approval DA 92/97.

The MPO Environmental Monitoring Network is shown in **Figure 2-1** and **Figure 1-2**.

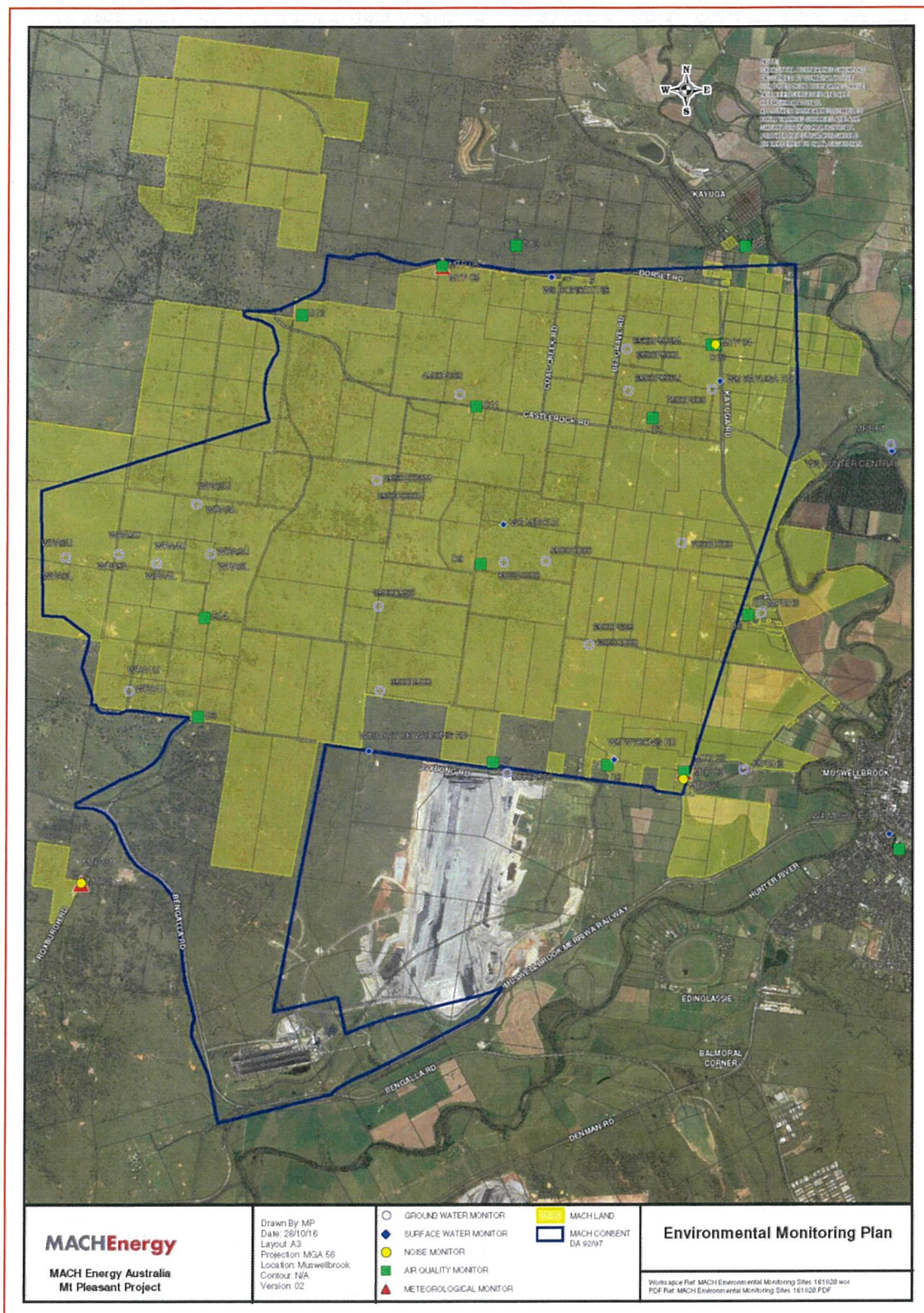


Figure 2-1 – MPO Environmental Monitoring Network

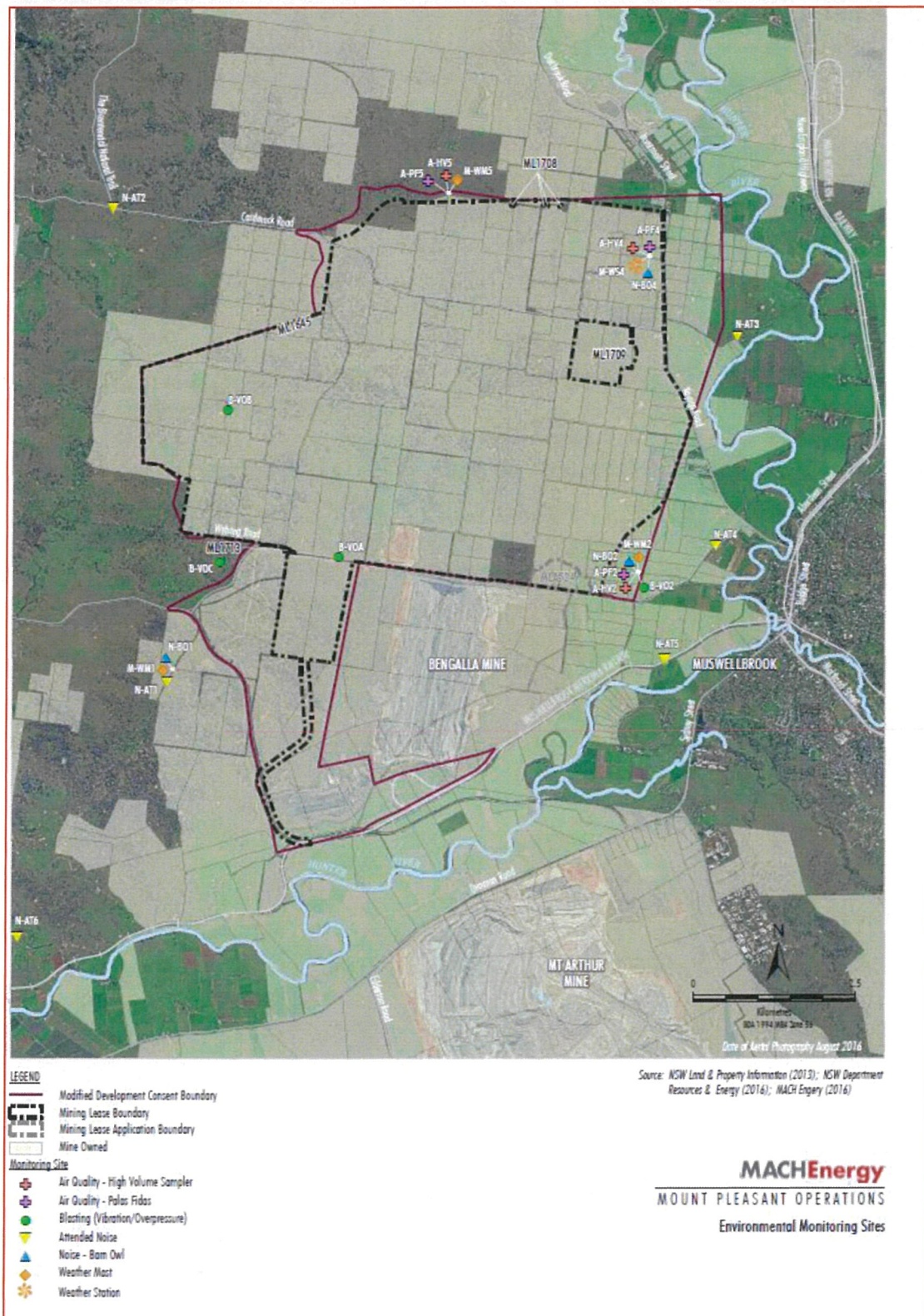


Figure 1-2 – MPO Environmental Monitoring Network/EPL Monitoring Sites

3. Dust Depositional Monitoring

Dust deposition was monitored according to the OEH's Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC 2007), which references AS/NZS 3580.10.1:2016 (R2014) Determination of particulate matter – Deposited matter – Gravimetric Method. The dust deposition exposure period for all gauges commenced on 19th July 2018. Sample collection was undertaken on 20th August 2018 by AECOM with sample analysis performed by SRT NATA accredited laboratory. The monitoring network comprises of 13 dust deposition gauges (DDG). Results for September 2018 are shown in **Table 3-1**.

Table 3-1: Dust Depositional Results – September 2018

Location	YTD Insoluble Solids (g/m2.month)	Insoluble Solids Annual Rolling Average (g/m2.month)
D1	1.5	1.4
D3	2.7	2.5
D4	1.8	1.7
D5	2.4	2.1
D6	3.3	3.1
D7	9.3	8.3
D8	3.8	4.1
D9	1.8	1.8
D10	1.4	1.4
D11	1.9	1.8
D12	1.1	1.1
D13	1.9	2.3
D14	3.4	3.2
Criterion	-	4
Results in bold indicate exceedances of adopted assessment criteria		

Note: Contaminated results are not included in the 12 month rolling average. Monthly results above 4g/m2/month are not classed as an exceedance of criteria as the criteria is an annual average of 4g/m2/month. **Figure 3-1** compares the monthly insoluble solids results to the annual averages for each dust gauge and the assessment criterion.

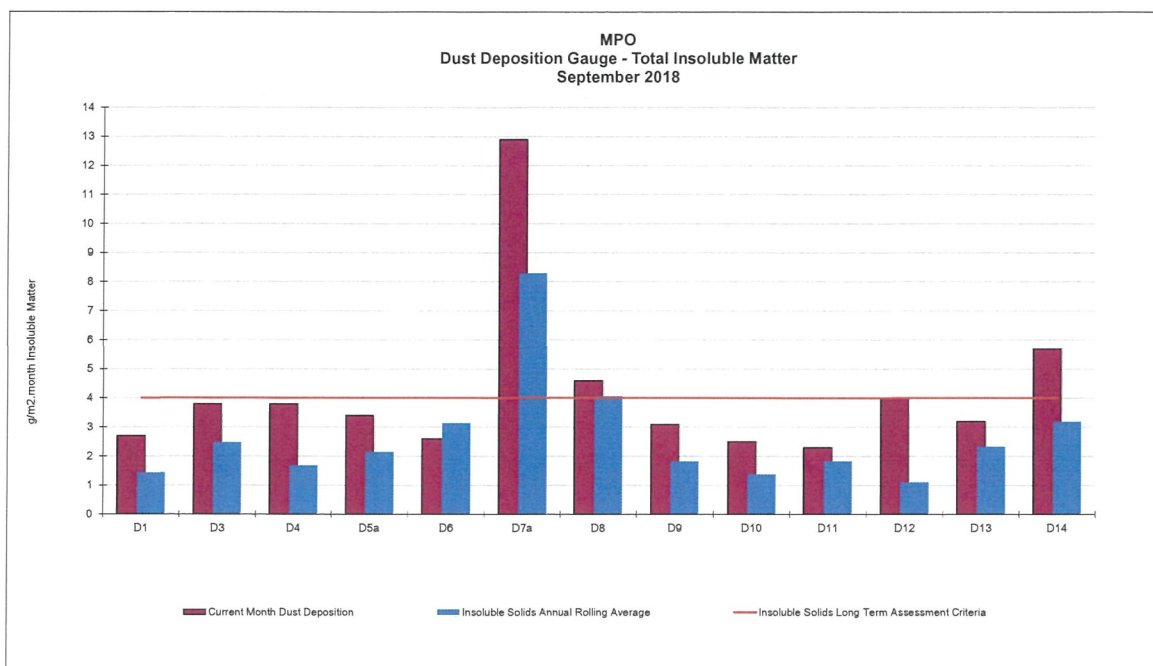


Figure 3-1: MPO DDG Total Insoluble Solids Monitoring Results – September 2018

Exceedances of the EPA annual average criterion for dust deposition (insoluble solids) were recorded at site D7a (8.3 g/m².month) and D8 (4.1 g/m².month). Field notes from the September sampling event noted that all the gauges contained insects. Evidence of vegetation and bird droppings were recorded in six gauges.

4. Total Suspended Particulates

All High Volume Air Samplers (HVAS) are run for 24 hours every six days in accordance with AM-15 of Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DECC, 2007), referencing AS/NZS 3580.9.3:2015 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) - High volume sampler gravimetric method, for the monitoring of TSP.

TSP results for the monitoring period are provided in **Table 4-1**.

Table 4-1 Total Suspended Particulate Monitoring Data – September 2018

Run Date	Assessment Criterion	TSP $\mu\text{g}/\text{m}^3$		
		HVAS A-PF2	HVAS M-WS4	HVAS A-PF5
4/09/2018	-	35	15	21
10/09/2018	-	39	26	24
16/09/2018	-	87	55	50
22/09/2018	-	172	48	44
28/09/2018	-	65	23	20
Monthly Mean	-	80	33	32
Annual Rolling Average	90	84	42	39

For the reporting period, the year to date average TSP data for HVAS A-PF2, HVAS M-WS4 and HVAS A-PF5 was below the annual average criterion of 90 $\mu\text{g}/\text{m}^3$ at all monitoring sites.

5. Real Time PM₁₀ Monitoring

Continuous particulate matter less than 10 μm (PM₁₀) monitoring was conducted by three (3) Palas Fidas units at MPO during September 2018.

The EPA identification numbers 1 and 2 refer to Palas Fidas Units installed on Wybong Road (A-PF2) and Castlerock Road (A-PF5) respectively. In addition, a third unit (A-PF4) is installed on Kayuga Road with data used for management purposes only.

Real time PM₁₀ results for September 2018 are illustrated in **Figure 5-1** and shown in **Table 5- 1**

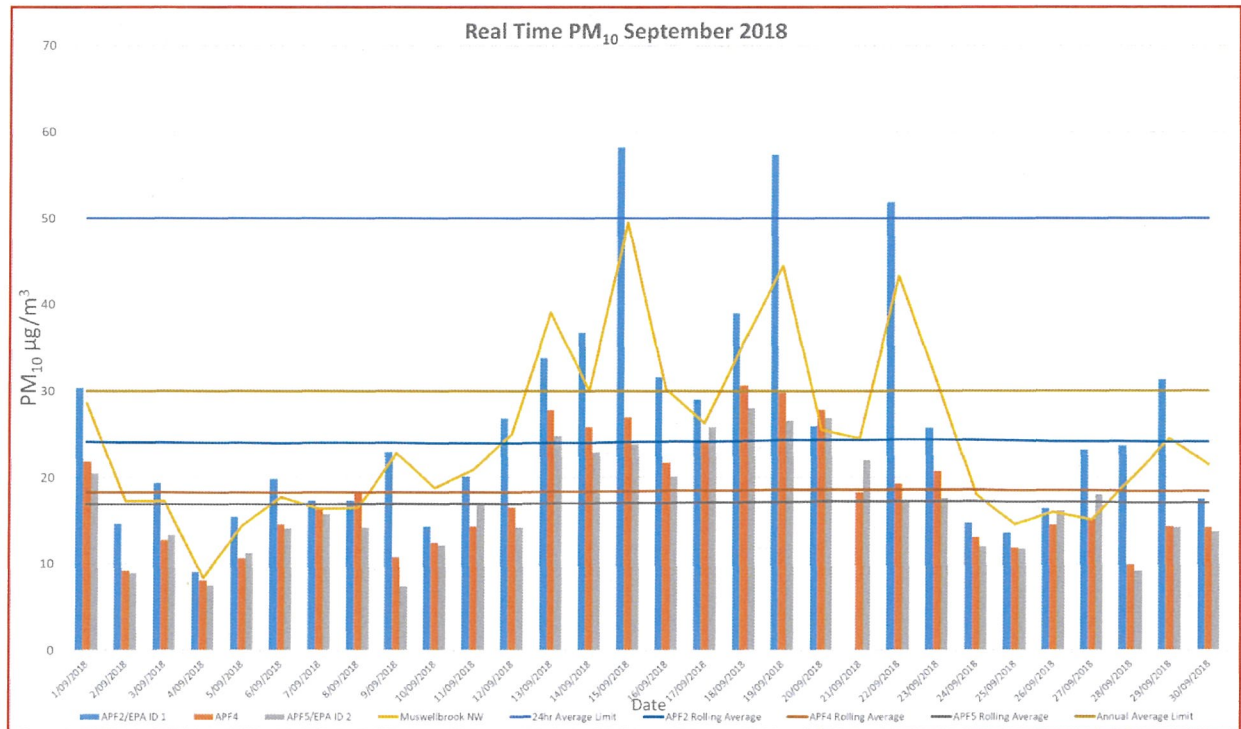


Figure 5-1 : MPO Daily Results from Palas Fidas – September 2018

Table 5.1: MPO Palas Fidas Data – September 2018

Date	A-PF2/EPA ID 1	A-PF4	APF5/EPA ID 2	OEH Muswellbrook NW	24hr Average Limit (µg/m³)
	Daily Result				
1/09/2018	30	22	20	28.6	50
2/09/2018	15	9	9	17.2	50
3/09/2018	19	13	13	17.2	50
4/09/2018	9	8	7	8.4	50
5/09/2018	15	11	11	14.4	50
6/09/2018	20	15	14	17.7	50
7/09/2018	17	16	16	16.4	50
8/09/2018	17	18	14	16.5	50
9/09/2018	23	11	7	22.8	50
10/09/2018	14	12	12	18.8	50
11/09/2018	20	14	17	20.9	50
12/09/2018	27	17	14	25	50
13/09/2018	34	28	25	39.1	50
14/09/2018	37	26	23	30	50
15/09/2018	58	27	24	49.5	50
16/09/2018	32	22	20	30.2	50
17/09/2018	29	24	26	26.3	50
18/09/2018	39	31	28	35.6	50
19/09/2018	57	30	27	44.5	50
20/09/2018	26	28	27	25.5	50
21/09/2018		18	22	24.5	50
22/09/2018	52	19	17	43.3	50
23/09/2018	26	21	18	30.9	50
24/09/2018	15	13	12	18	50
25/09/2018	14	12	12	14.6	50
26/09/2018	16	14	16	16	50
27/09/2018	23	15	18	15.1	50
28/09/2018	24	10	9	19.8	50
29/09/2018	31	14	14	24.5	50
30/09/2018	17	14	14	21.5	50

6. Surface Water Monitoring

Monthly surface water monitoring was conducted on 28 September 2018 by AECOM. Laboratory analysis was performed by SRT and SGS NATA accredited laboratories. **Table 6-1** shows the total suspended solids, electrical conductivity and pH for the routine monthly monitoring.

Table 6.1: MPO Surface Water Monitoring Results – September 2018

Sampling Point	pH	Electrical Conductivity (µs/cm)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)
W1	8.2	380	1	183
W2	8.1	540	<1	186
W3	8.2	420	7	230
W4	7.8	2000	4	1190
W5	*	*	*	*
W6A	8.3	370	1	201
W7	*	*	*	*
W9	*	*	*	*
W11	7.7	6300	1	3700
W12	8.1	5100	2	2860
W13	*	*	*	*
W14	*	*	*	*
W15	7.9	460	8	308
* dry or insufficient water Results in bold indicate exceedances of adopted assessment criteria				

Five of the thirteen monitoring locations were found to be dry on the sampling day. Sampling point W2 sample of Electrical Conductivity (µs/cm) was recorded above the trigger level values during September 2018.

Surface water sites W1 and W4 do not have trigger levels as they are located upstream of MPO and are not influenced by its activities. Site W3 does not have any trigger levels specified.

7. Groundwater Monitoring

Quarterly monitoring of groundwater is undertaken for depth to water (DTW), pH and electrical Monitoring did not occur during September 2018. The next sampling quarterly monitoring event is scheduled for November 2018.

8. Noise Monitoring

In accordance with the MPO Noise Management Plan, attended noise compliance monitoring is undertaken quarterly by a suitably qualified and experienced person. All monitoring measurements are undertaken during day, evening and night periods. For further details see the September Noise Monitoring report attached with this report.

9. Blast Monitoring

Results for September 2018 are presented in **Table 9-1**.

Table 9-1 – MPO Blast Monitoring Results – September 2018

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BV02
4/09/18	09:19	0.840 mm/s	96.8 DBL	0.280 mm/s	90.8 DBL	0.410 mm/s	113 DBL
6/09/18	09:04	0.840 mm/s	94.4 DBL	0.490 mm/s	90.2 DBL	1.680 mm/s	110 DBL
6/09/18	15:10	2.510 mm/s	101.5 DBL	0.490 mm/s	105 DBL	0.930 mm/s	108.9 DBL
13/09/18	13:42	0.570 mm/s	95.7 DBL	0.260 mm/s	91.6 DBL	0.820 mm/s	105.6 DBL
14/09/18	15:00	0.510 mm/s	93.5 DBL	0.180 mm/s	104.2 DBL	2.180 mm/s	102.5 DBL
20/09/18	15:09	Trigger Error	Trigger Error	0.270 mm/s	93 DBL	0.480 mm/s	112 DBL
21/09/18	15:08	1.010 mm/s	101.1 DBL	0.270 mm/s	93 DBL	0.480 mm/s	112 DBL
25/09/18	09:19	0.840 mm/s	96.8 DBL	0.280 mm/s	90.8 DBL	0.410 mm/s	113 DBL
27/09/18	09:04	0.840 mm/s	94.4 DBL	0.490 mm/s	90.2 DBL	1.680 mm/s	110 DBL

Blast results complied with all criteria at each monitoring site.

10. Meteorological Monitoring

Weather data is measured continuously at the Kayuga Road monitor (M-WS4). The M-WS4 weather station measures wind, temperature (10m), solar radiation, humidity, atmospheric pressure, and sigma theta. All data was captured during September 2018.

Mount Pleasant Operation

*Environmental Noise Monitoring
September 2018*

*Prepared for
MACH Energy Australia Pty Ltd*



Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
PO Box 3115 | Thornton NSW 2322
Telephone +61 2 4966 4333
Email global@globalacoustics.com.au
ABN 94 094 985 734

Mount Pleasant Operation

Environmental Noise Monitoring September 2018

Reference: 18293_R01

Report date: 6 November 2018

Prepared for

MACH Energy Australia Pty Ltd
1100 Wybong Road
Muswellbrook NSW 2333

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322



Prepared: Jesse Tribby
Consultant

QA Review: Amanda Borserio
Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

Global Acoustics Pty Ltd | PO Box 3115 | Thornton NSW 2322

Telephone +61 2 4966 4333 | Email global@globalacoustics.com.au

ABN 94 094 985 734

Table of Contents

1 INTRODUCTION.....	1
1.1 Background.....	1
1.2 Attended Monitoring Locations.....	1
1.3 Terminology & Abbreviations.....	3
2 PROJECT APPROVAL & CRITERIA.....	4
2.1 Mount Pleasant Project Approval.....	4
2.2 Noise Management Plan.....	4
2.3 Environmental Protection Licence.....	4
2.4 EPL Noise Criteria.....	4
2.5 Project Approval Cumulative Noise Criteria.....	5
2.6 Modifying Factors.....	5
2.6.1 Tonal and Intermittent Noise.....	5
2.6.2 Low- Frequency Noise.....	6
3 METHODOLOGY.....	7
3.1 Attended Noise Monitoring.....	7
3.2 Modifying Factors.....	8
3.3 Attended Noise Monitoring Equipment.....	8
4 RESULTS.....	9
4.1 Total Measured Noise levels.....	9
4.2 Modifying Factors.....	9
4.3 Attended Noise Monitoring.....	10
4.4 Atmospheric Conditions.....	11
5 DISCUSSION.....	12
5.1 Noted Noise Sources.....	12
5.1.1 N-AT1, Day.....	14
5.1.2 N-AT2, Day.....	15
5.1.3 N-AT3, Day.....	16
5.1.4 N-AT4, Day.....	17

5.1.5 N-AT5, Day.....	18
5.1.6 N-AT6, Day.....	19
6 SUMMARY OF COMPLIANCE.....	20

Appendices

A PROJECT APPROVAL, NOISE MANAGEMENT PLAN & EPL.....	21
B CALIBRATION CERTIFICATES.....	32

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by MACH Energy Australia to conduct monthly environmental noise monitoring around their Mount Pleasant Operation (MTP) near Muswellbrook, NSW.

Noise monitoring as described in this report was undertaken during the day period of 27 September 2018, at six monitoring locations in accordance with the MTP Environmental Protection Licence (EPL).

The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

1.2 Attended Monitoring Locations

There were six monitoring locations during this survey as detailed in Table 1.1 and shown on Figure 1. It should be noted that Figure 1 shows actual monitoring positions, not the location of residences.

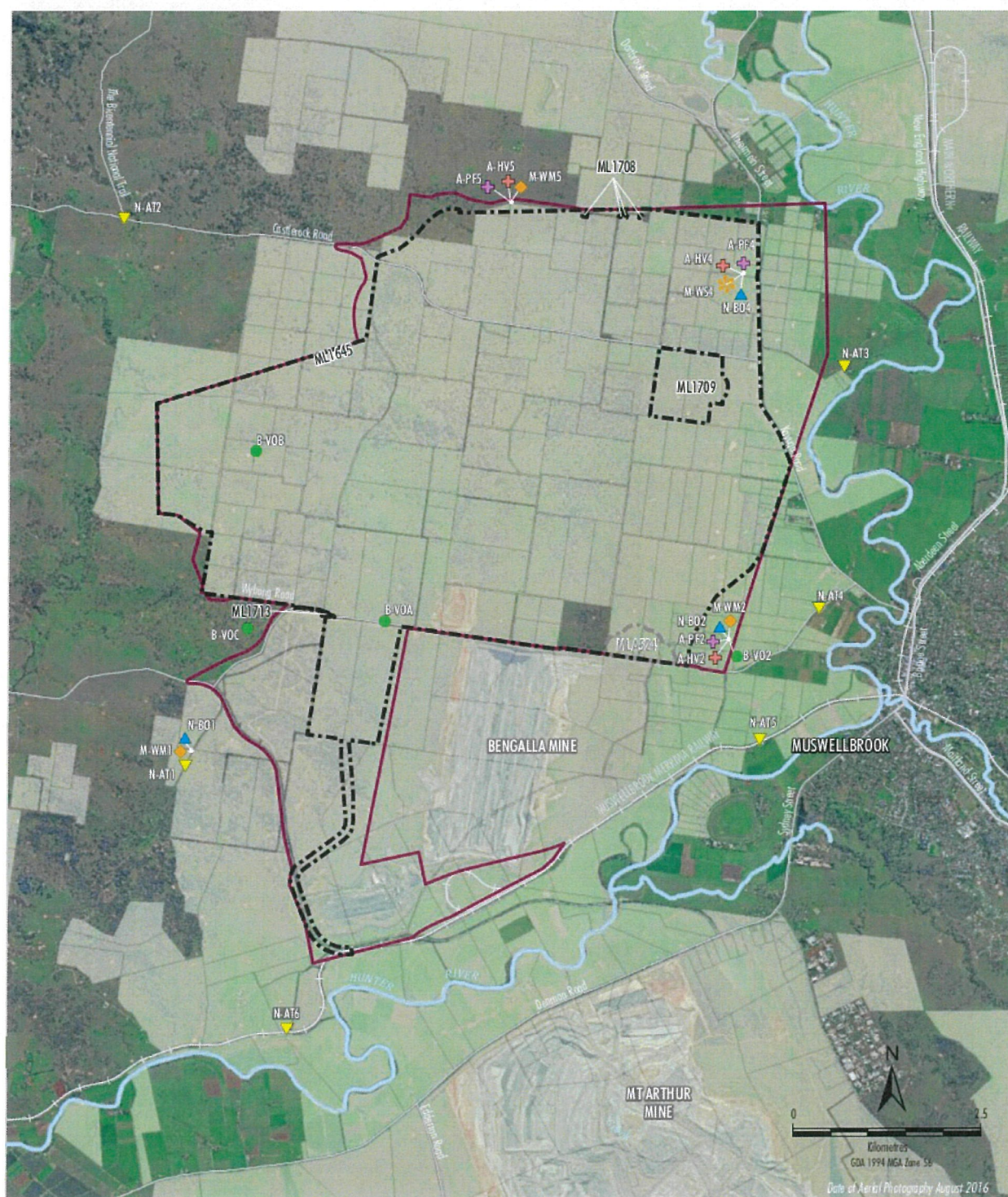
Monitoring locations are selected to represent the most noise affected residence in each of the Noise Affected Groups (NAG). Suitable monitoring locations, where noise levels are likely to be higher than those measured at the residence, are chosen to take a conservative approach as the direct measurement of noise 1 metre from the dwelling facades or within 30 metres of the residence is often impractical due to access requirements, the presence of dogs, air conditioners and other noise sources at the residences.

Table 1.1: ATTENDED NOISE MONITORING LOCATIONS

Descriptor	Assessment Location	NAG Represented	Monitoring Location
N-AT1	258	1	Roxburgh Road
N-AT2	272	2	Castlerock Road, Castle Rock
N-AT3	139	3/5	Wiltens Lane, Kayuga
N-AT4	74	6/7	Wybong Road, Muswellbrook
N-AT5	23	8/9	Logues Lane, Muswellbrook
N-AT6	-	10/11	Old Bengalla Road, Bengalla ¹

Notes:

1. While monitoring for N-AT6 was originally carried out at 599 Roxburgh Road, Mangoola, this monitoring location has been altered as of February 2017 in order to better represent receptors to the southwest of site; and
2. Monitoring at an additional location, N-AT7, will commence in November 2018 in order to better represent receptors to the northeast of site.



Source: MACH Energy 2016 – N-AT6 has been modified in this image to represent the current monitoring location at Old Bengalla Road, Bengalla.

Figure 1: MTP Noise Monitoring Locations

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations, which may be used in this report, are provided in Table 1.2.

Table 1.2: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
L _A	The A-weighted root mean squared (RMS) noise level at any instant
L _{Amax}	The maximum A-weighted noise level over a time period or for an event
L _{A1}	The noise level which is exceeded for 1 per cent of the time
L _{A10}	The noise level which is exceeded for 10 percent of the time, which is approximately the average of the maximum noise levels
L _{A50}	The noise level which is exceeded for 50 per cent of the time
L _{A90}	The level exceeded for 90 percent of the time, which is approximately the average of the minimum noise levels. The L _{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes
L _{Amin}	The minimum A-weighted noise level over a time period or for an event
L _{Aeq}	The average noise energy during a measurement period
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise
SPL	Sound pressure level (SPL), fluctuations in pressure measured as 10 times a logarithmic scale, the reference pressure being 20 micropascals
Hertz (Hz)	Cycles per second, the frequency of fluctuations in pressure, sound is usually a combination of many frequencies together
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location
NM	Not Measurable. If site noise is noted as NM or <30 dB, this means some noise was audible but could not be quantified
Day	This is the period 7:00am to 6:00pm
Evening	This is the period 6:00pm to 10:00pm
Night	This is the period 10:00pm to 7:00am

2 PROJECT APPROVAL & CRITERIA

2.1 Mount Pleasant Project Approval

The most current project approval associated with activities at MTP is the development application 'DA 92/97 MOD3' (August 2018). Sections 1 to 9 of Schedule 3 of the development application detail specific environmental conditions relating to noise associated with site operations. Relevant sections of the project approval are reproduced in Appendix A.

2.2 Noise Management Plan

Noise monitoring requirements are detailed in the MTP 'Noise Management Plan' (NMP). The most recent version of the NMP was approved in February 2018. Relevant sections are reproduced in Appendix A.

2.3 Environmental Protection Licence

Environmental monitoring requirements are detailed in the Environmental Protection Licence (EPL) No. 20850. The most recent version of the EPL is dated October 2018 with relevant sections reproduced in Appendix A.

2.4 EPL Noise Criteria

Site-only noise levels from MTP are compared with EPL limits which are detailed in Table 2.1.

Table 2.1: EPL NOISE CRITERIA, dB(A)

Descriptor	Assessment Location	NAG Represented	Day L _{Aeq,15min}	Evening L _{Aeq,15min}	Night L _{Aeq,15min}	Night Criterion L _{A1,1min}
N-AT1	258	1	40	40	40	45
N-AT2	272	2	36	36	36	45
N-AT3	139	3/5	35	35	35	45
N-AT4	74	6/7	43	42	42	45
N-AT5	23	8/9	40	40	40	45
N-AT6	-	10/11	35	35	35	45

Notes:

1. While monitoring for N-AT6 was originally carried out at 599 Roxburgh Road, Mangoola, this monitoring location has been altered as of February 2017 in order to better represent receptors to the southwest of site.

The EPL outlines the required meteorological conditions in Section 3, Limit Conditions, as follows:

L2.3 The noise limits set out in this licence apply under all meteorological conditions except for the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- 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.

For the purposes of assessing quarterly compliance, the meteorological conditions noted above have been used in accordance with the EPL.

2.5 Project Approval Cumulative Noise Criteria

Cumulative noise criteria are sourced from the project approval and outlined in Table 2.2. By definition, cumulative noise refers to noise from MTP in conjunction with noise from one or more other mines. If MTP is inaudible or the only noise source, the measured cumulative noise is defined as 'Nil'.

Table 2.2: MTP PROJECT APPROVAL CUMULATIVE NOISE CRITERIA, dB^{1,2,3}

Location	Day LAeq,15min	Evening LAeq,15min	Night LAeq,15min
NAG 8 and 9	55	45	40
All other privately-owned land	50	45	40

2.6 Modifying Factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017, and supersedes the EPA's Industrial Noise Policy (INP, 2000). Assessment and reporting of modifying factors is to be carried out in accordance with Fact Sheet C of the NPfI.

NPfI modifying factors, as they are applicable to mining noise, are described in more detail below.

2.6.1 Tonal and Intermittent Noise

As defined in the NPfI:

Tonal noise contains a prominent frequency and is characterised by a definite pitch.

Intermittent noise is noise where the level suddenly drops/increases several times during the assessment period, with a noticeable change in source noise level of at least 5 dB(A); for example, equipment cycling on and off. The intermittency correction is not intended to be applied to changes in noise level due to meteorology.

2.6.2 Low-Frequency Noise

As defined in the NPfI:

Low frequency noise is noise with an unbalanced spectrum and containing major components within the low-frequency range (10 – 160 Hz) of the frequency spectrum.

The NPfI contains the current method of assessing low-frequency noise, which is a 2 step process as detailed below:

Measure/assess source contribution C-weighted and A-weighted $L_{eq,T}$ levels over the same time period. The low frequency noise modifying factor correction is to be applied where the C-A level is 15 dB or more and:

- where any of the 1/3 octave noise levels in Table C2 are exceeded by **up to and including** 5 dB and cannot be mitigated, a 2 dBA positive adjustment to measured A weighted levels applies for the evening/night period; and*
- where any of the 1/3 octave noise levels in Table C2 are exceeded by **more than** 5 dB and cannot be mitigated, a 5 dBA positive adjustment to measured A weighted levels applies for the evening/night period and a 2 dBA positive adjustment applies for the daytime period.*

Table C2 and associated notes from the NPfI is reproduced below:

Table C2: One-third octave low-frequency noise thresholds.

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

Notes:

- dB(Z) = decibel (Z frequency weighted).
- For the assessment of low-frequency noise, care should be taken to select a wind screen that can protect the microphone from wind-induced noise characteristics at least 10 dB below the threshold values in Table C2 for wind speeds up to 5 metres per second. It is likely that high performance larger diameter wind screens (nominally 175 mm) will be required to achieve this performance (Hessler, 2008). In any case, the performance of the wind screen and wind speeds at which data will be excluded needs to be stated.
- Low-frequency noise corrections only apply under the standard and/or noise-enhancing meteorological conditions.
- Where a receiver location has had architectural acoustic treatment applied (including alternative means of mechanical ventilation satisfying the Building Code of Australia) by a proponent, as part of consent requirements or as a private negotiated agreement, alternative external low-frequency noise assessment criteria may be proposed to account for the higher transmission loss of the building façade.
- Measurements should be made between 1.2 and 1.5 metres above ground level unless otherwise approved through a planning instrument (consent/approval) or environment protection licence, and at locations nominated in the development consent or licence.

3 METHODOLOGY

3.1 Attended Noise Monitoring

Noise monitoring was conducted in accordance with the Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Atmospheric condition measurement was also undertaken.

Noise monitoring was conducted by Jason Cameron.

During this survey, monthly attended monitoring was undertaken during the day period, once at each location. Evening and night monitoring will commence once site operations during these periods begins. The duration of each measurement was 15 minutes.

Attended monitoring is preferred to the use of noise loggers when determining compliance with prescribed limits; it allows an accurate determination of the contribution, if any, to measured noise levels by the source of interest (in this case MTP).

If the exact contribution of the source of interest cannot be established, due to masking by other noise sources in a similar frequency range, but site noise levels are observed to be well below (more than 5 dB lower than) any relevant criterion, a maximum estimate of the potential contribution of the site might be made based on other measured site-only noise levels, for example, L_{A10} , L_{A50} or L_{A90} . This is generally expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may also be used in this report. When site noise is noted as IA, no site noise was audible at the monitoring location. When site noise is noted as NM, this means some noise was audible but could not be quantified. If site noise was NM due to masking but estimated to be significant in relation to a relevant criterion, we would employ methods (e.g. measure closer and back calculate) to determine a value for reporting.

All sites noted as NM in this report are due to one or more of the following reasons:

- site noise levels were extremely low and unlikely, in many cases, to be even noticed;
- site noise levels were masked by another relatively loud noise source that is characteristic of the environment (e.g. breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer; and/or
- it was not feasible or reasonable to employ methods such as move closer and back calculate. Cases may include, but are not limited to, rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate

A measurement of $L_{A1,1\text{minute}}$ corresponds to the highest noise level generated for 0.6 second during one minute. In practical terms this was quantified by measuring or estimating the highest noise level emitted

from a MTP noise source during the entire measurement period (i.e. the highest level of the worst minute during the 15 minute measurement).

Meteorological data used to determine if criteria apply has been sourced from the MTP Station.

3.2 Modifying Factors

Years of monitoring have indicated that noise levels from mining operations, particularly those measured at significant distances from the source are relatively continuous and broad spectrum. Given this, noise levels from MTP at the monitoring locations are unlikely to be intermittent or tonal.

Assessment of low-frequency modifying factors is necessary when application of the maximum correction could potentially result in an exceedance of the relevant site-only L_{Aeq} criterion. Low-frequency analysis is therefore undertaken for measurements in this report where:

- meteorological conditions resulted in criteria being applicable;
- contributions from MTP were audible and directly measurable, such that the site-only L_{Aeq} was not “NM” or less than a maximum cut off value (e.g. “<20 dB” or “<30dB”);
- contributions from MTP were within 5 dB of the relevant L_{Aeq} criterion, as 5 dB is the maximum penalty that can be applied by low-frequency modifying factors; and
- MTP was the dominant low-frequency noise source.

All measurements meeting these conditions were evaluated for possible low-frequency penalty applicability in accordance with the NPfL.

3.3 Attended Noise Monitoring Equipment

Table 3.1 lists the equipment used to measure environmental noise levels. Calibration certificates are provided in Appendix B.

Table 3.1: ATTENDED NOISE MONITORING EQUIPMENT

Model	Serial Number	Calibration Due Date
Rion NA-28 sound level meter	01070590	26/06/2020
Pulsar Model 106 acoustic calibrator	79631	30/03/2019

4 RESULTS

4.1 Total Measured Noise levels

Overall noise levels measured at each location during attended monitoring are provided in Table 4.1.

Table 4.1: TOTAL MEASURED NOISE LEVELS – SEPTEMBER 2018¹

Location	Start Date and Time	L _{Amax} dB	L _{A1} dB	L _{A10} dB	L _{A50} dB	L _{Aeq} dB	L _{A90} dB	L _{Amin} dB	L _{Ceq} dB
N-AT1	27/09/2018 14:21	60	44	32	29	35	27	25	51
N-AT2	27/09/2018 13:39	49	39	31	26	29	23	20	47
N-AT3	27/09/2018 13:04	52	46	42	37	39	33	30	52
N-AT4	27/09/2018 12:31	58	50	43	37	40	33	30	- ²
N-AT5	27/09/2018 12:05	60	47	40	32	37	30	27	49
N-AT6	27/09/2018 14:51	59	48	37	30	36	26	24	51

Notes:

1. Levels in this table are not necessarily the result of activity at MTP; and
2. Data not available due to technical difficulties.

4.2 Modifying Factors

Measured MTP only noise levels were assessed for the applicability of modifying factors in accordance with the EPA's NPfI.

There were no intermittent or tonal noise sources, as defined in the NPfI, audible from site during the survey.

None of the measurements in this survey satisfied the conditions outlined in Section 3.2. No further assessment of low-frequency noise was required.

4.3 Attended Noise Monitoring

Table 4.2 compares measured $L_{Aeq,15\text{minute}}$ levels for MTP with site-only noise criteria detailed in the EPL.

Table 4.2: $L_{Aeq,15\text{minute}}$ GENERATED BY MTP AGAINST NOISE CRITERIA – SEPTEMBER 2018

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies ¹	MTP Only L_{Aeq} dB ^{2,4}	Exceedance dB ^{3,4}
N-AT1	27/09/2018 14:21	2.1	A	40	Yes	IA	Nil
N-AT2	27/09/2018 13:39	1.8	B	36	Yes	IA	Nil
N-AT3	27/09/2018 13:04	2.2	C	35	Yes	IA	Nil
N-AT4	27/09/2018 12:31	1.6	A	43	Yes	32	Nil
N-AT5	27/09/2018 12:05	1.5	A	40	Yes	30	Nil
N-AT6	27/09/2018 14:51	2.0	C	35	Yes	IA	Nil

Notes:

1. Noise emission limits apply do not apply during wind speeds greater than 3m/s at 10m above ground level, or stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level, or stability category G temperature inversion conditions;
2. Estimated or measured $L_{Aeq,15\text{minute}}$ attributed to MTP;
3. NA in exceedance column means atmospheric conditions outside those specified in project approval and so criterion is not applicable; and
4. Bold results in red indicate exceedance of criteria.

Table 4.3 compares cumulative noise levels for all mines against cumulative noise level criteria.

Table 4.3: CUMULATIVE MINING NOISE AGAINST CUMULATIVE NOISE CRITERIA – SEPTEMBER 2018

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies ¹	Mining L_{Aeq} dB ^{2,4,5}	Exceedance dB ^{3,4}
N-AT1	27/09/2018 14:21	2.1	A	50	Yes	Nil	Nil
N-AT2	27/09/2018 13:39	1.8	B	50	Yes	Nil	Nil
N-AT3	27/09/2018 13:04	2.2	C	50	Yes	Nil	Nil
N-AT4	27/09/2018 12:31	1.6	A	50	Yes	Nil	Nil
N-AT5	27/09/2018 12:05	1.5	A	55	Yes	Nil	Nil
N-AT6	27/09/2018 14:51	2.0	C	50	Yes	Nil	Nil

Notes:

1. Noise emission limits apply do not apply during wind speeds greater than 3m/s at 10m above ground level, or stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level, or stability category G temperature inversion conditions;
2. Estimated or measured $L_{Aeq,15\text{minute}}$ attributed to cumulative mine noise;
3. NA in exceedance column means atmospheric conditions outside those specified in project approval and so criterion is not applicable;
4. Bold results in red indicate exceedance of criteria; and
5. By definition, cumulative noise refers to noise from MTP in conjunction with noise from one or more other mines. If MTP is inaudible or the only noise source, the measured cumulative noise is defined as 'Nil'.

4.4 Atmospheric Conditions

Atmospheric condition data measured by the operator at each location using a Kestrel hand-held weather meter is shown in Table 4.4. Atmospheric condition data is recorded during each measurement to show conditions near the microphone during the monitoring period.

Table 4.4: MEASURED ATMOSPHERIC CONDITIONS – SEPTEMBER 2018

Location	Start Date and Time	Temperature °C	Wind Speed m/s	Wind Direction °MN	Cloud Cover 1/8s
N-AT1	27/09/2018 14:21	22	1.3	45	0
N-AT2	27/09/2018 13:39	20	1.3	110	0
N-AT3	27/09/2018 13:04	21	1.1	240	1
N-AT4	27/09/2018 12:31	23	0.8	60	0
N-AT5	27/09/2018 12:05	19	0.9	120	0
N-AT6	27/09/2018 14:51	22	1.0	220	0

Notes:

1. Temperature, wind speed and direction measured at 1.8 metres; and
2. "-" indicates calm conditions at monitoring location.

MTP weather station data is used to determine compliance with specified noise criteria.

5 DISCUSSION

5.1 Noted Noise Sources

Table 4.1 to Table 4.3 present data gathered during attended monitoring. These noise levels are the result of many sounds reaching the sound level meter microphone during monitoring. Received levels from various noise sources were noted during attended monitoring and particular attention was paid to the extent of MTP's contribution, if any, to measured levels. At each receptor location, MTP's $L_{Aeq,15\text{minute}}$ and $L_{A1,1\text{minute}}$ (in the absence of any other noise) was, where possible, measured directly, or, determined by frequency analysis. Time variations of noise sources in each measurement, their temporal characteristics, are taken into account via statistical descriptors.

From these observations summaries have been derived for each location. The following sections provide these summaries. Statistical 1/3 octave band analysis of environmental noise was undertaken, and Figure 3 to Figure 7 display the frequency ranges for various noise sources at each location for L_{A1} , L_{A10} , L_{Aeq} , L_{A50} , and L_{A90} . These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 2 where it can be seen that frogs and insects are generating noise at frequencies above 1000 Hz, mining noise is at frequencies less than 1000 Hz (this is typical). Adding levels at frequencies that relate to mining only allows separate statistical results to be calculated. This analysis cannot always be performed if there are significant levels of other noise at the same frequencies as mining, this can be dogs, cows, or most commonly, road traffic.

It should be noted that the method of summing statistical values up to a cut-off frequency can overstate the L_{A1} result by a small margin but is entirely accurate for L_{Aeq} .

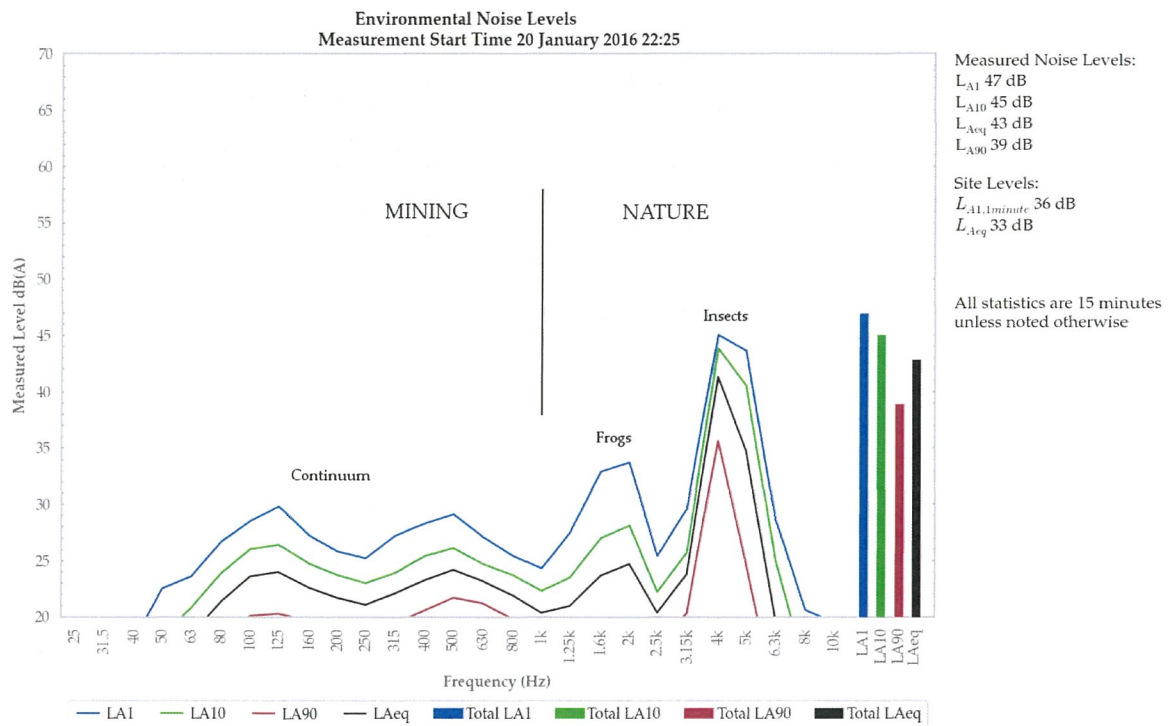


Figure 2: Sample Graph (See Section 5.1 for explanatory note)

5.1.1 N-AT1, Day

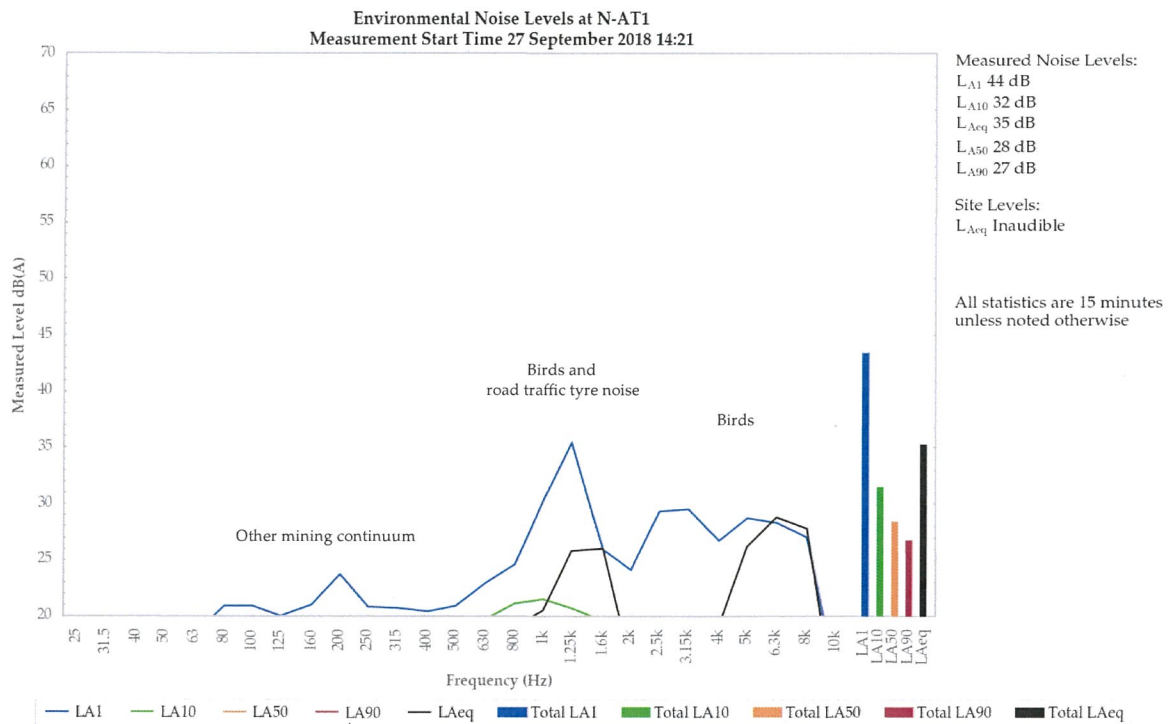


Figure 3: Environmental Noise Levels, N-AT1 – Roxburgh Road

MTP was inaudible during the measurement.

Birds were responsible for the measured L_{A1} and L_{Aeq} . Road traffic tyre noise and continuum from another mining operation generated the measured L_{A10} , L_{A50} , and L_{A90} .

5.1.2 N-AT2, Day

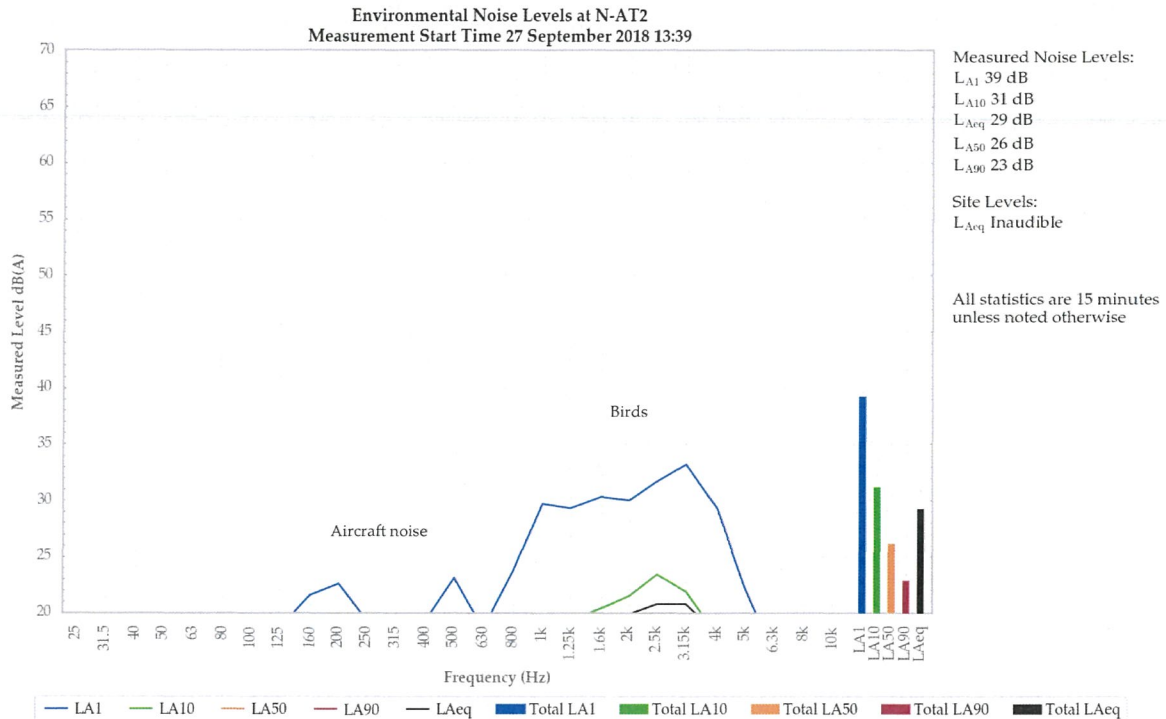


Figure 4: Environmental Noise Levels, N-AT2 – Castlerock Road

MTP was inaudible during the measurement.

Birds generated all measured noise levels.

Aircraft noise was also noted.

5.1.3 N-AT3, Day

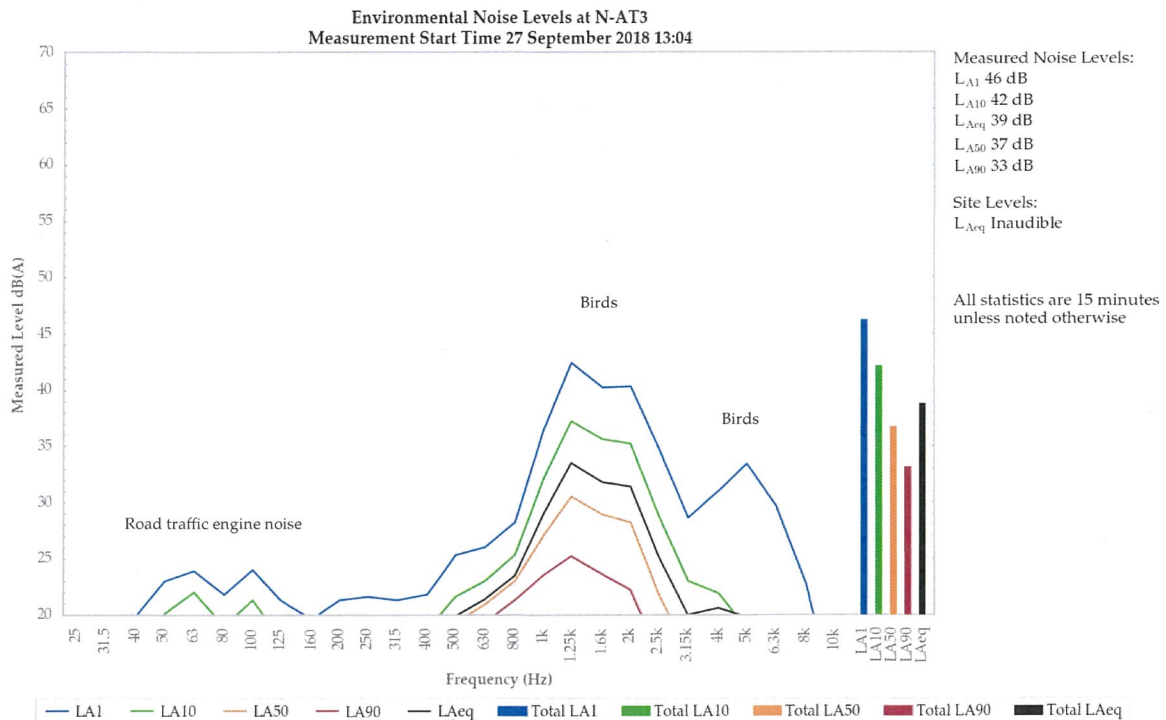


Figure 5: Environmental Noise Levels, N-AT3 – Wiltons Lane

MTP was inaudible during the measurement.

Birds generated all measured noise levels.

Road traffic noise and local impact noises were also noted.

5.1.4 N-AT4, Day

(A graph was not available for this measurement due to technical difficulties with this measurement)

Mining continuum from MTP was audible throughout the measurement and generated a site-only L_{Aeq} of 32 dB.

Birds were primarily responsible for all measured noise levels. Road traffic tyre noise and aircraft noise contributed to the measured L_{A10} and L_{Aeq} . Continuum from MTP contributed to the measured L_{A50} and L_{A90} .

Train horns were also noted.

5.1.5 N-AT5, Day

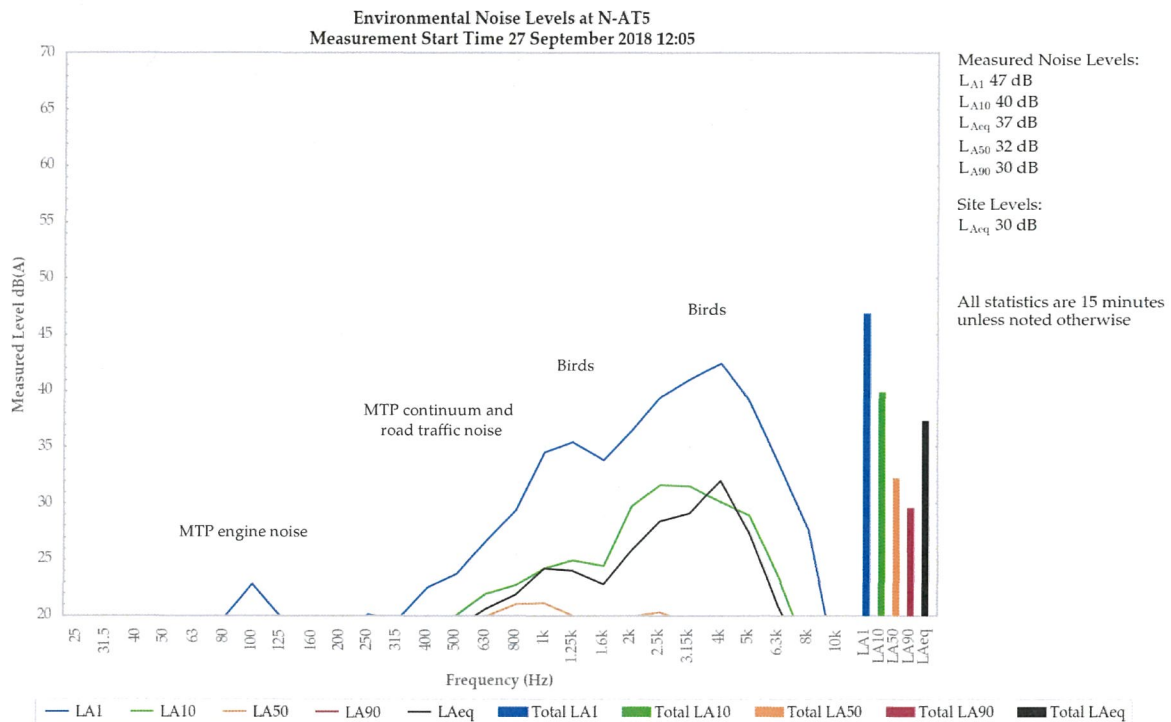


Figure 6: Environmental Noise Levels, N-AT5 – Logues Lane

Mining continuum from MTP was audible throughout the measurement and generated a site-only L_{Aeq} of 30 dB. Engine, track and transmission noise were also noted.

Birds were responsible for the measured L_{A1} , L_{A10} , and L_{Aeq} and contributed to the measured L_{A50} . MTP continuum contributed to the measured L_{A50} and generated the measured L_{A90} .

Road traffic noise was also noted.

5.1.6 N-AT6, Day

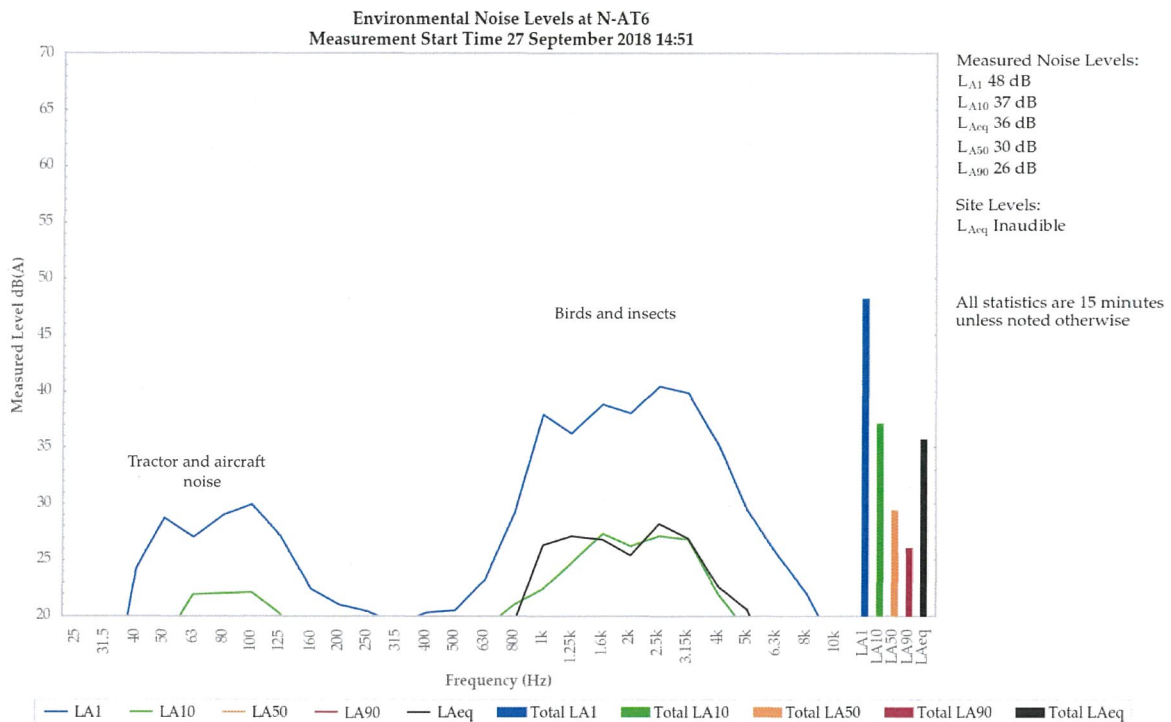


Figure 7: Environmental Noise Levels, N-AT6 – Old Bengalla Road

MTP was inaudible during the measurement.

Birds and insects were responsible for the measured L_{A1} , L_{A10} , and L_{Aeq} . Road traffic noise generated the measured L_{A50} and L_{A90} .

Aircraft noise and a tractor were also noted.

6 SUMMARY OF COMPLIANCE

Noise monitoring as described in this report was undertaken during the day period of 27 September 2018 at six monitoring locations.

The survey purpose is to quantify and describe the existing acoustic environment around the mine project and compare results with relevant limits.

Noise levels from MTP complied with noise limits at all monitoring locations during the September 2018 monitoring period.

Global Acoustics Pty Ltd

APPENDIX

A *PROJECT APPROVAL, NOISE MANAGEMENT PLAN & EPL*

A.1 MOUNT PLEASANT PROJECT APPROVAL (DA 92/97)

SCHEDULE 3 ENVIRONMENTAL PERFORMANCE CONDITIONS

ACQUISITION UPON REQUEST

1. If the Applicant receives a written request for acquisition from the owner of any land listed in Table 1, then the Applicant must acquire the land in accordance with the procedures in conditions 6-7 of Schedule 4.

Table 1: Land subject to acquisition upon request

Basis	Receiver
Noise	45, 47, 67, 96, 102, 108, 112, 118, 120, 120c, 121, 136, 143a, 143b, 147, 153a, 156a, 157a, 158, 159
Noise & Air	43, 43b
Air	20 ² , 21 ²

Notes:

- 1 To identify the locations referred to in Table 1, see the figures in Appendix 5.
- 2 The Applicant is only required to acquire and/or install mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla mine.

ADDITIONAL MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on any land listed in Table 1 (unless the owner of that land has requested acquisition) or Table 2, the Applicant must implement additional:
 - (a) noise mitigation measures (such as double-glazing, insulation and/or air conditioning); and/or
 - (b) air quality mitigation measures (such as air filters, a first flush roof water drainage system and/or air conditioning).
 at the residence(s) in consultation with the owner.

These measures must be reasonable and feasible, and directed towards reducing the noise and/or air quality impacts of the development on the residence(s). The Applicant must also be responsible for the reasonable costs of ongoing maintenance of these additional mitigation measures until the cessation of mining operations.

If within 3 months of receiving this request from the owner, the Applicant 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 2: Land where additional mitigation measures are available on request

Basis	Receiver
Noise	68, 74, 77, 79, 80a, 84a, 86a, 139, 140a, 140c, 154, 203, 257, 258, 259, 526

Note:

- 1 To identify the locations referred to in Table 2, see the figures in Appendix 5.

NOISE

Noise Criteria

3. Except for the noise-affected land referred to in Table 1, the Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land.

Table 3: Noise criteria dB(A)

Receiver or other location	Day	Evening	Night	
	L _{Aeq} (15min)	L _{Aeq} (15min)	L _{Aeq} (15min)	L _{A1} (1min)
68, 74	43	42	42	45
86a	42	42	42	45
35, 35b, 77	42	41	41	45
79, 80a, 140c, 526	41	41	41	45
289	41	40	40	45
23, 84a, 139, 154, 203, 257, 258a	40	40	40	45
83	40	39	39	45
86b, 140a, 202, 259	39	39	39	45
198, 202b	38	38	38	45

260, 261	37	37	37	45
169, 272	36	36	36	45
NAG 5 - All privately-owned land	41	40	39	45
NAG 6 - All privately-owned land	37	37	37	45
NAG 7 - All privately-owned land	40	37	37	45
NAG 8 - All privately-owned land	41	39	39	45
NAG 9 - All privately-owned land	39	38	37	45
NAG 11 - All privately-owned land	37	36	35	45
All other privately-owned land	35	35	35	45

Notes:

- To identify the locations referred to in Table 3, see the figures in Appendix 5.
- Noise generated by the development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy, with the exception of the application of modifying factors under Fact Sheet C of the Noise Policy for Industry.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner to exceed the criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

4. Deleted

Cumulative Noise Criteria

- Except for the noise-affected land referred to in Table 1, the Applicant **must** implement all reasonable and feasible measures to ensure that the noise generated by the development combined with the noise generated by other mines in the area does not exceed the criteria in Table 5 at any residence on privately-owned land.

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

Location	Day	Evening	Night
NAG 8, 9	55	45	40
All other privately-owned land	50	45	40

Notes:

- To identify the locations referred to in Table 5, see the figures in Appendix 5; and
- Cumulative noise is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.

Rail Noise

- The Applicant **must** ensure that its rail spur is only accessed by locomotives that are approved to operate on the NSW rail network in accordance with the noise limits in RailCorp's EPL (No. 12208) and ARTC's EPL (No. 3142).

Noise Operating Conditions

- The Applicant **must**:
 - implement best practice noise management, including all reasonable and feasible noise mitigation measures to minimise the **construction**, operational, low frequency, and rail noise generated by the development;
 - minimise the noise impacts of the development during temperature inversions;
 - regularly assess the real-time noise monitoring and meteorological forecasting data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this consent; and
 - co-ordinate the noise management on site with the noise management at nearby mines (including the Bengalla mine) to minimise the cumulative noise impacts of the mines, to the satisfaction of the **Secretary**.

Note: Monitoring under this consent is not required at all residences and the use of representative monitoring locations can be used to demonstrate compliance with criteria, if agreed to by the Secretary.

Noise Management Plan

- The Applicant **must** prepare a Noise Management Plan for the development to the satisfaction of the **Secretary**. This plan must:

- (a) be submitted to the Secretary for approval prior to carrying out any development on site;
- (b) describe the noise mitigation measures that would be implemented to ensure compliance with the relevant conditions of this consent, including a real-time noise management system that employs both reactive and proactive mitigation measures;
- (c) include a noise monitoring program that:
 - uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the development;
 - accounts for the occurrence of any noise enhancement between the site, and any sensitive receivers located beyond the site boundary; and
 - includes a protocol for determining exceedances of the relevant conditions of this consent.
- (d) include a protocol that has been prepared in consultation with the owners of the nearby mines (including the Bengalla mine) 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.

A.2 MOUNT PLEASANT NOISE MANAGEMENT PLAN

9 NOISE MONITORING PROGRAM

9.1 GENERAL REQUIREMENTS

As per the requirements of Development Consent DA 92/97, the MPO noise monitoring program will comprise both attended (Section 9.2) and real-time (Section 9.3) noise monitoring.

The results of attended monitoring will be used to assess compliance with relevant noise impact assessment criteria. Real-time monitoring will be used as a management tool to assist MACH Energy to take pre-emptive actions to avoid potential non-compliances.

Meteorological monitoring will also be conducted (Section 9.4).

9.2 ATTENDED NOISE MONITORING

9.2.1 Purpose

Attended noise monitoring will be undertaken to determine compliance with the noise criteria in Development Consent DA 92/97.

9.2.2 Monitoring Locations

Attended noise monitoring will initially be undertaken at the nominal locations described in Table 15 and shown on Figure 6.

Table 15
Indicative Operator-attended Noise Monitoring Locations

Location				Frequency ¹	Justification
Site ID	Description	Easting	Northing		
N-AT1	South-west of the MPO	291465	6427182	Quarterly	Representative of dwellings to the south-west (i.e. NAG 1)
N-AT2	North-west of the MPO	290608	6434490	Quarterly	Representative of dwellings to the north-west (i.e. NAG 2)
N-AT3	East of the MPO	300270	6432503	Quarterly	Representative of dwellings to the north-east and east (i.e. NAGs 3, 4 and 5)
N-AT4	South-east of the MPO	299947	6429264	Quarterly	Representative of dwellings to the east (i.e. NAGs 6 and 7)
N-AT5	South-east of the MPO	299161	6427503	Quarterly	Representative of dwellings to the south-east (i.e. NAGs 8 and 9)
N-AT6	South-west of the MPO	289092	6423155	Quarterly	Representative of dwellings to the south-west (i.e. NAGs 10 and 11)

¹ Operator-attended noise monitoring will be undertaken quarterly at each monitoring location in accordance with Condition M4.1 of EPL 20850, however, more frequent monitoring may be conducted at a subset of sites (e.g. those in close proximity to operations) as required.

Monitoring locations have been selected as being representative of residential and other sensitive receivers in the vicinity of mining at the MPO. Locations were also selected based on prevailing weather conditions and with consideration given to the privacy of residents. These nominal locations will be periodically updated based on noise monitoring results and review of applicable EPL 20850 requirements that may be updated by the EPA from time to time.

9.2.3 Methodology

The operator-attended noise monitoring will be conducted on a quarterly basis in accordance with Condition M4.1 of EPL 20850. More frequent monitoring may be conducted at a subset of sites (e.g. those in close proximity to operations). Monitoring would be conducted in accordance with AS 1055:1997 *Acoustics – Description and Measurement of Environmental Noise and the INP*.

In accordance with Condition 3, Schedule 5 of Development Consent DA 92/97, the results of the attended monitoring will be compared with the noise criteria (Section 6).

Monitoring reports will be made publicly available on the MACH Energy website in accordance with Condition 11, Schedule 5 of Development Consent DA 92/97. A summary of all monitoring results for each year will be reported in the MPO Annual Review at the end of that year, in accordance with Condition 3, Schedule 5 of Development Consent DA 92/97.

Timing

In accordance with EPL 20850, attended noise monitoring will be undertaken in each quarter for a minimum of:

- 90 minutes during the day (i.e. 7.00 am to 6.00 pm);
- 30 minutes during the evening (i.e. 6.00 pm to 10.00 pm); and
- 60 minutes during the night (i.e. 10.00 pm to 7.00 am);

for three consecutive operating days.

Measurement

Measurement will be undertaken by a suitably experienced and capable person.

Acoustic instrumentation used in attended monitoring will comply with AS 1259.2:1990 Sound Level Meters and carry current National Association of Testing Authorities or manufacturer calibration certificates. Instrument calibration will be conducted before and after each survey, with the variation in calibrated levels not to exceed ± 0.5 dB(A).

Wind direction, wind speed, air temperature and relative humidity will all be recorded as part of the attended noise monitoring. Notes will be taken if there are changes in wind speed/direction at the various monitoring locations or if other relevant changes occur. While this information is gathered, the site data (wind speed/direction) will be included in compliance reports as this is taken at the required 10 m above ground level.

In accordance with EPL requirements, $L_{Aeq(15 \text{ minute})}$ noise monitoring for compliance purposes at a specific residence will be undertaken approximately on the property boundary (where any dwelling is situated 30 m or less from the property boundary closest the premises), or within 30 m of the dwelling (where the dwelling is more than 30 m from the boundary, if previously agreed with the landowner). However, if monitoring is being undertaken at a representative location for a general NAG, this requirement will not apply.

Comprehensive field notes will be taken to indicate mine sources (haul truck, dozer tracks, etc.) and other sources (birds, insects, dogs, passing cars, etc.) and when they occurred during the measurement to the nearest second. The recorded time-trace (at one second intervals) and wavefile will be analysed to quantify the noise contribution from each source. Notes about maximum mine noise levels (source and times) will also be taken. Where practicable, the data would be recorded using a sound level meter or noise logger with the capability to record time-traces and wavefiles.

The intrusive noise level contribution from MPO activities will be quantified over a 15 minute measurement period. In addition, measurements will be made in both A-weighting and C-weighting. Only parameters relevant to noise criteria will be reported.

Modifying factors from Section 4 of the INP will be used where applicable. Tonality and low frequency will be assessed by analysis of the measured L_{Aeq} spectrum³. Analysis should be conducted on a spectrum representative of potential MPO noise. The use of smaller sampling periods may be necessary to assess the applicability of modifying factors.

Details of corrective actions taken to address any noise criteria exceedances, and confirmation of their successful implementation, will be recorded by MACH Energy.

Recording

The following information will be recorded for each monitoring survey:

- operator's name;
- time and date;
- locations of attended or unattended noise instruments;
- recording intervals;
- meteorological conditions for each measurement location (as collected by a hand held meter) and also a combination of graphs and tables presenting the weather conditions for the entire survey period;
- statistical noise level descriptors together with notes identifying the principal noise sources;
- notes of recorded mine-related noise sources, including approximate start and finishing times;
- project operating conditions including train loading times together with mobile and ancillary equipment operation and predominant location; and
- instrument calibration details.

9.2.4 Applicable Meteorological Conditions

As described in Section 8.5, the noise limits set out in Development Consent DA 92/97 and in EPL 20850 do not apply under the following meteorological conditions:

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

Notwithstanding the above, weather conditions will be monitored (Section 9.4) and, where adverse conditions are experienced or predicted, operational changes will be implemented to avoid or reduce noise impacts.

A.3 MOUNT PLEASANT ENVIRONMENTAL PROTECTION LICENCE (20850)

L2 Noise limits

L2.1 Noise generated at the premises must not exceed the noise limits presented in the table below.

Note:

The noise limits in the table below do not apply if the licensee has a written agreement with the relevant landowner to exceed the noise limit and the licensee has advised the EPA in writing of the terms of the agreement.

The noise limits in the table below do not apply to residences owned by the licensee or those residences that are subject to acquisition as Listed in Table 1 of the Development Consent DA 92/97 (MOD1) dated 19 September 2011.

Location	Day - LAeq(15 minute)	Evening - LAeq(15 minute)	Night - LAeq(15 minute)	Night - LA1(1 minute)
NAG 1 - assessment locations 260 and 261	37	37	37	45
NAG 1 - assessment location 258	40	40	40	45
NAG 1 - assessment location 259	39	39	39	45
NAG 1 - All other privately-owned land	35	35	35	45
NAG 2 - assessment location 272	36	36	36	45
NAG 2 - All other privately-owned land	35	35	35	45
NAG 3 - assessment locations 139, 154 and 240	40	40	40	45
NAG 3 - assessment location 241	39	39	39	45

NAG 3 - All other privately-owned land	35	35	35	45
NAG 4 - assessment location 169	36	36	36	45
NAG 4 - All other privately-owned land	35	35	35	45
NAG 5 - All privately-owned land	41	40	39	45
NAG 6 - assessment location 205	41	41	41	45
NAG 6 - assessment locations 203 and 242	40	40	40	45
NAG 6 - assessment location 202	39	39	39	45
NAG 6 - assessment location 204	38	38	38	45
NAG 6 - All other privately-owned land	37	37	37	45
NAG 7 - assessment locations 68, 74 and 279	43	42	42	45
NAG 7 - assessment locations 86 and 290	42	42	42	45
NAG 7 - assessment location 77	42	41	41	45
NAG 7 - assessment locations 79, 80 and 231	41	41	41	45
NAG 7 - assessment location 78	41	40	40	45
NAG 7 - All other privately-owned land	40	37	37	45
NAG 8 - assessment location 35	42	41	41	45
NAG 8 - assessment location 289	41	40	40	45

NAG 8 - assessment locations 23 and 84	40	40	40	45
NAG 8 - All other privately-owned land	41	39	39	45
NAG 9 - All other privately-owned land	39	38	37	45
NAG 10 - All other privately-owned land	35	35	35	45
NAG 11 - All other privately-owned land	37	36	35	45
All other privately-owned land	35	35	35	45

L2.2 For the purpose of this licence the following definitions apply.

NAG is to be read as 'Noise Assessment Group'.

The locations of the Noise Assessment Groups are defined in Appendix 6 of the Determination of Development Application for the Mount Pleasant Coal Mine DA92/97, as modified on 19 September 2011.

Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.

Evening is defined as the period from 6pm to 10pm.

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

L2.3 The noise limits set out in this licence apply under all meteorological conditions except for the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- 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.

For the purposes of this condition:

- i) Data recorded by the meteorological station within the licensed premises must be used to determine meteorological conditions; and
- ii) 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.

L2.4 **Determining Compliance**

To determine compliance:

- a) with the LAeq(15 minute) noise limits in this licence, the noise measurement equipment must be located:
 - i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
 - ii) within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
 - iii) within approximately 50 metres of the boundary of a National Park or a Nature Reserve.
- b) with the LA1(1 minute) noise limits in this licence, the noise measurement equipment must be located within 1 metre of a dwelling façade.
- c) with the noise limits in this licence, 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.

- L2.5 Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy
- L2.6 A non-compliance with the noise limits specified in this licence 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 L2.4; or
 - ii) at a point other than the most affected point at a location.
- L2.7 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.

M9 Noise monitoring

- M9.1 To assess compliance with the noise limits specified in condition L2.1, the licensee must undertake attended noise monitoring in accordance with condition L2.4 and the following requirements:
 - a) be undertaken during a period that is representative of typical operating conditions and not undertaken during a shutdown period;
 - b) be undertaken at each one of the locations or at a location representative of the most-affected locations listed in condition L2.1;
 - c) be undertaken monthly in a reporting period; and
 - d) be undertaken for a minimum duration of 15 minutes within an assessment period.

Note: Night time noise monitoring is not required to be undertaken until night operations commence at the premises.

APPENDIX

B CALIBRATION CERTIFICATES




**Acoustic
Research
Labs Pty Ltd**

Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter IEC 61672-3:2013 Calibration Certificate

Calibration Number C18363

Client Details Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322	
Equipment Tested/ Model Number : Rion NA-28 Instrument Serial Number : 01070590 Microphone Serial Number : 08184 Pre-amplifier Serial Number : 52329	
Pre-Test Atmospheric Conditions Ambient Temperature : 21.3°C Relative Humidity : 41.7% Barometric Pressure : 100.95kPa	Post-Test Atmospheric Conditions Ambient Temperature : 22.7°C Relative Humidity : 39.2% Barometric Pressure : 100.89kPa
Calibration Technician : Lucky Jaiswal Calibration Date : 25 Jun 2018	Secondary Check: Lewis Boorman Report Issue Date : 25 Jun 2018
Approved Signatory :  Juan Agüero	
Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	Pass
13: Electrical Sig. tests of frequency weightings	Pass
14: Frequency and time weightings at 1 kHz	Pass
15: Long Term Stability	Pass
16: Level linearity on the reference level range	Pass
17: Level linearity incl. the level range control	Pass
18: Toneburst response	Pass
19: C Weighted Peak Sound Level	Pass
20: Overload Indication	Pass
21: High Level Stability	Pass

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Least Uncertainties of Measurement			
Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz	±0.12dB	Temperature	±0.05°C
12.5kHz	±0.18dB	Relative Humidity	±0.16%
16kHz	±0.31dB	Barometric Pressure	±0.017kPa
Electrical Tests			
31.5 Hz to 20 kHz	±0.12dB		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2



This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172
Accredited for compliance with ISO/IEC 17025 - calibration

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

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1



**Acoustic
Research
Labs Pty Ltd**

Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Calibrator
IEC 60942-2004

Calibration Certificate

Calibration Number C17149

Client Details Global Acoustics Pty Ltd
12/16 Huntingdale Drive
Thornton NSW 2322

Equipment Tested/ Model Number : Pulsar 106
Instrument Serial Number : 79631

Atmospheric Conditions
Ambient Temperature : 21.9°C
Relative Humidity : 54.6%
Barometric Pressure : 98.84kPa

Calibration Technician : Vicky Jaiswal
Calibration Date : 30/03/2017

Secondary Check: Riley Cooper
Report Issue Date : 31/03/2017

Approved Signatory :

Juan Agüero

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
5.2.2: Generated Sound Pressure Level	Pass	5.3.2: Frequency Generated	Pass
5.2.3: Short Term Fluctuation	Pass	5.5: Total Distortion	Pass

	Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
Measured Output	94.0	1000.0	94.1	1000.38

The sound calibrator has been shown to conform to the class 2 requirements for periodic testing, described in Annex B of IEC 60942 2004 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

Least Uncertainties of Measurement -			
Specific Tests		Environmental Conditions	
Generated SPL	±0.11dB	Temperature	±0.05°C
Short Term Fluct.	±0.02dB	Relative Humidity	±0.46%
Frequency	±0.01%	Barometric Pressure	±0.017kPa
Distortion	±0.5%		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.



This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025.

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

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1