RODNEY STEVENS ACOUSTICS
Acoustic Consultants
Member Australian Acoustical Society

Dog Kennel Facility

251 Rhodes Road, Young

Noise Impact Assessment

REPORT R200704R1

Revision 0

Prepared for:

Lucy Hammond

25 Rhodes Road

YOUNG NSW 2594

15 December 2020

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Dog Kennel Facility

251 Rhodes Road, Young

Noise Impact Assessment

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
R200704R1	Revision 0	15 December 2020	Dani Awad	Desmond Raymond	Rodney Stevens

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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (RSA) has been engaged by Lucy Hammond to assess the potential noise impact associated with the operation of dog kennel facility located at 251 Rhodes Road, Young.

This report presents the results of a prediction of the potential noise levels received at nearby potentially sensitive residences due to the operation of the kennel and an assessment of the impact of these emissions in relation to recognised criteria for environmental noise.

If necessary, recommendations are made for control measures to effectively ameliorate excessive noise emissions and enable the premises to operate without adverse impact upon the existing acoustical environment of the area.

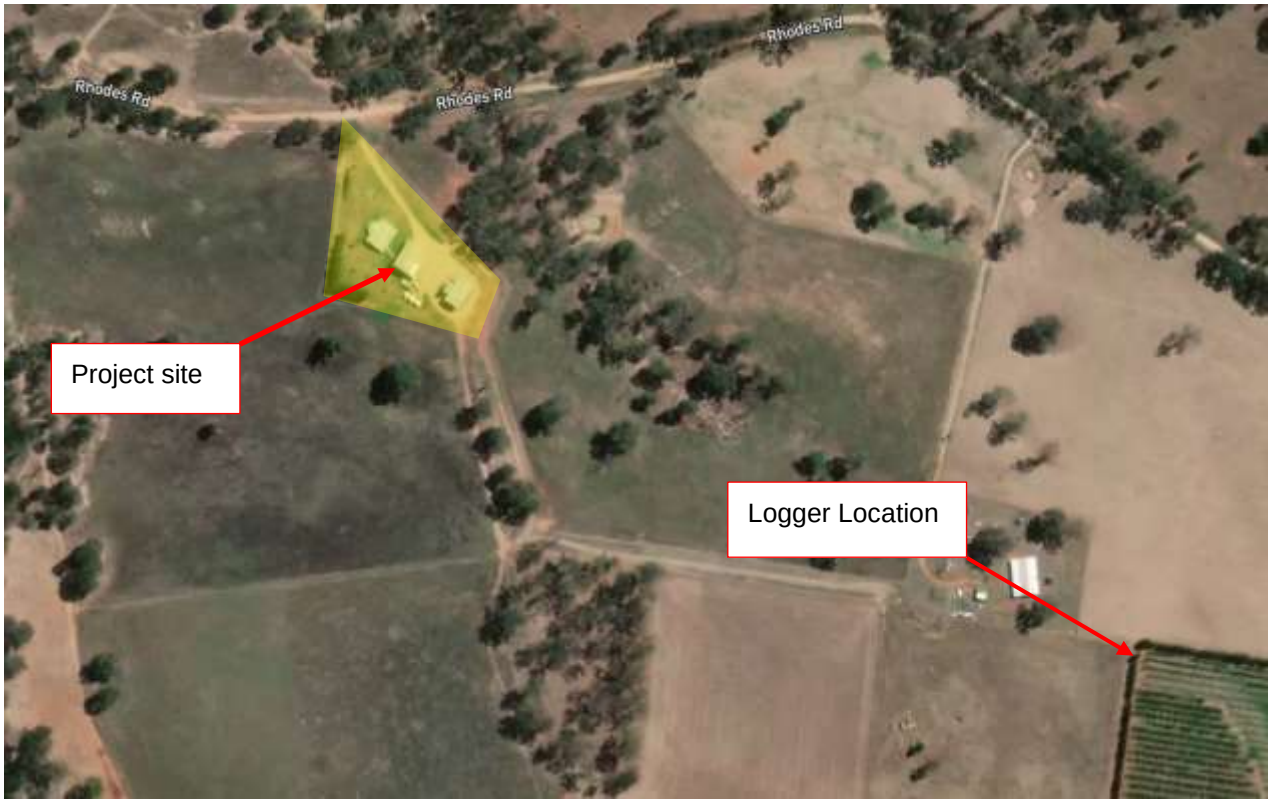
This report forms part of the submission to Council and has been carried out in accordance with the requirements of the NSW Environment Protection Authority (EPA) and other relevant criteria.

Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in Appendix A.

2 PROJECT OVERVIEW

The site is located at 251 Rhodes Road, Young. The project area and surrounding environment are shown in Figure 2-1. The site will house a maximum number of 24 Border collie mix dogs.

Figure 2-1 Project Area and Surrounding Environment

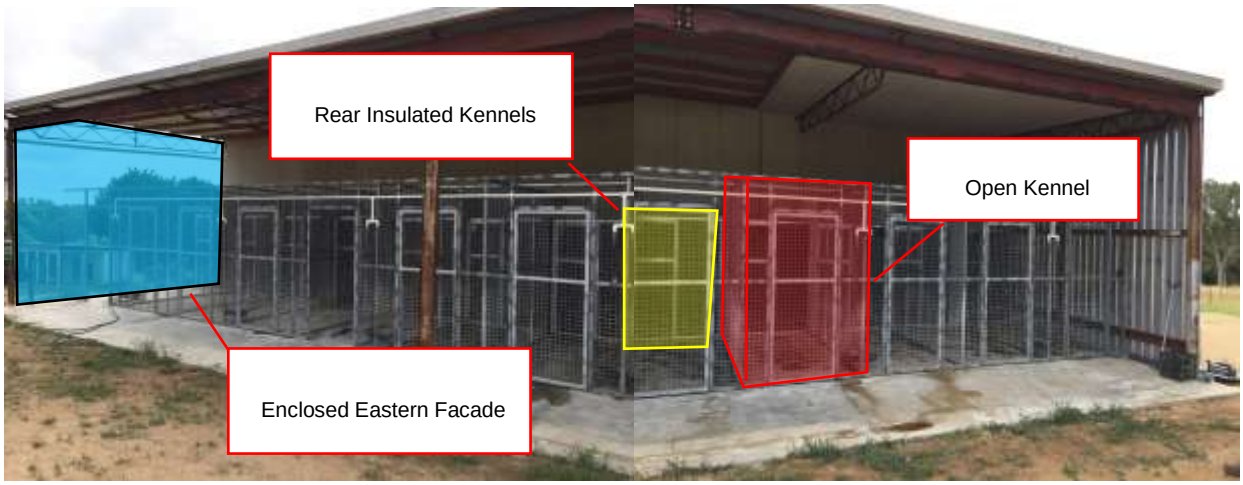


Aerial image courtesy of © 2020 Metro map

The existing kennel and site plan are shown in Figure 2-2 to Figure 2-3.

Figure 2-2 Site Layout

Figure 2-3 Existing Kennels



3 EXISTING NOISE ENVIRONMENT

3.1 Surrounding Environment

The surrounding environment consists principally of rural properties. The acoustical environment is generally controlled by noise emissions from low level vehicular movements associated with traffic on Rhodes Road, bird and insect noise and other activities associated with the properties in the area.

The nearest potentially sensitive residential receiver locations in relation to noise emissions from the proposed development are more than 400 meters away.

3.2 Ambient Noise Survey

In order to quantify the existing ambient noise environment of the area, noise monitoring was conducted near the proposed development site. This location was selected after a detailed inspection of the project area considering other noise sources that may influence the readings, the proximity of noise-sensitive receivers, security issues for the noise monitoring device and gaining permission for access from the residents or landowners. Unattended environmental noise monitoring was conducted between 24th November 2020 and 1st January 2020.

Instrumentation for the survey comprised a Rion NL 42 Environmental Noise Logger (Serial Number 133010) fitted with microphone and windshield. Calibration of the logger 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.

The measured data was processed according to the NSW EPA's *Noise Policy for Industry* (NPfI) assessment time periods. The processed noise monitoring results (based upon noise levels recorded during the weekday daytime period) are presented in Table 3-1.

Any data which has been affected by inclement weather has been removed from the assessment data.

Table 3-1 Measured Ambient Noise Levels Corresponding to NSW NPfI Assessment Time Periods

Logger Location	Noise Level – dBA re 20 µPa					
	Daytime 7.00 am – 6.00 pm		Evening 6.00 pm – 10.00 pm		Night-time 10.00 pm – 7.00 am	
	RBL [1]	LAeq [2]	RBL	LAeq	RBL	LAeq
South East Boundary	40	51	28	46	25	41

Note 1: The RBL noise level is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
Note 2: The LAeq is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

4 ASSESSMENT CRITERIA

4.1 Operational Noise Criteria

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the EPA. The EPA oversees the Noise Policy for Industry (NPfI) October 2017 which provides a framework and process for deriving noise criteria. The NPfI criteria for industrial noise sources have two (2) components:

Controlling the intrusive noise impacts for residents and other sensitive receivers in the short term; and

Maintaining noise level amenity for particular land uses for residents and sensitive receivers in other land uses.

4.1.1 Intrusiveness Criterion

For assessing intrusiveness, the background noise generally needs to be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (LAeq) of the source should not be more than 5 dB(A) above the measured Rated Background Level (RBL), over any 15-minute period.

4.1.2 Amenity Criterion

The amenity criterion is based on land use and associated activities (and their sensitivity to noise emission). The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. The criteria relate only to other industrial-type noise sources and do not include road, rail or community noise. The existing noise level from industry is measured.

If it approaches the criterion value, then noise levels from new industrial-type noise sources, (including air-conditioning mechanical plant) need to be designed so that the cumulative effect does not produce total noise levels that would significantly exceed the criterion.

4.1.3 Area Classification

The NPfI characterises the “Rural” noise environment as an area with an acoustical environment that:

- is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels.
- Settlement patterns would be typically sparse

The area surrounding the proposed development falls under the “Rural” area classification.

4.2 Project Specific Noise Levels

Having defined the area type, the processed results of the unattended noise monitoring have been used to determine project specific noise criteria. The intrusive and amenity criteria for nearby residential premises are presented in Table 4-1.

These criteria are nominated for the purpose of assessing potential noise impacts from the proposed development.

In this case, the ambient noise environment is not controlled by industrial noise sources and therefore the project amenity noise levels are assigned as per Table 2.2 of the NPfI (Recommended Amenity Noise Levels). For each assessment period, the lower (i.e. the more stringent) of the amenity or intrusive criteria are adopted.

These are shown in bold text in Table 4-1.

Table 4-1 Operational Project Trigger Noise Levels

Receiver	Time of Day	ANL [1] $L_{Aeq(15min)}$	Measured		Criteria for New Sources	
			RBL [2] $L_{A90(15min)}$	L_{Aeq} Noise Level)	Intrusive $L_{Aeq(15min)}$	Amenity $L_{Aeq(15min)}$
Residential	Day	50	40	51	45[3]	53
	Evening	45	28	46	35[3]	48
	Night	40	25	41	35[3]	43

Note 1: ANL = "Amenity Noise Level" for residences in Rural Areas.
Note 2: RBL = "Rating Background Level".
Note 3: Where background noise level is below 30 dB(A), the RBL is assumed to be 30 dB(A) as per the minimum background requirements of NPfI

In summary, the project specific noise level for the assessment of (continuous $L_{Aeq(15minute)}$) operational noise emissions between 7:00 am and 6:00 pm, based upon the procedures documented within the NSW NPfI, is **45 dBA**. The project specific noise level for the assessment of (continuous $L_{Aeq(15minute)}$) operational noise emissions between 6:00 pm and 10:00 pm, based upon the procedures documented within the NSW NPfI, is **35 dBA**. The project specific noise level for the assessment of (continuous $L_{Aeq(15minute)}$) operational noise emissions between 10:00 pm and 7:00 am, based upon the procedures documented within the NSW NPfI, is **35 dBA**.

4.3 Sleep Disturbance Criteria

The potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.

Noise Policy for Industry provides the following guidelines on the project trigger noise levels:

Where the subject development/premises night-time noise levels at a residential location exceed:

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

For planning purposes, the assumed level of background noise for the night-time period is taken to be the night-time Rating Background Level, as given in Table 4-1 resulting in a sleep disturbance criterion of:

- $L_{Aeq(15min)}$ 40 dBA (as per NPfI minimum requirements)
- L_{AFmax} 52 dBA (as per NPfI minimum requirements)

5 NOISE ASSESSMENT

5.1 Mechanical Plant Noise Assessment

No additional mechanical plant is proposed for the site. If in the future any substantial mechanical plant is added it must achieve the noise criteria of 35 dB(A) at the nearest property boundary.

5.2 Predicted Animal Noise Impact

Rodney Stevens Acoustics has conducted noise measurement of dogs barking in the existing open kennel area. The purpose of the attended noise measurements was to obtain the sound pressure levels of a set number of dogs. The measurements were conducted approximately 1m from the dogs as the animals were barking in the open kennel area over a 30 second period.

The measurements were conducted on 24th November 2020 between 1:30pm and 2:30pm. Instrumentation for the survey comprised of a NTI XL-2 Type I Sound Level Meter (serial number A2A-11435-E0.) fitted with microphone windshields. Calibration of the logger was checked prior to and following measurements. Drift in calibration did not exceed ±0.5 dB(A). All equipment carried appropriate and current NATA (or manufacturer) calibration certificates. Weather conditions during measurement period is considered 'normal' which is without rain and no wind.

The sound pressure levels of barking dogs are presented in Table 5-1.

Table 5-1 Measured Sound Pressure Level of Dogs

		Octave Frequency Band Sound Pressure Level (dB)							
Animal Type	**Measured Overall dB(A)**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
2 dogs barking at the same time at 1m ($L_{Aeq(30sec)}$)	87	61	71	58	75	79	71	55	47

Based on the sound pressure levels presented above, we have calculated the average sound power level of a single dog by averaging the levels in Table 5-1 and subtracting $10*\log_{10}(2)$.

Table 5-2 Calculated Sound Power Levels

		Octave Band Frequency Sound Power Levels(dB)							
Animal Type	**Measured Overall dB(A)**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
1 dog - L_w	88	43	63	57	80	87	80	64	54

The 'Measured Overall dB(A)' presented in Table 5-1 and Table 5-2, is extracted from the SLM as part of the attended noise survey.

5.3 Predicted Accumulative Noise Impact from Kennel

Noise level predictions for animal noise at the site have been predicted by utilising NSW EPA recognised and approved computer noise model SoundPlan 8.2 software. SoundPlan is a fully integrating software suite that specialises in computer simulations of noise situations incorporating over 50 calculation standards. The model calculates overall noise levels at receiver locations considering distance, atmospheric absorption, barriers effects of intervening ground types, source levels, source and receiver locations and topography.

The following figure presents the proposed development and all sensitive receivers.

Figure 5-1 Sensitive Receiver Location

The following conditions are assumed:

- Maximum 24 dogs in the existing open kennel area at one time between 7am - 7pm
- Maximum 2 dogs being taken for their day time exercise lap around the confines of the site between 9am - 12pm.
- All dogs will be in their insulated kennels from 10pm - 7am.
- We have assumed that dogs may bark for up to 5 minutes before being tended to. As advised by the operators of the kennel, the dogs are taken inside as soon as they start barking. The 'barkers' are generally known by the operators and they can manage the barkers to ensure a quieter operation.
- Dog noise source considered to be 1 meter tall.
- No dogs in the outdoor exercise areas during the evening and night time.

Predictive resultant noise impact based on the operation of the proposed development has been calculated for animal noise emissions at neighbouring receivers are presented in Table 5-3

Table 5-3 Noise Assessment at Nearby Sensitive Receivers

Receiver	Time Period	Resultant Noise Impact dB(A)	Criteria	Compliance
R1 Lot 3 Rhodes Road	Daytime	28 dB(A)	38 dB(A) (NPfI)	Yes
	Evening	28 dB(A)	35 dB(A) (NPfI)	
	Night Time	28 dB(A)	35 dB(A) (NPfI)	
	Sleep Disturbance	28 dB(A)	52 dB(A) (SD)	
R2 216 Rhodes Road	Daytime	34 dB(A)	38 dB(A) (NPfI)	Yes
	Evening	34 dB(A)	35 dB(A) (NPfI)	
	Night Time	34 dB(A)	35 dB(A) (NPfI)	
	Sleep Disturbance	34 dB(A)	52 dB(A) (SD)	
R3 177 Rhodes Road	Daytime	33 dB(A)	38 dB(A) (NPfI)	Yes
	Evening	33 dB(A)	35 dB(A) (NPfI)	
	Night Time	33 dB(A)	35 dB(A) (NPfI)	
	Sleep Disturbance	33 dB(A)	52 dB(A) (SD)	

Based on the predicted noise levels it is expected that operational noise from the proposed development will comply with the criteria of all of the sensitive receivers even when under the assumption of the worst-case operational conditions.

6 RECOMMENDATIONS

In order to maintain acoustic amenity to nearby sensitive receivers, the following noise control measures are recommended to be incorporated.

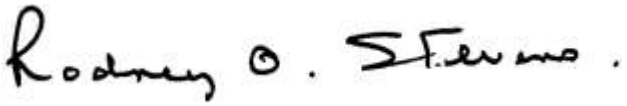
- Rubber perimeter seals must be installed on the doors of the insulated kennels so that no gaps can be found when the doors are closed.
- The western facade of the kennel structure must be enclosed to match the eastern façade (Please see Figure 2-3 . Construction of the facade must be solid and gapless.

7 CONCLUSION

Rodney Stevens Acoustics has conducted an acoustic assessment for the dog kennel facility located at 251 Rhodes Road, Young NSW. The assessment has included the establishment of noise criteria and a comparison of predicted noise levels with regard to regulatory criteria.

Noise emissions associated with the development to the surrounding nearest residential receivers have been calculated with the noise criteria as established in accordance with the *Noise Policy for Industry*. It has been demonstrated that the development will not have an adverse impact on the nearest residential receivers based on the proposed worst case operations.

Approved: -



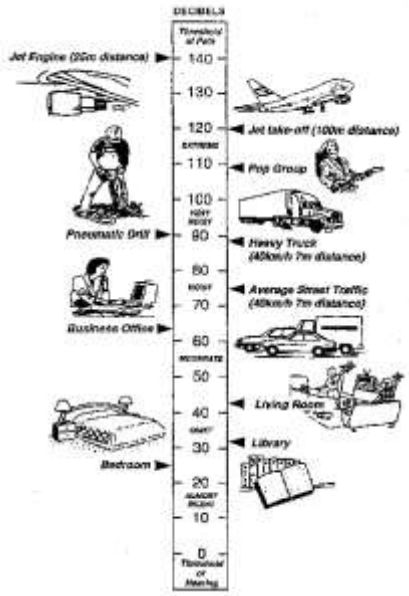
Rodney Stevens - MAAS

Appendix A – Acoustic Terminology

A-weighted sound pressure	The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1 to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic '*A-weighting*' frequency filter is applied to the measured sound level *dB(A)* to account for these sensitivities. Other frequency weightings (B, C and D) are less commonly used. Sound measured without a filter is denoted as linear weighted dB(linear).
Ambient noise	The total noise in a given situation, inclusive of all noise source contributions in the near and far field.
Community annoyance	Includes noise annoyance due to: ▪ character of the noise (e.g. sound pressure level, tonality, impulsiveness, low-frequency content) ▪ character of the environment (e.g. very quiet suburban, suburban, urban, near industry) ▪ miscellaneous circumstances (e.g. noise avoidance possibilities, cognitive noise, unpleasant associations) ▪ human activity being interrupted (e.g. sleep, communicating, reading, working, listening to radio/TV, recreation).
Compliance	The process of checking that source noise levels meet with the noise limits in a statutory context.
Cumulative noise level	The total level of noise from all sources.
Extraneous noise	Noise resulting from activities that are not typical to the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Feasible and reasonable measures	Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, considering the following factors: ▪ Noise mitigation benefits (amount of noise reduction provided, number of people protected). ▪ Cost of mitigation (cost of mitigation versus benefit provided). ▪ Community views (aesthetic impacts and community wishes).

- Noise levels for affected land uses (existing and future levels, and changes in noise levels).

Impulsiveness	Impulsive noise is noise with a high peak of short duration or a sequence of these peaks. Impulsive noise is also considered annoying.
Low frequency	Noise containing major components in the low-frequency range (20 to 250 Hz) of the frequency spectrum.
Noise criteria	The general set of non-mandatory noise levels for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity (e.g. noise levels for various land use).
Noise level (goal)	A noise level that should be adopted for planning purposes as the highest acceptable noise level for the specific area, land use and time of day.
Noise limits	Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels, which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.
Performance-based goals	Goals specified in terms of the outcomes/performance to be achieved, but not in terms of the means of achieving them.
Rating Background Level (RBL)	The rating background level is the overall single figure background level representing each day, evening and night time period. The rating background level is the 10^{th} percentile min L_{A90} noise level measured over all day, evening and night time monitoring periods.
Receptor	The noise-sensitive land use at which noise from a development can be heard.
Sleep disturbance	Awakenings and disturbance of sleep stages.
Sound and decibels (dB)	Sound (or noise) is caused by minute changes in atmospheric pressure that are detected by the human ear. The ratio between the quietest noise audible and that which should cause permanent hearing damage is a million times the change in sound pressure. To simplify this range the sound pressures are logarithmically converted to decibels from a reference level of 2 x 10-5 Pa. The picture below indicates typical noise levels from common noise sources.



dB is the abbreviation for decibel – a unit of sound measurement. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

Sound Power Level (SWL)

The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in *dB(A)*.

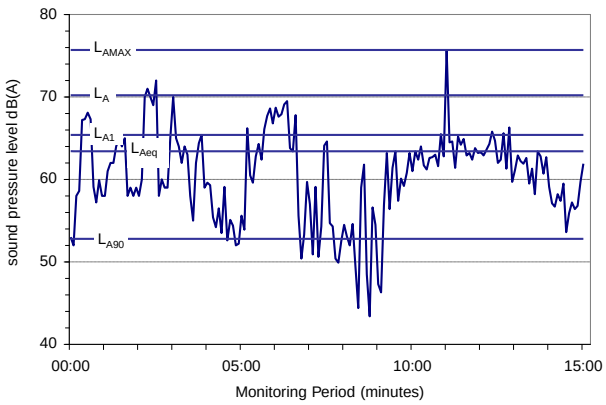
Sound Pressure Level (SPL)

The level of noise, usually expressed as SPL in *dB(A)*, as measured by a standard sound level meter with a pressure microphone. The sound pressure level in *dB(A)* gives a close indication of the subjective loudness of the noise.

Statistical noise levels

Noise levels varying over time (e.g. community noise, traffic noise, construction noise) are described in terms of the statistical exceedance level.

A hypothetical example of A weighted noise levels over a 15-minute measurement period is indicated in the following figure:



Key descriptor

- LAmax Maximum recorded noise level.

- L_{A1} The noise level exceeded for 1% of the 15 minute interval.
- L_{A10} Noise level present for 10% of the 15-minute interval. Commonly referred to the average maximum noise level.
- L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.
- L_{A90} Noise level exceeded for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

Threshold	The lowest sound pressure level that produces a detectable response (in an instrument/person).
Tonality	Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dBA penalty is typically applied to noise sources with tonal characteristics.

Appendix B – Calibration Certificates

Acoustic Research Labs Pty Ltd
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North Rocks NSW AUSTRALIA 2151
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 C19389

Client Details	Rodney Stevens Acoustics Pty Ltd 1 Majura Close St Ives Chase NSW 2075
Equipment Tested/ Model Number :	Rion NL-42EX
Instrument Serial Number :	00133010
Microphone Serial Number :	144601
Pre-amplifier Serial Number :	23060

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	25°C	**Ambient Temperature :**	24.8°C
Relative Humidity :	41.7%	**Relative Humidity :**	41.5%
Barometric Pressure :	100.8kPa	**Barometric Pressure :**	100.8kPa

Calibration Technician : Lucky Jaiswal
Secondary Check: Eloise Burrows
Calibration Date : 2 Jul 2019
Report Issue Date : 8 Jul 2019
Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz:	*±0.15dB*	*Temperature*	*±0.2°C*
12.5kHz:	*±0.2dB*	*Relative Humidity*	*±2.4%*
16kHz:	*±0.29dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests			
31.5 Hz to 20 kHz:	*±0.11dB*		

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.

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Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C20435

Client Details	Rodney Stevens Acoustics Pty Ltd 1 Majura Close St Ives Chase NSW 2075
Equipment Tested/ Model Number :	NTI XL2-TA
Instrument Serial Number :	A2A-11435-E0
Microphone Serial Number :	9283
Pre-amplifier Serial Number :	5786

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	24.6°C	**Ambient Temperature :**	24.5°C
Relative Humidity :	38.9%	**Relative Humidity :**	39.1%
Barometric Pressure :	100.37kPa	**Barometric Pressure :**	100.38kPa

Calibration Technician : Jeff Yu
Calibration Date : 3 Aug 2020
Secondary Check: Max Moore
Report Issue Date : 6 Aug 2020
Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*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	
125Hz	*±0.13dB*	*Temperature*	*±0.2°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±2.4%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests	*±0.10dB*		

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 SI units.

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.

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Octave Band Filter
IEC 61260-3:2016
Calibration Certificate

Calibration Number C20435A

Client Details	Rodney Stevens Acoustics Pty Ltd 1 Majura Close St Ives Chase NSW 2075
Filter Model Number :	NTI XL2-TA
Filter Serial Number :	N/A
Instrument Serial Number :	A2A-11435-E0
Microphone Serial Number :	9283
Pre-amplifier Serial Number :	5786

Atmospheric Conditions

Ambient Temperature :	24.3°C
Relative Humidity :	41%
Barometric Pressure :	100.5kPa

Calibration Technician :	Jeff Yu	**Secondary Check:**	Max Moore
Calibration Date :	03 Aug 2020	**Report Issue Date :**	06 Aug 2020

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
Midband Relative Attenuation (Clause 10)	**Pass**	Operating Range Lower Limit (Clause 12)	**Pass**
Linearity, Range and Overload (Clause 11)	**Pass**	Relative Attenuation (Clause 13)	**Pass**

The filter submitted for testing successfully completed the periodic tests of IEC 61260-3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61260-2, to demonstrate that the model of filter fully conformed to the class 1 specifications in IEC 61260-1:2014 the filter submitted for testing conforms to the class 1 specifications of IEC 61260-1:2014.

Least Uncertainties of Measurement -

Electrical Tests

5dB < ΔA(Σ) < -5dB	*±0.1dB*
40dB < ΔA(Σ) < 5dB	*±0.2dB*
ΔA(Σ) < 40dB	*±0.3dB*

Environmental Conditions

Temperature	*±0.2°C*
Relative Humidity	*±2.4%*
Barometric Pressure	*±0.015kPa*

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 SI units.

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.

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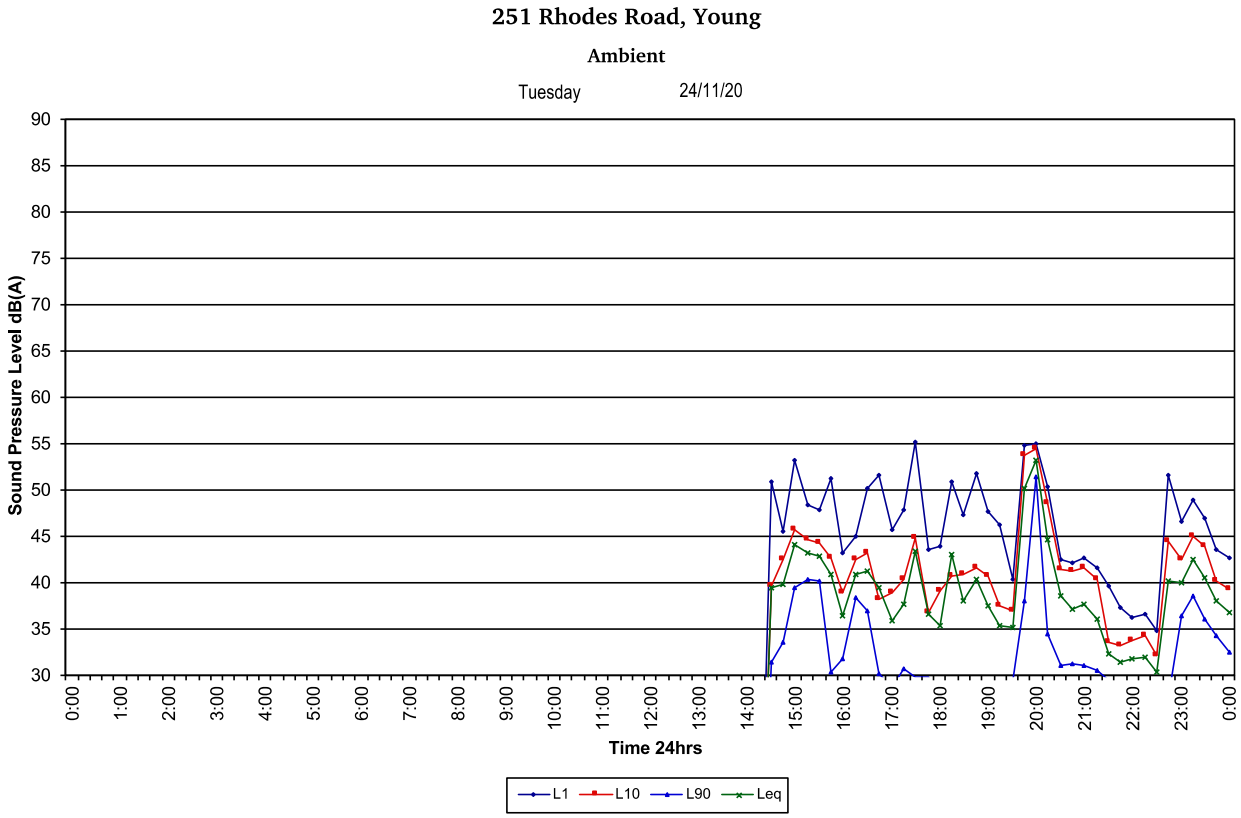
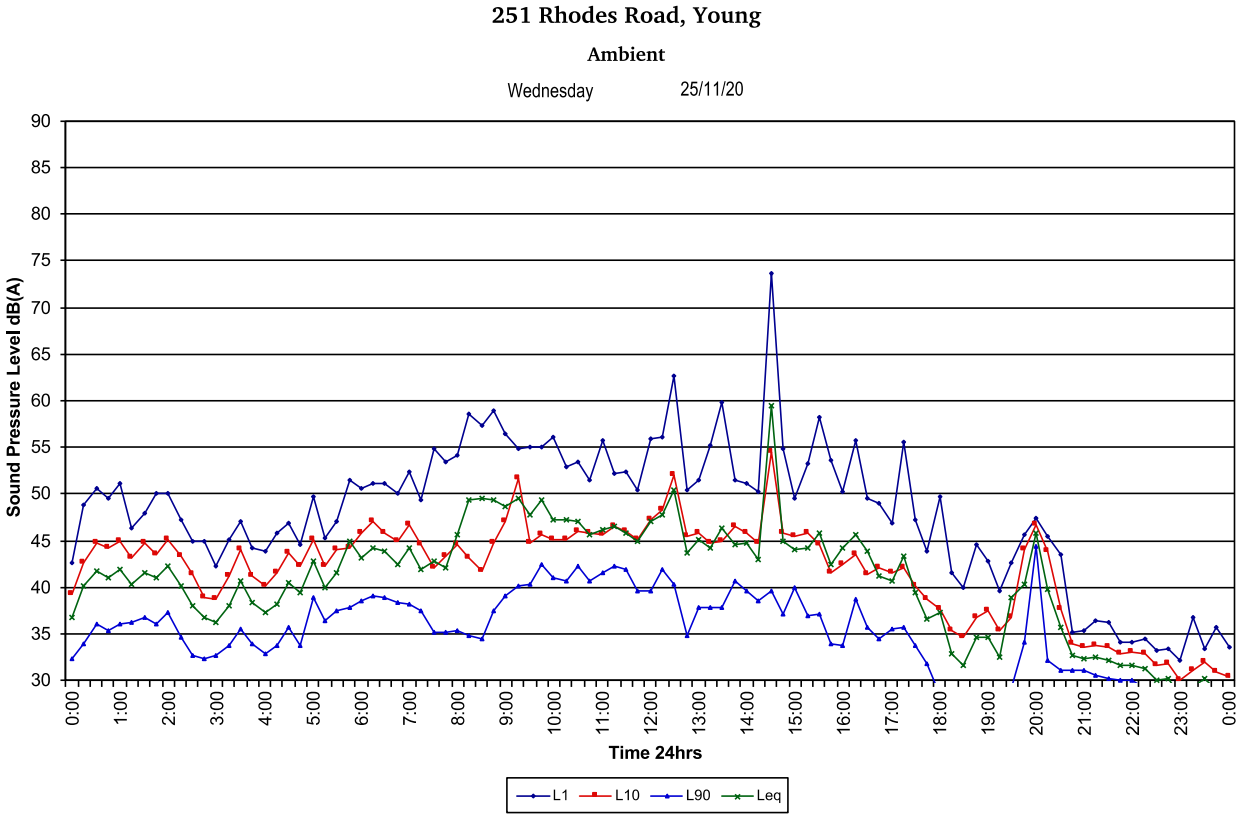
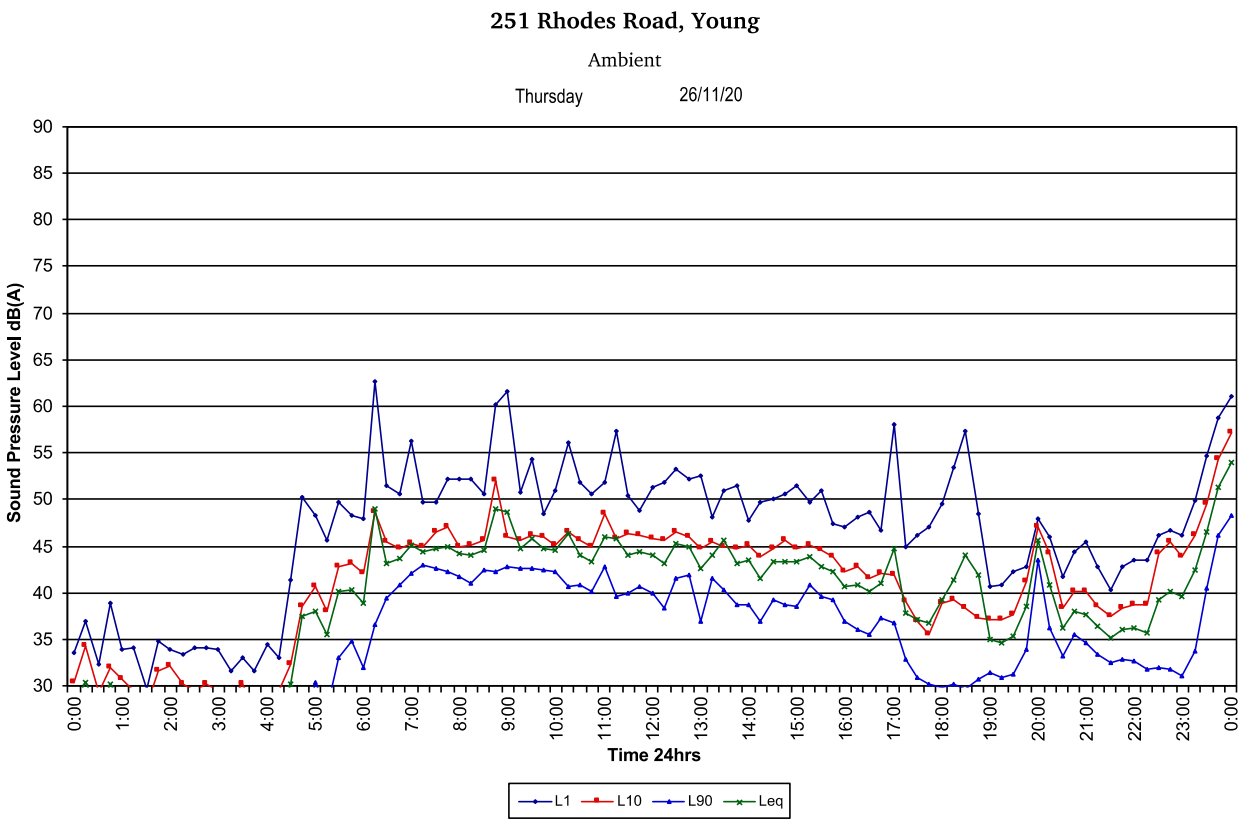
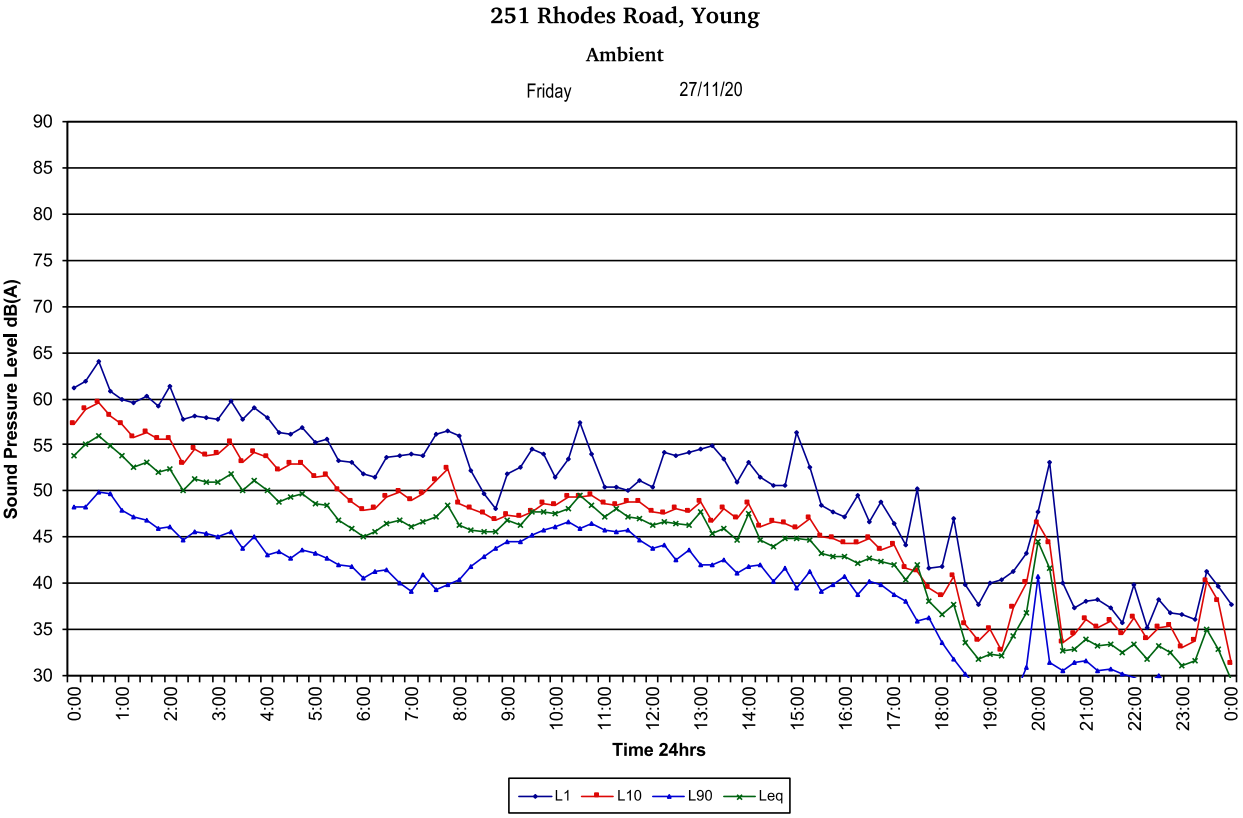
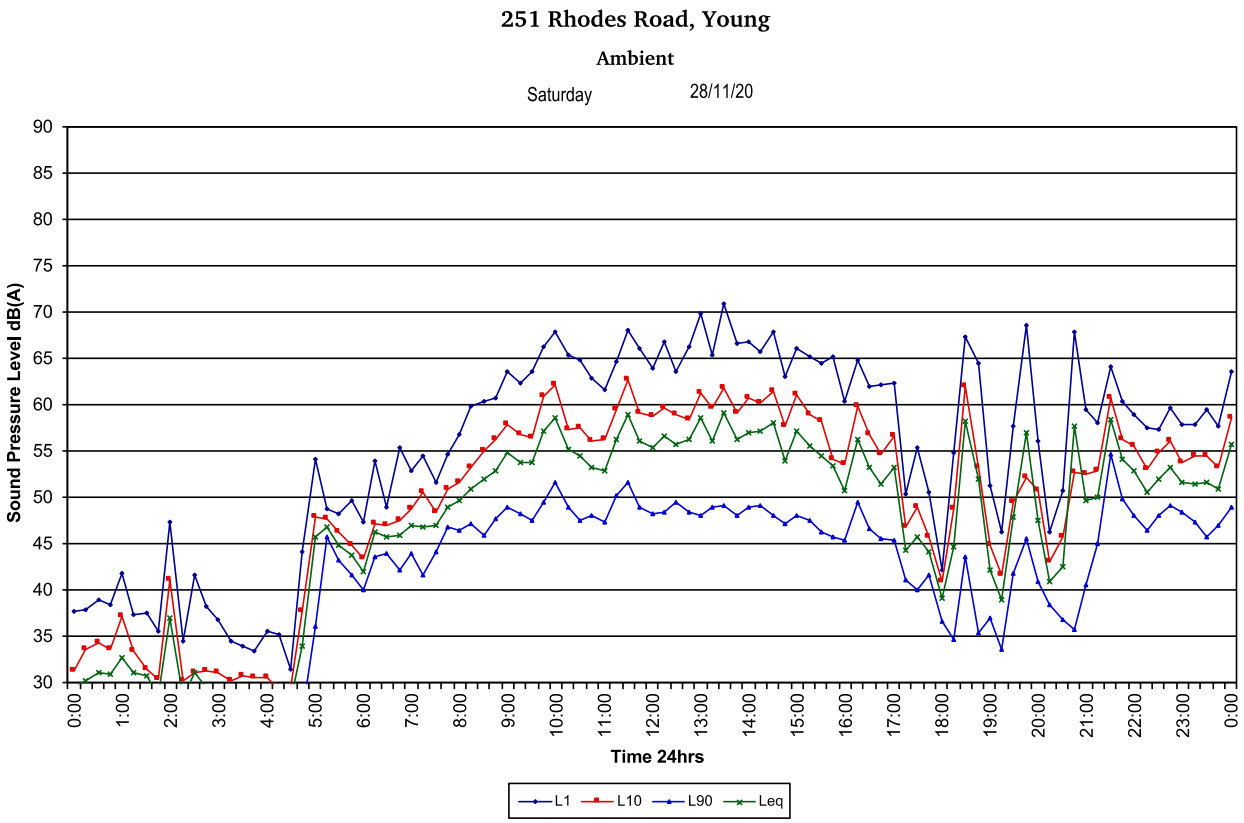
Appendix C – Unattended Noise Monitoring

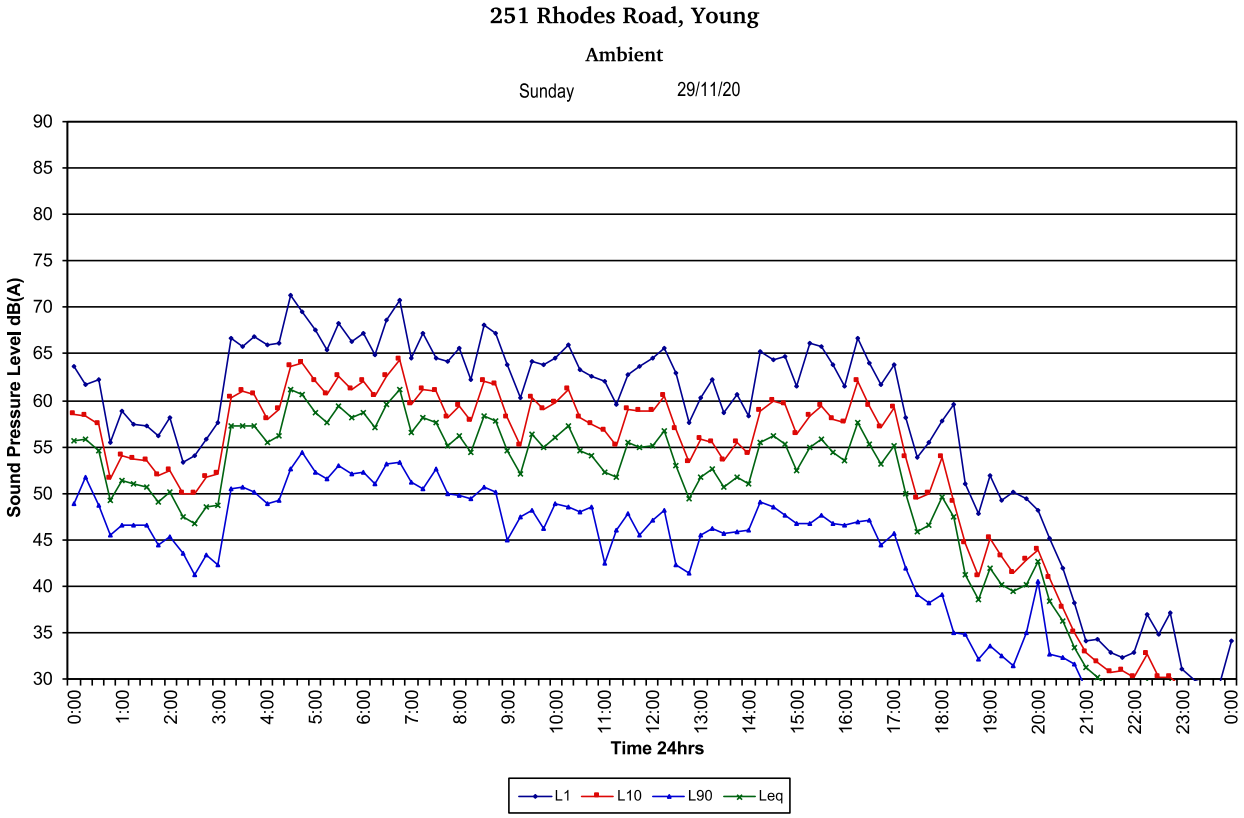


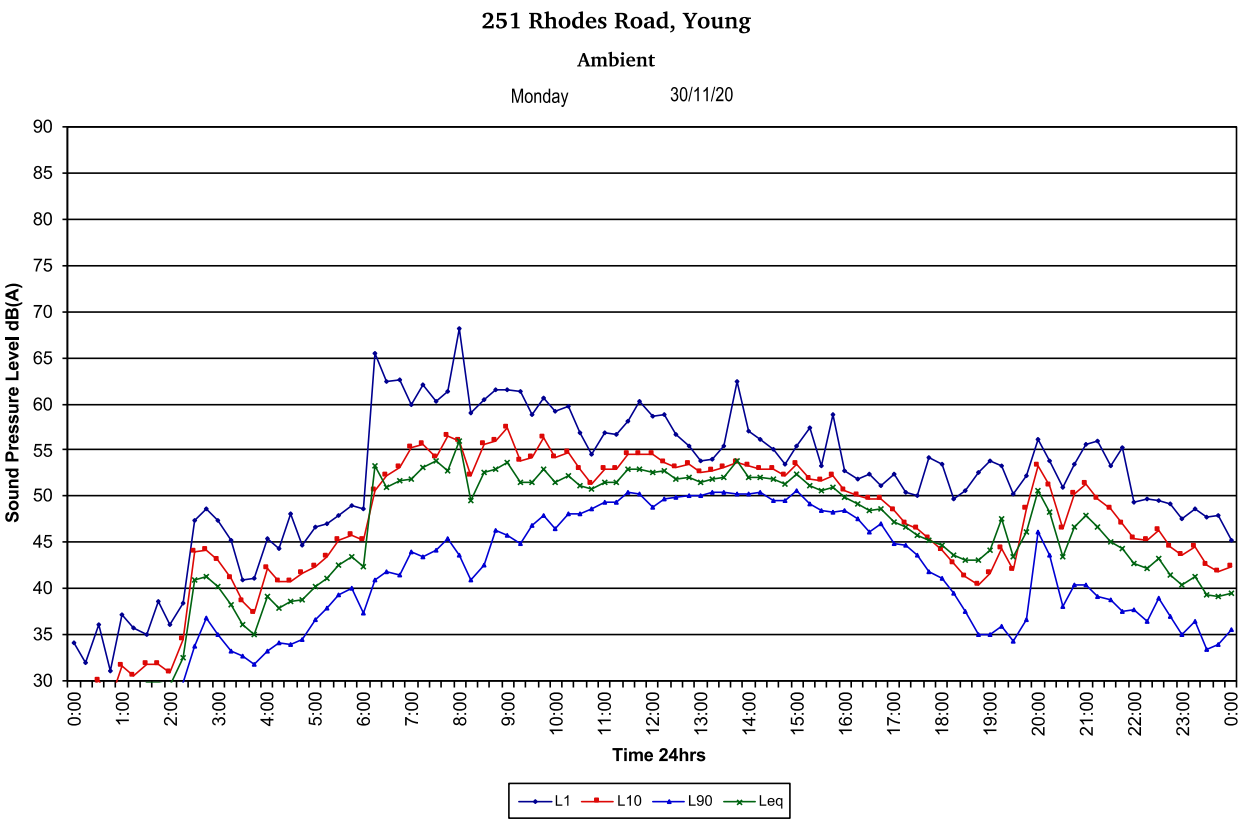


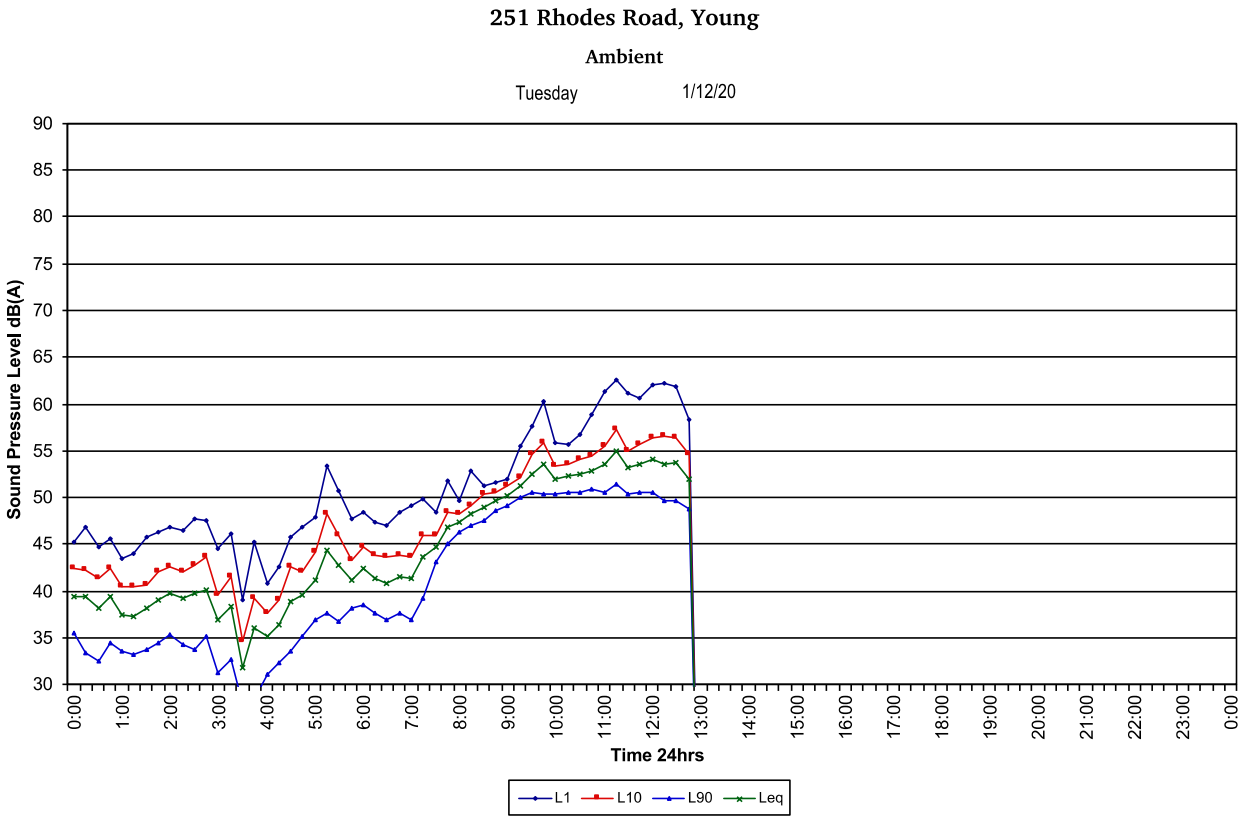

251 Rhodes Road, Young
Ambient
Thursday 26/11/20
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


251 Rhodes Road, Young
Ambient
Friday 27/11/20
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


251 Rhodes Road, Young
Ambient
Saturday 28/11/20
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


251 Rhodes Road, Young
Ambient
Sunday 29/11/20
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


251 Rhodes Road, Young
Ambient
Monday 30/11/20
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


251 Rhodes Road, Young
Ambient
Tuesday 1/12/20
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq