

CALGA SAND QUARRY

ANNUAL COMPLIANCE NOISE MONITORING

REPORT NO. 01127-AM
VERSION A

JUNE 2019

PREPARED FOR

HANSON CONSTRUCTION MATERIALS PTY LTD
LOT 151 PEATS RIDGE ROAD
CALGA NSW 2250

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
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AAAC

This firm is a member firm of the Association of Australasian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.



Celebrating 50 Years in 2012

Wilkinson Murray is an independent firm established in 1962, originally as Carr & Wilkinson. In 1976 Barry Murray joined founding partner Roger Wilkinson and the firm adopted the name which remains today. From a successful operation in Australia, Wilkinson Murray expanded its reach into Asia by opening a Hong Kong office early in 2006. Today, with offices in Sydney, Newcastle, Wollongong, Orange, Queensland and Hong Kong, Wilkinson Murray services the entire Asia-Pacific region.



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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

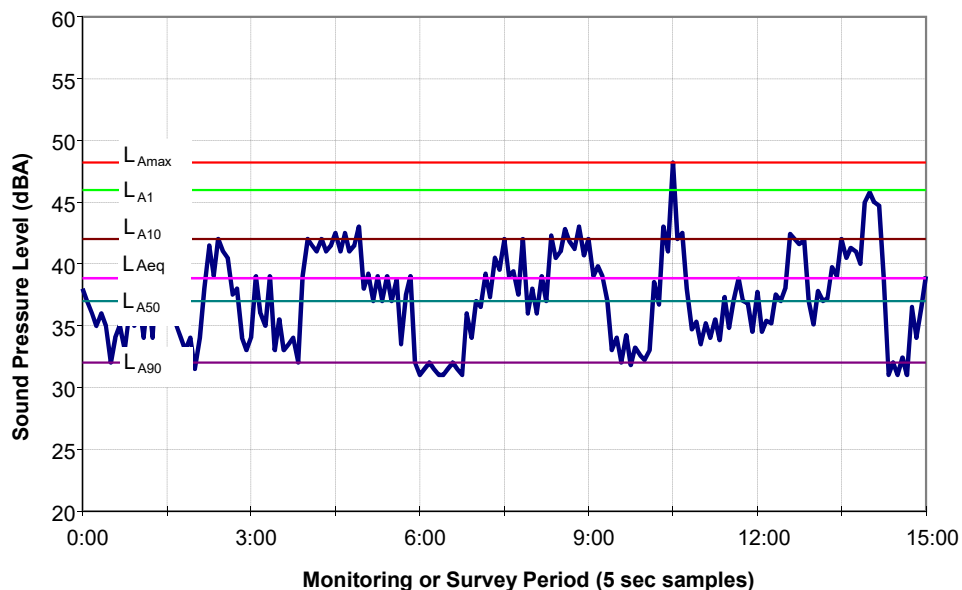
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

Noise monitoring of the Calga Sand Quarry (the Site) was carried out by Wilkinson Murray (WM) in order to assess compliance with the relevant noise limits set by the Environment Protection Authority's (EPA) *Environment Protection Licence* (Licence No. 11295).

The compliance assessment is based on noise monitoring conducted on Monday 29 April, Tuesday 30 April, and Wednesday 1 May 2019.

Noise monitoring was undertaken in accordance with the *NSW Industrial Noise Policy (INP)* which is relevant to the Project's *Environment Protection Licence (EPL)*.

2 ENVIRONMENTAL PROTECTION LICENCE

EPL Conditions relevant to noise limits (L3) and noise monitoring (M7) are reproduced below. Figure 3 of the Noise Management Plan is also included to show the identified noise-sensitive receivers referred to in the *EPL*.

L3 Noise limits

- L3.1 Noise from premises must not exceed the following limits at the locations and times specified. Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels over a measurement period.

Location	Noise Limit ($L_{Aeq,15minute}$)	Noise Limit ($L_{Aeq,15minute}$)	Noise Limit ($L_{Aeq,15minute}$)	Noise Limit ($L_{A1,1minute}$)
(As shown on Figure 4.5 of the EIS for the Calga Sand Quarry Extension dated May 2004)	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Night (10pm - 7am)
Residence 3	41	35	35	45
Residence 4	40	35	35	45
Residence 5	39	35	35	45
Residence 8	36	35	35	45
Any other residence not subject to a negotiated agreement	35	35	35	45

- L3.2 The noise emission limits identified in this licence apply under all meteorological conditions except for:
- wind speeds greater than 3 metres/second at 10 metres above ground level; or
 - temperature inversion conditions between 1.5 degrees Celsius and 3 degrees Celsius per 100 metres and wind speed up to 2 metres per second at 10 metres above ground level; or
 - temperature inversion conditions greater than 3 degrees Celsius per 100 metres.

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

- a) Data recorded by the meteorological station identified as EPA Licence Point 2 must be used to determine meteorological conditions; and
- b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW *Industrial Noise Policy*.

L3.4 To determine compliance:

- a) with the $L_{eq(15\text{minute})}$ noise limits in condition L3.1, the noise measurement equipment must be located:
 - approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
 - within 30 metres of a dwelling facade, but not closer than 3 metres, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
 - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.
- b) with the $L_{1(1\text{min})}$ noise limits in condition L3.1, the noise measurement equipment must be located within 1 metre of a dwelling facade.
- c) with the noise limits in condition L3.1, the noise measurements equipment must be located:
 - at the most affected point at a location where there is no dwelling at the location; or
 - at the most affected point within an area at a location prescribed by condition L3.4(a) or L3.4(b).

L3.5 A non-compliance of condition L3.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- a) at a location other than an area prescribed by condition L3.3(a) and L3.3(b); and/or
- b) at a point other than the most affected point at a location.

L3.6 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW *Industrial Noise Policy* must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

M7 Noise monitoring

M7.1 To assess compliance with the noise limits presented in the noise monitoring table in condition L3.1, attended noise monitoring must be undertaken in accordance with condition L3.4 and:

- a) at each one of the locations listed in Condition L3.1;
- b) occur annually in a reporting period;
- c) occur during each day, evening and night period as defined in the NSW *Industrial Noise Policy* for a minimum of:
 - i) 1.5 hours during the day;
 - ii) 30 minutes during the evening; and
 - iii) 1 hour during the night.
- d) occur for three consecutive operating days.

Note: The frequency of monitoring may be varied by the EPA once the variability of the noise impact is established.

Figure 2-1 Land Ownership and Surrounding Receivers

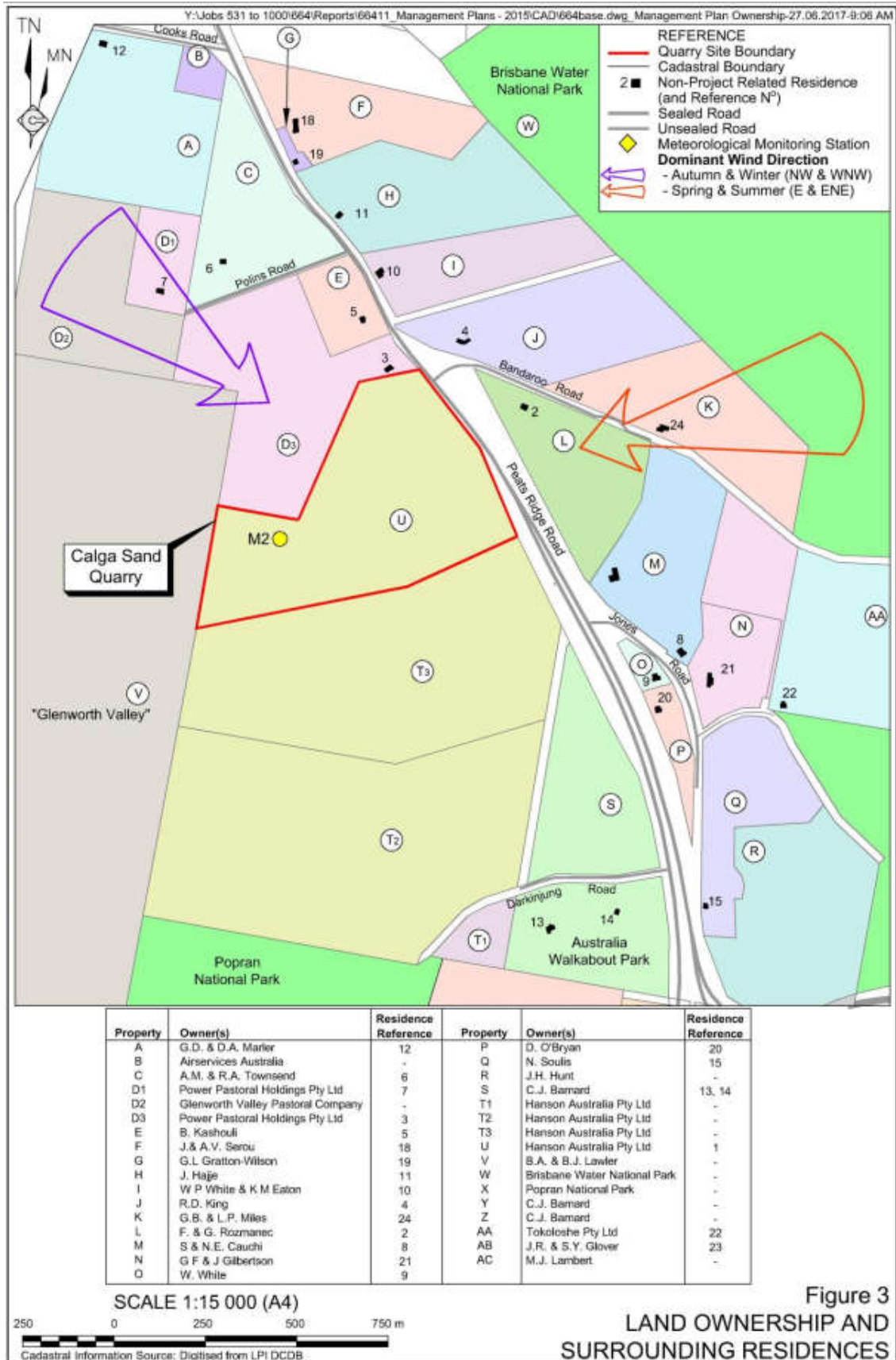


Figure 3
LAND OWNERSHIP AND
SURROUNDING RESIDENCES

3 MONITORING METHODOLOGY

3.1 Monitoring Locations

Monitoring was conducted at Residences 3, 4, 8 and 13. Note that Residence 5 was not included in the noise monitoring. It is assumed that achieving compliance at Residence 3 would infer compliance at Residence 5.

For Residence 3, daytime monitoring was conducted inside the property approximately 30 meters (m) west of the dwelling. Evening and night measurements were carried out along Peats Ridge Road adjacent to the property, approximately 20 m away from the dwelling.

Monitoring at Residence 4 was conducted 30 m away from the dwelling on the property's access road.

For Residence 8, noise monitoring was conducted on Jones Road adjacent to the property. Due to the location of the residence relative to the quarry, site-related noise levels at the monitoring location are expected to be representative of those at the residence.

Monitoring at R13 were carried out on Darkinjung Road at the entrance gate to Australia Walkabout Wildlife Park.

3.2 Monitoring Periods

Monitoring was conducted across three consecutive days on Monday 29 April, Tuesday 30 April, and Wednesday 1 May 2019.

Daytime measurements were typically conducted between the hours of 11.30am and 6.00pm. Evening monitoring was completed directly after the daytime measurements, between approximately 6.00pm and 8.00pm.

Night time monitoring was undertaken between the hours of 5.00am and 7.00am as no activities occur on site between 10.00pm and 5.00am. In order to complete the night time measurements in three consecutive nights, two WM representatives conducted measurements simultaneously at different locations. It should be noted that due to the limited time available to conduct the night time monitoring (i.e. between 5.00am and 7.00am) and the time required to move from one monitoring location to the next, night time measurements finished just after 7.00am.

3.3 Monitoring Equipment

Noise levels were measured with Bruel & Kjaer Type 2236 Sound Level Meters. This Sound Level Meter conforms to Australian Standard 1259 "Acoustics – Sound Level Meters" as a Type 1 Precision Sound Level Meter which has an accuracy suitable for laboratory use. The A-Weighting filter of the meter was selected and the time weighting was set to 'fast'. The meters were field calibrated both before and after the measurements with Bruel & Kjaer Sound Level Calibrators Type 4230. No significant system drift was noted (both sound level meters calibrated 94.0 dBA before and after each of the 15-minute measurements).

The B&K 2236s and the B&K 4230s have been laboratory calibrated within the previous two years in accordance with Wilkinson Murray Quality Assurance procedures. Calibration Certificates for both Sound Level Meters used for the monitoring are attached to this letter. Note that Calibration Certificates are valid for 2 years.

3.4 Meteorological Conditions

The measurements were conducted in suitable meteorological conditions for valid measurements (wind less than 5 meters per second at microphone height and no rain). Wind speed was determined by the WM representatives using a hand-held digital anemometer AR816.

Meteorological data was also obtained from the Site's weather station to determine the applicability of the *EPL* noise limits under the meteorological conditions present during the measurements. The data is summarised in Appendix B. It demonstrates that monitoring was typically conducted during meteorological conditions under which the *EPL* noise limits apply.

It should be noted that the Site's weather station does not capture sigma-theta and as such temperature inversions during the measurements could not be determined. With respect to the *EPL* Conditions, the presence of temperature inversions is of no consequence in the event of compliance (i.e. noise levels increase in the presence of temperature inversions).

4 MEASUREMENT RESULTS

Table 4-1 summarises the measured $L_{Aeq,15min}$ and $L_{A1,1min}$ noise levels generated by the Site. Individual noise levels measured at the same locations were collated into ranges of noise levels for ease of reference. Detailed results of all measurements are summarised in Appendix C.

Table 4-1 Summary of Measured Noise Levels

Monitoring Period	Location	Day 1 (29/4/19)		Day 2 (30/4/19)		Day 3 (1/5/19)		Noise Limits	
		$L_{Aeq,15min}$ due to Site Noise (dBA)	$L_{A1,1min}$ due to Site Noise (dBA)	$L_{Aeq,15min}$ due to Site Noise (dBA)	$L_{A1,1min}$ due to Site Noise (dBA)	$L_{Aeq,15min}$ due to Site Noise (dBA)	$L_{A1,1min}$ due to Site Noise (dBA)	$L_{Aeq,15min}$ (dBA)	$L_{A1,1min}$ (dBA)
Day (7.00am – 6.00pm)	Res. 3	39-41	n/a	31-40	n/a	32-41	n/a	41	n/a
	Res. 4	35-36	n/a	31	n/a	31	n/a	40	n/a
	Res. 8	Inaudible	n/a	Inaudible	n/a	Inaudible	n/a	36	n/a
	Res. 13	Inaudible	n/a	Inaudible	n/a	Inaudible	n/a	35	n/a
Evening (6.00pm – 10.00pm)	Res. 3	Inaudible	n/a	Inaudible	n/a	Inaudible	n/a	35	n/a
	Res. 4	27-28	n/a	Inaudible	n/a	28	n/a	35	n/a
	Res. 8	Inaudible	n/a	Inaudible	n/a	Inaudible	n/a	35	n/a
	Res. 13	Inaudible	n/a	Inaudible	n/a	Inaudible	n/a	35	n/a
Night	Res. 3	26-28	41	27-28	41-42	25-30	41-42	35	45

Monitoring Period	Location	Day 1 (29/4/19)		Day 2 (30/4/19)		Day 3 (1/5/19)		Noise Limits	
		L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} (dBA)	L _{A1,1min} (dBA)
(10.00pm – 7am)	Res. 4	26-27	43-45	25-28	42-43	23-25	43-44	35	45
	Res. 8	Inaudible	Inaudible	Inaudible	Inaudible	Inaudible	Inaudible	35	45
	Res. 13	Inaudible	Inaudible	Inaudible	Inaudible	Inaudible	Inaudible	35	45

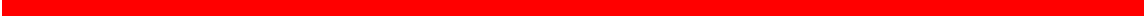
Table 4-1 indicates that measured L_{Aeq,15min} and L_{A1,1min} noise levels generated by the Site complied with the relevant noise limits set in the *EPL*.

5 CONCLUSION

Noise monitoring of the Calga Sand Quarry was carried out by Wilkinson Murray in order to assess compliance with the relevant noise limits set by the Environment Protection Authority's *Environment Protection Licence* (Licence No. 11295).

The compliance assessment is based on noise monitoring conducted on Monday 29 April, Tuesday 30 April, and Wednesday 1 May 2019.

Monitoring results indicate that measured L_{Aeq,15min} and L_{A1,1min} noise levels generated by the Site complied with the relevant noise limits set in the *EPL*.



APPENDIX A
SOUND LEVEL METERS - CALIBRATION CERTIFICATES





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Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
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Sound Level Meter
AS 1259.1:1990 - AS 1259.2:1990
Calibration Certificate

Calibration Number C18659

Client Details Wilkinson Murray Pty Ltd
Level 4, 272 Pacific Highway
Crows Nest NSW 2065

Equipment Tested/ Model Number : B&K 2236
Instrument Serial Number : 1856450
Microphone Serial Number : 1868172
Pre-amplifier Serial Number : N/A

Atmospheric Conditions
Ambient Temperature : 21.9°C
Relative Humidity : 55.1%
Barometric Pressure : 99.41kPa

Calibration Technician : Lucky Jaiswal
Calibration Date : 19 Dec 2018
Secondary Check: Lewis Boorman
Report Issue Date : 19 Dec 2018

Approved Signatory :  Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
10.2.2: Absolute sensitivity	Pass	10.3.4: Inherent system noise level	Pass
10.2.3: Frequency weighting	Pass	10.4.2: Time weighting characteristic F and S	Pass
10.3.2: Overload indications	Pass	10.4.3: Time weighting characteristic I	Pass
10.3.3: Accuracy of level range control	Pass	10.4.5: R.M.S performance	Pass
8.9: Detector-indicator linearity	Pass	9.3.2: Time averaging	Pass
8.10: Differential level linearity	Pass	9.3.5: Overload indication	Pass

Least Uncertainties of Measurement - Environmental Conditions			
Acoustic Tests		Temperature	±0.2°C
31.5 Hz to 8kHz	±0.15dB	Relative Humidity	±2.4%
12.5kHz	±0.21dB	Barometric Pressure	±0.015Pa
16kHz	±0.29dB		
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.

The sound level meter under test has been shown to conform to the type 1 requirements for periodic testing as described in AS 1259.1:1990 and AS 1259.2:1990 for the tests stated above.



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.



**Acoustic
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Sound Level Meter
IEC 61672-3.2013

Calibration Certificate

Calibration Number C17521

Client Details Wilkinson Murray Pty Ltd
Level 4, 272 Pacific Highway
CROWS NEST NSW 2065

Equipment Tested/ Model Number : B&K 2236
Instrument Serial Number : 2030550
Microphone Serial Number : 1903087
Pre-amplifier Serial Number : ZC0027

Pre-Test Atmospheric Conditions
Ambient Temperature : 22.8°C
Relative Humidity : 49.2%
Barometric Pressure : 99.43kPa

Post-Test Atmospheric Conditions
Ambient Temperature : 22.7°C
Relative Humidity : 45.6%
Barometric Pressure : 99.42kPa

Calibration Technician : Jason Gomes
Calibration Date : 09/10/2017

Secondary Check: Sandra Minto
Report Issue Date : 09/10/2017

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 61672-3:2006, 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 61672-1:2002 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 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Least Uncertainties of Measurement -			
Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz	±0.16dB	Temperature	±0.05°C
12.5kHz	±0.2dB	Relative Humidity	±0.46%
16kHz	±0.29dB	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.



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Accredited for compliance with ISO/IEC 17025.

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APPENDIX B
METEOROLOGICAL DATA FROM ON-SITE WEATHER STATION

Day	Assessment Period	Time Period	Wind Speed (m/s)	Wind Direction	Rain (mm)
Day 1 (29/4/19)	Night (10.00pm – 7.00am)	5.00am – 5.15am	0	-	0
		5.15am – 5.30am	0	-	0
		5.30am – 5.45am	0	-	0
		5.45am – 6.00am	0	-	0
		6.00am – 6.15am	0	-	0
		6.15am – 6.30am	0	-	0
		6.30am – 6.45am	0	-	0
	Day (7.00am – 6.00pm)	2.00pm – 2.15pm	3.6	ESE	0
		2.15pm – 2.30pm	2.7	ESE	0
		2.30pm – 2.45pm	2.2	E	0
		2.45pm – 3.00pm	2.2	E	0
		3.00pm – 3.15pm	2.7	ESE	0
		3.15pm – 3.30pm	2.2	E	0
		3.30pm – 3.45pm	2.7	ESE	0
		3.45pm – 4.00pm	3.1	ESE	0
		4.00pm – 4.15pm	2.7	ESE	0
		4.15pm – 4.30pm	2.2	ESE	0
		4.30pm – 4.45pm	2.2	E	0
		4.45pm – 5.00pm	1.8	E	0
		5.00pm – 5.15pm	0.9	E	0
	Evening (6.00pm – 10.00pm)	5.15pm – 5.30pm	0	-	0
		5.30pm – 5.45pm	0.4	E	0
		5.45pm – 6.00pm	0.4	E	0
		6.00pm – 6.15pm	0	E	0
		6.15pm – 6.30pm	0	-	0
		6.30pm – 6.45pm	0	-	0
		6.45pm – 7.00pm	0	-	0
		7.00pm – 7.15pm	0	-	0
		7.15pm – 7.30pm	0	-	0
		7.30pm – 7.45pm	0	-	0
Day 2 (30/4/19)	Night (10.00pm – 7.00am)	7.45pm – 8.00pm	0	-	0
		8.00pm – 8.15pm	0.4	E	0
		5.00am – 5.15am	0	-	0
		5.15am – 5.30am	0	-	0
		5.30am – 5.45am	0	-	0
		5.45am – 6.00am	0	-	0
		6.00am – 6.15am	0	-	0
		6.15am – 6.30am	0	-	0
		6.30am – 6.45am	0	-	0
		6.45pm – 7.00pm	0	-	0

Day	Assessment Period	Time Period	Wind Speed (m/s)	Wind Direction	Rain (mm)
		6.45am – 7.00am	0	-	0
		7.00am – 7.15am	0	-	0
		11.45am -12.00pm	3.6	ENE	0
		12.00pm – 12.15pm	3.1	NE	0
		12.15pm – 12.30pm	2.7	NE	0
		12.30pm – 12.45pm	2.7	NE	0
		12.45pm – 1.00pm	3.1	ENE	0
		1.00pm – 1.15pm	2.2	ENE	0
		1.15pm – 1.30pm	2.7	ENE	0
		1.30pm – 1.45pm	1.8	NE	0
		1.45pm – 2.00pm	2.2	ENE	0
		2.00pm – 2.15pm	2.2	ENE	0
		2.15pm – 2.30pm	1.8	NE	0
		2.30pm – 2.45pm	1.8	NNE	0
	Day (7.00am – 6.00pm)	2.45pm – 3.00pm	2.2	ENE	0
		3.00pm – 3.15pm	2.2	ENE	0
		3.15pm – 3.30pm	3.1	ENE	0
		3.30pm – 3.45pm	3.1	ENE	0
		3.45pm – 4.00pm	3.1	ENE	0
		4.00pm – 4.15pm	2.7	ENE	0
		4.15pm – 4.30pm	3.1	ENE	0
		4.30pm – 4.45pm	3.1	ENE	0
		4.45pm – 5.00pm	2.7	NE	0
		5.00pm – 5.15pm	1.8	NE	0
		5.15pm – 5.30pm	2.2	ENE	0
		5.30pm – 5.45pm	2.7	ENE	0
		5.45pm – 6.00pm	2.2	NE	0
		6.00pm – 6.15pm	2.2	NE	0
		6.15pm – 6.30pm	2.7	NE	0
		6.30pm – 6.45pm	3.1	NE	0
		6.45pm – 7.00pm	3.6	NE	0
	Evening (6.00pm – 10.00pm)	7.00pm – 7.15pm	2.7	NE	0
		7.15pm – 7.30pm	2.7	NE	0
		7.30pm – 7.45pm	3.1	NE	0
		7.45pm – 8.00pm	4	NE	0
		8.00pm – 8.15pm	4	NE	0
		8.15pm – 8.30pm	4.5	NE	0
Day 3	Night (10.00pm –	5.00am – 5.15am	0	-	0

Day	Assessment Period	Time Period	Wind Speed (m/s)	Wind Direction	Rain (mm)
(1/5/19)	7.00am)	5.15am – 5.30am	0	-	0
		5.30am – 5.45am	0	-	0
		5.45am – 6.00am	0	-	0
		6.00am – 6.15am	0	-	0
		6.15am – 6.30am	0.4	ENE	0
		6.30am – 6.45am	0	ENE	0
		6.45am – 7.00am	0	-	0
		7.00am – 7.15am	0	-	0
	Day (7.00am – 6.00pm)	11.30am – 11.45am	0	-	0
		11.45am -12.00pm	0.4	WSW	0
		12.00pm – 12.15pm	0.4	WSW	0
		12.15pm – 12.30pm	0.9	WNW	0
		12.30pm – 12.45pm	0.4	NW	0
		12.45pm – 1.00pm	0.9	N	0
		1.00pm – 1.15pm	0.9	NNE	0
		1.15pm – 1.30pm	1.3	N	0
		1.30pm – 1.45pm	0.9	NNW	0
		1.45pm – 2.00pm	1.3	NNW	0
		2.00pm – 2.15pm	0.4	NW	0
		2.15pm – 2.30pm	0.9	N	0
		2.30pm – 2.45pm	0.9	N	0
		2.45pm – 3.00pm	0	-	0
		3.00pm – 3.15pm	0	-	0
		3.15pm – 3.30pm	0	-	0
		3.30pm – 3.45pm	0	-	0
		3.45pm – 4.00pm	1.8	NE	0
		4.00pm – 4.15pm	1.8	ENE	0
		4.15pm – 4.30pm	2.7	ENE	0
		4.30pm – 4.45pm	3.1	ENE	0
		4.45pm – 5.00pm	2.2	ENE	0
		5.00pm – 5.15pm	2.2	NE	0
		5.15pm – 5.30pm	3.1	ENE	0
	5.30pm – 5.45pm	2.7	NE	0	
5.45pm – 6.00pm	0.9	NNE	0		
Evening (6.00pm – 10.00pm)	6.00pm – 6.15pm	2.2	NE	0	
	6.15pm – 6.30pm	4.5	ENE	0	
	6.30pm – 6.45pm	2.7	NE	0	
	6.45pm – 7.00pm	1.3	NNE	0	

Day	Assessment Period	Time Period	Wind Speed (m/s)	Wind Direction	Rain (mm)
		7.00pm – 7.15pm	2.2	NE	0
		7.15pm – 7.30pm	3.1	ENE	0
		7.30pm – 7.45pm	1.8	NNE	0
		7.45pm – 8.00pm	2.2	NE	0
		8.00pm – 8.15pm	1.8	NE	0

Note: No data is available for the period between 6.45am and 2.00pm on Monday, 29 April 2019 (Day 1) due to equipment malfunction.

APPENDIX C

DETAILED MEASUREMENT RESULTS

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
Day 1 (29/4/19)	Night (10.00pm – 7.00am)	5.00am - 5.15am	Residence 3	73	26	41	35	45	Truck movements associated with Site briefly audible 33-41 dBA. Peats Ridge Road traffic noise 80-92 dBA.
		5.15am - 5.30am	Residence 3	71	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-92 dBA.
		5.30am - 5.45am	Residence 3	73	26	41	35	45	Truck movements associated with Site briefly audible 33-41 dBA. Peats Ridge Road traffic noise 80-90 dBA.
		5.45am - 6.00am	Residence 3	73	28	41	35	45	Truck movements associated with Site briefly audible 33-41 dBA. Peats Ridge Road traffic noise 80-93 dBA.
		6.03am - 6.18am	Residence 4	57	27	44	35	45	Truck movements associated with Site briefly audible 41-44 dBA. Peats Ridge Road traffic noise 67-74 dBA.
		6.18am - 6.33am	Residence 4	59	27	44	35	45	Truck movements associated with Site briefly audible 41-44 dBA. Peats Ridge Road traffic noise 67-76 dBA.
		6.33am - 6.48am	Residence 4	57	26	43	35	45	Truck movements associated with Site briefly audible 41-43 dBA. Peats Ridge Road traffic noise 67-74 dBA.
		6.48am - 7.03am	Residence 4	58	27	45	35	45	Truck movements associated with Site briefly audible 41-45 dBA. Peats Ridge Road traffic noise 67-78 dBA.
		5.00am - 5.15am	Residence 13	51	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-49 dBA. Peats Ridge Road traffic noise 60-66 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		5.15am - 5.30am	Residence 13	51	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-49 dBA. Peats Ridge Road traffic noise 60-67 dBA.
		5.30am - 5.45am	Residence 13	52	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-49 dBA. Peats Ridge Road traffic noise 60-70 dBA. Birds 55-60 dBA.
		5.45am - 6.00am	Residence 13	53	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-50 dBA. Peats Ridge Road traffic noise 60-71 dBA. Birds 55-61 dBA.
		6.03am - 6.18am	Residence 8	55	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 60-63 dBA. Roosters 53-56 dBA.
		6.18am - 6.33am	Residence 8	58	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-41 dBA. Peats Ridge Road traffic noise 60-65 dBA. Jones Road traffic 70-81 dBA. Roosters 53-55 dBA.
		6.33am - 6.48am	Residence 8	56	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 60-65 dBA. Jones Road traffic 70-73 dBA. Roosters 53-55 dBA.
		6.48am - 7.03am	Residence 8	57	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 60-68 dBA. Jones Road traffic 70-79 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
Day (7.00am – 6.00pm)		11.29am - 11.44pm	Residence 8	57	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-67 dBA. Jones Road traffic 70-85 dBA. Dogs nearby 52-70 dBA.
		11.44am - 11.59am	Residence 8	52	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-66 dBA. Dogs nearby 60-73 dBA.
		11.59am - 12.14pm	Residence 8	55	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 60-67 dBA. Jones Road traffic 70-82 dBA.
		12.14pm – 12.29pm	Residence 8	53	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-69 dBA.
		12.29pm – 12.44pm	Residence 8	55	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-68 dBA. Jones Road traffic 70-76 dBA.
		12.44pm - 12.59pm	Residence 8	55	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-65 dBA. Jones Road traffic 70-80 dBA.
		1.05pm - 1.20pm	Residence 13	48	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Peats Ridge Road traffic noise 58-62 dBA. Birds 45-50dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		1.20pm - 1.35pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Peats Ridge Road traffic noise 58-60 dBA. Birds 45-53dBA.
		1.35pm – 1.50pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Peats Ridge Road traffic noise 58-61 dBA. Birds 45-51dBA.
		1.50pm – 2.05pm	Residence 13	48	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Peats Ridge Road traffic noise 58-60 dBA. Birds 45-50dBA.
		2.05pm – 2.20pm	Residence 13	50	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-47 dBA. Peats Ridge Road traffic noise 58-62 dBA. Birds 45-50dBA.
		2.20pm – 2.35pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Peats Ridge Road traffic noise 58-62 dBA. Birds 45-51dBA.
		2.42pm – 2.57pm	Residence 3	51	40	n/a	41	n/a	Site noise audible: typical engine noise 34-41 dBA and brief impact/articulation/scrapping noise 40-43dBA. Peats Ridge Road traffic noise 49-60 dBA.
		2.57pm – 3.12pm	Residence 3	51	40	n/a	41	n/a	Site noise audible: typical engine noise 34-41 dBA and brief impact/articulation/scrapping noise 40-43dBA. Peats Ridge Road traffic noise 49-63 dBA.
		3.12pm – 3.27pm	Residence 3	49	41	n/a	41	n/a	Site noise audible: typical engine noise 34-43 dBA and brief impact/articulation/scrapping noise 40-44dBA. Peats Ridge Road traffic noise 49-64 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		3.27pm – 3.42pm	Residence 3	49	40	n/a	41	n/a	Site noise audible: typical engine noise 34-41 dBA and brief impact/articulation/scraping noise 40-42dBA. Peats Ridge Road traffic noise 49-65 dBA.
		3.42pm – 3.57pm	Residence 3	51	41	n/a	41	n/a	Site noise audible: typical engine noise 34-42 dBA and brief impact/articulation/scraping noise 40-44dBA. Peats Ridge Road traffic noise 49-69 dBA.
		3.57pm – 4.12pm	Residence 3	52	39	n/a	41	n/a	Site noise audible: typical engine noise 34-40 dBA and brief impact/articulation/scraping noise 40-42dBA. Peats Ridge Road traffic noise 49-69 dBA.
		4.18pm – 4.33pm	Residence 4	53	36	n/a	40	n/a	Site noise barely audible: typical engine noise 34-35 dBA and brief impact/articulation/scraping noise 35-44dBA. Peats Ridge Road traffic noise 47-70 dBA.
		4.33pm – 4.48pm	Residence 4	52	36	n/a	40	n/a	Site noise barely audible: typical engine noise 34-36 dBA and brief impact/articulation/scraping noise 35-43dBA. Peats Ridge Road traffic noise 47-68 dBA.
		4.48pm – 5.03pm	Residence 4	55	35	n/a	40	n/a	Site noise barely audible: typical engine noise 34-35 dBA and brief impact/articulation/scraping noise 35-40dBA. Peats Ridge Road traffic noise 47-68 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		5.03pm – 5.18pm	Residence 4	54	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 47-70 dBA.
		5.18pm – 5.33pm	Residence 4	53	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 47-68 dBA.
		5.33pm – 5.48pm	Residence 4	53	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 47-69 dBA.
		6.00pm – 6.15pm	Residence 13	48	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Peats Ridge Road traffic noise 57-61 dBA. Insects 40-43 dBA.
		6.15pm – 6.30pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-47 dBA. Peats Ridge Road traffic noise 57-63 dBA. Insects 40-44 dBA.
	Evening (6.00pm – 10.00pm)	6.34pm – 6.49pm	Residence 8	51	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 37-42 dBA. Peats Ridge Road traffic noise 55-62 dBA. Jones Road traffic 60-66 dBA. Dogs nearby 41-48 dBA.
		6.49pm – 7.04pm	Residence 8	57	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 37-42 dBA. Peats Ridge Road traffic noise 55-62 dBA. Jones Road traffic 60-84 dBA. Dogs nearby 41-48 dBA.
		7.10pm – 7.25pm	Residence 3	70		n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-90 dBA. Insects 30-33 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		7.25pm – 7.40pm	Residence 3	69	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-90 dBA. Insects 30-33 dBA.
		7.43pm – 7.58pm	Residence 4	58	27	n/a	35	n/a	Truck movements associated with Site briefly audible 42-44 dBA. Peats Ridge Road traffic noise 67-77 dBA. Insects 30-31 dBA.
		7.58pm – 8.13pm	Residence 4	58	23	n/a	35	n/a	Truck movement associated with Site briefly audible 41-44 dBA. Peats Ridge Road traffic noise 67-76 dBA. Insects 30-31 dBA.
Day 2 (30/4/19)	Night (10.00pm – 7.00am)	5.00am - 5.15am	Residence 3	72	27	42	35	45	Truck movements associated with Site briefly audible 33-42 dBA. Peats Ridge Road traffic noise 80-93 dBA.
		5.15am - 5.30am	Residence 3	74	28	42	35	45	Truck movements associated with Site briefly audible 33-42 dBA. Peats Ridge Road traffic noise 80-92 dBA.
		5.30am - 5.45am	Residence 3	73	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-93 dBA.
		5.45am - 6.00am	Residence 3	73	28	41	35	45	Truck movements associated with Site briefly audible 33-41 dBA. Peats Ridge Road traffic noise 80-94 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		6.03am - 6.18am	Residence 4	57	27	43	35	45	Truck movements associated with Site briefly audible 41-43 dBA. Peats Ridge Road traffic noise 67-74 dBA.
		6.18am - 6.33am	Residence 4	60	28	43	35	45	Truck movements associated with Site briefly audible 41-43 dBA. Peats Ridge Road traffic noise 67-76 dBA.
		6.33am - 6.48am	Residence 4	57	28	43	35	45	Truck movements associated with Site briefly audible 41-43 dBA. Peats Ridge Road traffic noise 67-74 dBA.
		6.48am - 7.03am	Residence 4	57	25	42	35	45	Truck movements associated with Site briefly audible 41-42 dBA. Peats Ridge Road traffic noise 67-78 dBA.
		5.00am - 5.15am	Residence 13	52	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-50 dBA.
		5.15am - 5.30am	Residence 13	51	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-49 dBA. Peats Ridge Road traffic noise 60-66 dBA.
		5.30am - 5.45am	Residence 13	52	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-50 dBA. Peats Ridge Road traffic noise 60-73 dBA. Birds 55-62 dBA.
		5.45am - 6.00am	Residence 13	52	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 45-49 dBA. Peats Ridge Road traffic noise 60-70 dBA. Birds 55-60 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
Day (7.00am – 6.00pm)		6.03am - 6.18am	Residence 8	54	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 56-60 dBA. Roosters 53-54 dBA.
		6.18am - 6.33am	Residence 8	59	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 60-64 dBA. Jones Road traffic 70-83 dBA. Roosters 53-55 dBA.
		6.33am - 6.48am	Residence 8	54	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 60-63 dBA. Jones Road traffic 70-70 dBA. Roosters 50-55 dBA.
		6.48am - 7.03am	Residence 8	53	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 60-65 dBA.
		11.45am - 12.00pm	Residence 8	54	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 55-63 dBA. Jones Road traffic 70-77 dBA. Dogs nearby 52-57 dBA.
		12.00pm - 12.15pm	Residence 8	54	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 58-66 dBA. Jones Road traffic 70-78 dBA.
		12.15pm - 12.30pm	Residence 8	56	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 60-65 dBA. Jones Road traffic 70-83 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		12.30pm – 12.45pm	Residence 8	52	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-68 dBA. Jones Road traffic 70-75 dBA.
		12.45pm - 1.00pm	Residence 8	54	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-69 dBA. Jones Road traffic 70-80 dBA.
		1.00pm - 1.15pm	Residence 8	50	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-66 dBA.
		1.19pm - 1.34pm	Residence 13	48	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-47 dBA. Peats Ridge Road traffic noise 58-60 dBA. Civil works on Peats Ridge Road 30-32 dBA. Birds 45-54dBA.
		1.34pm – 1.49pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-48 dBA. Peats Ridge Road traffic noise 58-62 dBA. Civil works on Peats Ridge Road 30-32 dBA. Birds 45-54dBA.
		1.49pm – 2.04pm	Residence 13	47	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Peats Ridge Road traffic noise 58-59 dBA. Civil works on Peats Ridge Road 30-32 dBA. Birds 45-54dBA.
		2.04pm – 2.19pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-47 dBA. Peats Ridge Road traffic noise 58-60 dBA. Civil works on Peats

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
									Ridge Road 30-32 dBA. Birds 45-55dBA.
		2.19pm – 2.34pm	Residence 13	48	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-47 dBA. Peats Ridge Road traffic noise 58-61 dBA. Civil works on Peats Ridge Road 30-32 dBA. Birds 45-49dBA.
		2.34pm – 2.49pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-46 dBA. Civil works on Peats Ridge Road 30-32 dBA. Peats Ridge Road traffic noise 58-60 dBA.
		2.58pm – 3.13pm	Residence 3	50	38	n/a	41	n/a	Site noise audible: typical engine noise 32-40 dBA and brief impact/articulation/scrapping noise 38-43dBA. Peats Ridge Road traffic noise 49-63 dBA.
		3.13pm – 3.28pm	Residence 3	51	40	n/a	41	n/a	Site noise audible: typical engine noise 34-41 dBA and brief impact/articulation/scrapping noise 40-45dBA. Peats Ridge Road traffic noise 49-62 dBA.
		3.28pm – 3.43pm	Residence 3	49	39	n/a	41	n/a	Site noise audible: typical engine noise 34-41 dBA and brief impact/articulation/scrapping noise 40-43dBA. Peats Ridge Road traffic noise 49-67 dBA.
		3.43pm – 3.58pm	Residence 3	49	31	n/a	41	n/a	Site noise audible: typical engine noise 30-31 dBA. Peats Ridge Road traffic noise 49-69 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		3.58pm – 4.13pm	Residence 3	52	33	n/a	41	n/a	Site noise audible: typical engine noise 30-34 dBA. Peats Ridge Road traffic noise 49-68 dBA.
		4.13pm – 4.28pm	Residence 3	50	33	n/a	41	n/a	Site noise audible: typical engine noise 30-34 dBA. Peats Ridge Road traffic noise 49-68 dBA.
		4.30pm – 4.45pm	Residence 4	52	31	n/a	40	n/a	Site noise barely audible: typical engine noise 30-32 dBA. Peats Ridge Road traffic noise 48-70 dBA.
		4.45pm – 5.00pm	Residence 4	56	31	n/a	40	n/a	Site noise barely audible: typical engine noise 30-32 dBA. Peats Ridge Road traffic noise 48-72 dBA.
		5.00pm – 5.15pm	Residence 4	54	31	n/a	40	n/a	Site noise barely audible: typical engine noise 30-32 dBA. Peats Ridge Road traffic noise 47-70 dBA.
		5.15pm – 5.30pm	Residence 4	56	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 47-72 dBA.
		5.30pm – 5.45pm	Residence 4	55	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 47-71 dBA.
		5.45pm – 6.00pm	Residence 4	51	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 47-69 dBA.
	Evening (6.00pm –	6.05pm – 6.20pm	Residence 13	46	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 39-42 dBA. Peats Ridge Road traffic noise 57-62 dBA. Insects 40-41 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
	10.00pm)	6.20pm – 6.35pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 40-43 dBA. Peats Ridge Road traffic noise 58-63 dBA. Insects 40-42 dBA.
		6.39pm – 6.54pm	Residence 8	52	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 37-40 dBA. Peats Ridge Road traffic noise 53-59 dBA. Jones Road traffic 60-74 dBA. Dogs nearby 45-52 dBA.
		6.54pm – 7.09pm	Residence 8	53	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 37-42 dBA. Peats Ridge Road traffic noise 55-62 dBA. Jones Road traffic 60-80 dBA. Dogs nearby 45-53 dBA.
		7.15pm – 7.30pm	Residence 3	70	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-89 dBA. Insects 30-34 dBA.
		7.30pm – 7.45pm	Residence 3	70	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-91 dBA. Insects 30-34 dBA.
		7.48pm – 8.03pm	Residence 4	52	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 67-76 dBA. Insects 30-33 dBA.
		8.03pm – 8.18pm	Residence 4	52	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 67-74 dBA. Insects 30-32 dBA.
Day 3 (1/5/19)	Night (10.00pm –	5.00am - 5.15am	Residence 3	72	25	41	35	45	Truck movements associated with Site briefly audible 33-41 dBA. Peats Ridge Road traffic noise 80-92 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
	7.00am)	5.15am - 5.30am	Residence 3	74	29	41	35	45	Truck movements associated with Site briefly audible 33-41 dBA. Peats Ridge Road traffic noise 80-92 dBA.
		5.30am - 5.45am	Residence 3	74	25	42	35	45	Truck movements associated with Site briefly audible 33-42 dBA. Peats Ridge Road traffic noise 80-92 dBA.
		5.45am - 6.00am	Residence 3	74	30	42	35	45	Truck movements associated with Site briefly audible 33-42 dBA. Peats Ridge Road traffic noise 80-90 dBA.
		6.03am - 6.18am	Residence 4	58	23	43	35	45	Truck movement associated with Site briefly audible 41-43 dBA. Peats Ridge Road traffic noise 67-77 dBA.
		6.18am - 6.33am	Residence 4	58	25	44	35	45	Truck movement associated with Site briefly audible 41-44 dBA. Peats Ridge Road traffic noise 67-75 dBA.
		6.33am - 6.48am	Residence 4	56	25	43	35	45	Truck movements associated with Site briefly audible 41-43 dBA. Peats Ridge Road traffic noise 67-74 dBA.
		6.48am - 7.03am	Residence 4	56	23	43	35	45	Truck movement associated with Site briefly audible 41-43 dBA. Peats Ridge Road traffic noise 67-75 dBA.
		5.00am - 5.15am	Residence 13	49	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 40-45 dBA. Peats Ridge Road traffic noise 60-68 dBA.
		5.15am - 5.30am	Residence 13	47	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 40-45 dBA. Peats Ridge Road traffic noise 60-63 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		5.30am - 5.45am	Residence 13	50	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 40-46 dBA. Peats Ridge Road traffic noise 60-65 dBA. Birds 55-59 dBA.
		5.45am - 6.00am	Residence 13	54	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 40-47 dBA. Peats Ridge Road traffic noise 60-74 dBA. Birds 55-64 dBA.
		6.03am - 6.18am	Residence 8	54	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-40 dBA. Peats Ridge Road traffic noise 60-65 dBA. Jones Road traffic 70-73 dBA. Roosters 53-55 dBA.
		6.18am - 6.33am	Residence 8	55	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-41 dBA. Peats Ridge Road traffic noise 60-64 dBA. Jones Road traffic 70-79 dBA. Roosters 53-55 dBA.
		6.33am - 6.48am	Residence 8	53	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-41 dBA. Peats Ridge Road traffic noise 60-66 dBA. Roosters 53-54 dBA.
		6.48am - 7.03am	Residence 8	60	Inaudible	Inaudible	35	45	Site operations inaudible at all times. Pacific Motorway traffic noise 35-42 dBA. Peats Ridge Road traffic noise 60-66 dBA. Jones Road traffic 70-82 dBA.
Day	(7.00am – 6.00pm)	11.39am - 11.54am	Residence 8	54	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 60-67 dBA. Dogs nearby 52-

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
									60 dBA.
		11.54am - 12.09pm	Residence 8	56	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 60-70 dBA. Jones Road traffic 70-81 dBA. Dogs nearby 55-63 dBA.
		12.09pm – 12.24pm	Residence 8	55	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-68 dBA. Jones Road traffic 70-80 dBA. Dogs nearby 55-62 dBA.
		12.24pm – 12.39pm	Residence 8	54	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 60-68 dBA. Jones Road traffic 68-72 dBA.
		12.39pm - 12.54pm	Residence 8	55	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-41 dBA. Peats Ridge Road traffic noise 60-68 dBA. Jones Road traffic 70-78 dBA.
		12.54pm - 1.09pm	Residence 8	55	Inaudible	n/a	36	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 38-40 dBA. Peats Ridge Road traffic noise 60-67 dBA. Jones Road traffic 70-75 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		1.14pm - 1.29pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-44 dBA. Peats Ridge Road traffic noise 57-63 dBA. Civil works on Peats Ridge Road 30-32 dBA. Birds 45-49dBA.
		1.29pm – 1.44pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-45 dBA. Peats Ridge Road traffic noise 58-62 dBA. Civil works on Peats Ridge Road 30-32 dBA. Birds 45-49dBA.
		1.44pm – 1.59pm	Residence 13	47	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-45 dBA. Peats Ridge Road traffic noise 57-61 dBA. Civil works on Peats Ridge Road 30-32 dBA. Birds 45-51dBA.
		1.59pm – 2.14pm	Residence 13	47	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-45 dBA. Peats Ridge Road traffic noise 58-64 dBA. Civil works on Peats Ridge Road 30-32 dBA.
		2.14pm – 2.29pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-47 dBA. Peats Ridge Road traffic noise 58-62 dBA. Civil works on Peats Ridge Road 30-32 dBA.
		2.29pm – 2.44pm	Residence 13	47	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-45 dBA. Peats Ridge Road traffic noise 58-61 dBA. Civil works on Peats Ridge Road 30-32 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		2.50pm – 3.05pm	Residence 3	50	41	n/a	41	n/a	Site noise audible: typical engine noise 32-42 dBA and brief impact/articulation/scrapping noise 38-45dBA. Peats Ridge Road traffic noise 50-65 dBA.
		3.05pm – 3.20pm	Residence 3	50	39	n/a	41	n/a	Site noise audible: typical engine noise 34-41 dBA and brief impact/articulation/scrapping noise 40-42dBA. Peats Ridge Road traffic noise 50-65 dBA.
		3.20pm – 3.35pm	Residence 3	52	39	n/a	41	n/a	Site noise audible: typical engine noise 32-40 dBA and brief impact/articulation/scrapping noise 40-43dBA. Peats Ridge Road traffic noise 50-69 dBA.
		3.35pm – 3.50pm	Residence 3	49	35	n/a	41	n/a	Site noise audible: typical engine noise 32-37 dBA. Peats Ridge Road traffic noise 49-65 dBA.
		3.50pm – 4.05pm	Residence 3	50	Inaudible	n/a	41	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 49-64 dBA.
		4.05pm – 4.20pm	Residence 3	50	32	n/a	41	n/a	Site noise audible: typical engine noise 30-33 dBA. Peats Ridge Road traffic noise 49-65 dBA.
		4.23pm – 4.38pm	Residence 4	54	31	n/a	40	n/a	Site noise barely audible: typical engine noise 30-32 dBA. Peats Ridge Road traffic noise 49-75 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		4.38pm – 4.53pm	Residence 4	56	31	n/a	40	n/a	Site noise barely audible: typical engine noise 30-32 dBA. Peats Ridge Road traffic noise 49-77 dBA.
		4.53pm – 5.08pm	Residence 4	55	31	n/a	40	n/a	Site noise barely audible: typical engine noise 30-32 dBA. Peats Ridge Road traffic noise 49-70 dBA.
		5.08pm – 5.23pm	Residence 4	59	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 49-70 dBA.
		5.23pm – 5.38pm	Residence 4	58	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 49-69 dBA.
		5.38pm – 5.53pm	Residence 4	54	Inaudible	n/a	40	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 49-69 dBA.
		6.00pm – 6.15pm	Residence 13	49	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-48 dBA. Peats Ridge Road traffic noise 57-64 dBA. Insects 40-44 dBA.
Evening (6.00pm – 10.00pm)		6.15pm – 6.30pm	Residence 13	48	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 41-48 dBA. Peats Ridge Road traffic noise 57-62 dBA. Insects 40-43 dBA.
		6.34pm – 6.49pm	Residence 8	50	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 37-42 dBA. Peats Ridge Road traffic noise 55-63 dBA. Jones Road traffic 60-79 dBA. Dogs nearby 42-47 dBA.

Day	Assessment Period	Time	Location	Overall L _{Aeq,15min} (dBA)	L _{Aeq,15min} due to Site Noise (dBA)	L _{A1,1min} due to Site Noise (dBA)	L _{Aeq,15min} Noise Limit (dBA)	L _{A1,1min} Noise Limit (dBA)	Comments
		6.49pm – 7.04pm	Residence 8	53	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Pacific Motorway traffic noise 37-41 dBA. Peats Ridge Road traffic noise 55-60 dBA. Jones Road traffic 60-80 dBA.
		7.10pm – 7.25pm	Residence 3	70	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-91 dBA. Insects 30-33 dBA.
		7.25pm – 7.40pm	Residence 3	72	Inaudible	n/a	35	n/a	Site operations inaudible at all times. Peats Ridge Road traffic noise 80-91 dBA. Insects 30-32 dBA.
		7.43pm – 7.58pm	Residence 4	59	28	n/a	35	n/a	Truck movements associated with Site briefly audible 41-45 dBA. Peats Ridge Road traffic noise 67-75 dBA. Insects 30-33 dBA.
		7.58pm – 8.13pm	Residence 4	57	26	n/a	35	n/a	Truck movements associated with Site briefly audible 41-44 dBA. Peats Ridge Road traffic noise 68-75 dBA. Insects 30-31 dBA.