

17 MCDONALD PLACE, EVANS
HEAD

31ST OCTOBER 2023

NOISE IMPACT
ASSESSMENT

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DOCUMENT CONTROL

Revision number	Description	Prepared	Reviewed	Issued	Issue date
A	Draft client review	MK			20/9/23
B	Development Application	MK	MK	MK	31/10/23

Document title: 17 McDonald Place, Evans Head – Noise Impact Assessment
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1. INTRODUCTION

Ingen Consulting P/L has been engaged by 17 The Evans Trust to prepare a Noise Impact Assessment (NIA) for a proposed mixed-use development at 17 McDonald Place in Evans Head, NSW.

1.1. Scope

This NIA is prepared for 17 McDonald Place in Evans Head, NSW. The NIA is to assess the proposed development for compliance with the 2017 NSW Government's Noise Policy for Industry (NPfI).

This NIA has been prepared in accordance with the following standards, guidelines and policies:

- NSW Environment Protection Authority *Noise Policy for Industry*, October 2017
- Australian Standard 1055 series (Acoustics – Description and measurement of environmental noise)
- Australian Standard 2659 series (Guide to the use of sound measuring equipment)
- 2021 Richmond Valley DCP Part I-7

In particular, Council's Environment & Health Coordinator requested the following items are addressed in detail:

1. The noise impact of the roof top area on neighbouring residents
2. The noise impact of residents at the subject site of RLS patrons leaving at night, primarily the closing of car doors and starting of cars in the car park
3. The noise impact of the use of the 'return and earn' on residents at the subject site.

1.2. Site description

The subject site is located at 17 McDonald Place in Evans Head, NSW. The land is formally identified as Lot 7 DP14089 and is located on the corner of McDonald Place and Elm Street. Figure 1 shows the location of the subject site.

The subject land is bounded by the RSL car park on its eastern and southern boundary. A 'return and earn' facility is located adjacent its southern boundary. At the 'return and earn' empty bottles and cans are collected. The 'Evans Head Village', is a temporary accommodation site for flood victims on the northern side of McDonald Place. To the west, on the opposite side of Elm Street, Adjacent Woodburn Street a 2-story residential development was under construction at the time of our site inspection. Then A low-density residential area is located west of Elm Street, but south of Cedar Street.



Figure 1 | Lot 7 DP14089 Location (proposed development site), Source of the map: Richmond Valley Council 2023

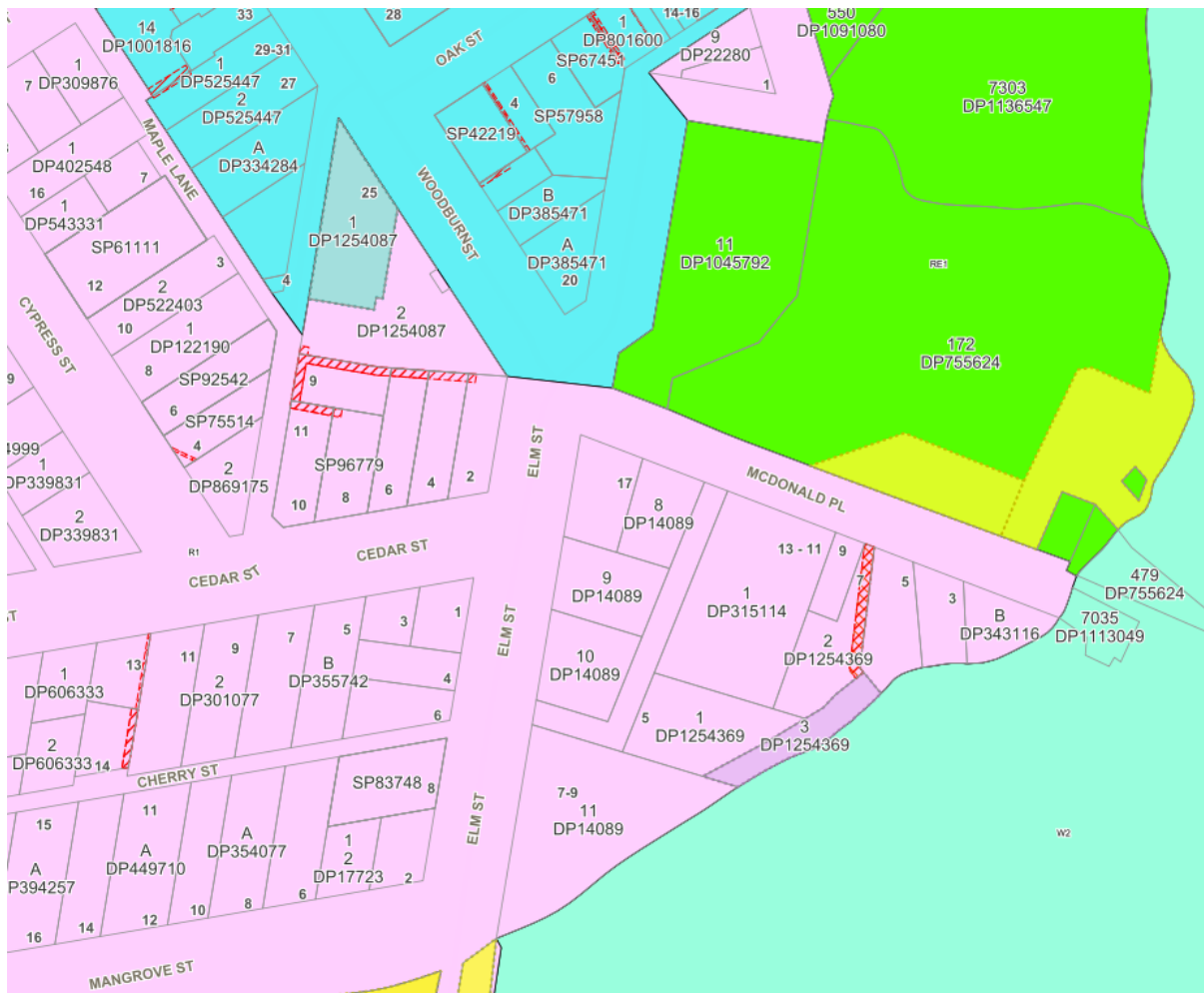


Figure 2 | Land Zoning Map, Source: Richmond Valley Intramaps

Council's zoning map (Figure 2) shows the land is located in an R1 – General Residential zone. Then to the northeast the land is zoned 'RE1 - Public Recreation' and to the northwest it is zoned 'B2 – Local Centre'.

The objectives of the R1 General Residential zone are defined in the 2012 LEP as follows:

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To ensure that housing densities are generally concentrated in locations accessible to public transport, employment, services and facilities.
- To minimise conflict between land uses within the zone and land uses within adjoining zones.

1.3. Proposed development

The proposed development is to demolish the existing abandoned building and construct a 3-storey mixed-use development which includes:

- Ground Floor: car parking and café
- First Floor: five residential apartments and two communal gardens
- Second Floor: five residential apartments with communal open space and roof garden
- Roof top: communal area and mechanical services



Figure 3 | Artist impression of proposed development, Source: Barker Architects

We understand that the residential apartments will be for long-term residential only, not for holiday letting.

The proposed times of operation for the cafe is 6am to 10pm daily.

1.4. Abbreviations and definitions

Commonly used terms and abbreviations throughout this report are:

Table 1 | Abbreviations and definitions

Term/abbreviation	Definition
A-weighting	Adjustment made to sound level measurements to approximate the response of the human ear.
Ambient noise	The all-encompassing noise associated with a given environment. It is the composite of sounds from many sources, both far and near.
Amenity noise level	A noise level intended to limit continuing and cumulative increases in noise level due to consecutive developments.
Annoyance	An emotional state connected to feelings of discomfort, anger, depression and helplessness. It is generally measured by means of the ISO15666 defined questionnaire (EEA, 2010).
Assessment period	The period in a day over which assessments are made: day, evening, or night.
Assessment background level	The single-figure background level representing each assessment period.
Background noise	The underlying level of noise present in ambient noise, generally excluding the noise source under investigation, when extraneous noise is removed. This is described using the L_{AF90} descriptor.
Best available technology achievable (BATEA)	Equipment, plant and machinery incorporating the most advanced and affordable technology available to minimise noise output.
Best management practice (BMP)	Adoption of particular operational procedures that minimise noise while retaining productive efficiency.
C-weighting	Adjustment made to sound level measurements that takes into account the low-frequency components of noise within the audibility range of humans.
Compliance	The process of checking that source noise levels meet with the noise limits in a statutory context.
Construction activities	Activities that are related to the establishment phase of a development and that will occur on a site for only a limited period of time.

Term/abbreviation	Definition
Day	The period from 7am to 6pm (Monday to Saturday) and 8am to 6pm (Sundays and public holidays)
Decibel (dB)	A measure of sound level. The decibel is a logarithmic way of describing a ratio. The ratio may be power, sound pressure, voltage, intensity or other. In the case of sound pressure, it is equivalent to ten times the logarithm (to base ten) of the ratio of a given sound pressure squared to a reference sound pressure squared.
EP&A Act	Environmental Planning and Assessment Act 1979.
Evening	The period from 6pm to 10pm.
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 day traffic is not considered to be extraneous.
Feasible and reasonable mitigation	Noise mitigation that can be engineered and is practical and the benefits of which outweigh adverse social, economic and environmental effects, including cost.
Greenfield site	Undeveloped land.
Impulsive noise	Noise with a high peak of short duration or a sequence of such peaks
Industrial noise source	Typically includes manufacturing, extractive industry, commercial use, warehouse, maintenance and repair, intensive agricultural and livestock, utility and reticulation services.
Intrusive noise	Refers to noise that intrudes above the background level by more than 5 decibels.
$L_{AF90, 15min}$	The A-weighted sound pressure level measured using fast time weighting that is exceeded for 90% of the time over a 15-minute assessment period. This is a measure of background noise.
$L_{Aeq, T}$	The time-averaged sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound, that with a measurement time interval T, has the same mean square sound pressure level as a sound under consideration with a level that varies with time.
Low frequency	Noise containing major components in the low-frequency range (10Hz to 160 Hz).
Median	The middle value in a number of values sorted in ascending or descending order. For an odd number of values this is the middle value. For an even number of values this is the arithmetic average of the two middle values.
Noise limits	Enforceable noise levels that appear in conditions on consents and licences.
Night	The period from 10pm to 7am (Monday to Saturday) and 10pm to 8am (Sundays and public holidays).

Term/abbreviation	Definition
Noise-sensitive land uses	Land uses that are sensitive to noise, such as residential areas, churches, schools and recreation areas.
Operator	Noise-source manager.
Project noise trigger levels (PNTL)	Target noise levels for a particular noise-generating facility. They are based on the most stringent of the project intrusiveness level and the project amenity noise level.
Proponent	The developer of the industrial noise source.
Rating background level (RBL)	The overall, single-figure background level representing each assessment period over the whole monitoring period. This is the level used for assessment purposes.
Receiver	The noise-sensitive land use at which noise from a development can be heard.
Tonality	Noise containing a prominent frequency and characterised by a definite pitch.

2. NOISE REGULATIONS

The 2021 Richmond Valley Development Control Plan, the 2017 Noise Policy for Industry and the 2013 Noise Guideline for Local Government address the control of noise emissions as outlined below.

2.1. 2021 Richmond Valley DCP I-7

Part I-7 of the 2021 Richmond Valley DCP addresses Noise Impact Assessment (NIA) requirements. Council's staff have required that the NIA for the subject development shall be a 'High degree NIA, which comprehensively addresses all potential noise impacts. As such, the scope for this report includes background noise testing and detailed SoundPLAN modelling of all noise sources, as well as a review of the potential for land use conflicts due to the 'return and earn' facility and the RSL.

2.2. 2023 Noise Guide for Local Government

The 2023 Noise Guide for Local Government (NGLG) will generally be used by council officers when assessing local noise problems under the legal framework of the Protection of the Environment Operations Act 1997 (POEO Act) and the Protection of the Environment Operations (Noise Control) Regulation 2008 (Noise Control Regulation), which generally addressed the issue of 'offensive noise'. It defines offensive noise as noise:

- A.** *That, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:*
- (a) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or*
 - (b) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or*
- B.** *That is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations"*

Section 4.2.1. of the NGLG explains that the definition of offensive noise is based on evaluating whether noise is (or is likely to be) harmful or interferes unreasonably with comfort or repose, where this is due to:

- The (noise) level, nature, character or quality, or
- Time of day (or night), or
- Any other circumstances.

Inherent characteristics that may be experienced as offensive generally are associated with impulsiveness, tonality and low frequency. An often-used test for audibility is the ‘intrusive noise’ test of measured L_{Aeq} at the background $L_{A90} + 5dB$ as a limit.

Furthermore, the NGLG provides a list of factors to be considered for assessing offensive noise. These are:

Table 19 Factors to be considered for assessing offensive noise

Definition part	Non-exhaustive list of considerations
Offensive noise means noise that, by reason of its:	
<ul style="list-style-type: none"> level, nature, character or quality, or 	<p>Does the noise level exceed noise level conditions on consents or approvals?</p> <p>or</p> <p>Is the noise level extremely loud in an absolute sense? Its volume alone may be annoying, such as music being played at a volume so high that it can be heard, for example, over construction work.</p> <p>or</p> <p>Is the noise level extremely loud in a relative sense – that is, very loud in comparison with the background noise? An example is loud activity occurring during the dead of night. Measurements can help to determine how loud the noise is relative to the background noise level in an area.</p> <p>or</p> <p>Does the noise occur for a long period of time?</p> <p>or</p> <p>Does the noise occur often? Noise can be more annoying when it occurs frequently. Examples might be a leaf blower used every morning or a band that practises frequently without regard to the impact on neighbours.</p> <p>or</p> <p>Is the nature of the – for example, is it screeching, squealing, high-pitched, whining, a low-frequency rumble or intermittent? The presence of tones, impulses or fluctuations in volume can make people more likely to react to the noise. These can be judged subjectively, but noise measurements will help to quantify the extent of these characteristics. Assessment against relevant government policies may assist (see section 9).</p>
<ul style="list-style-type: none"> time at which it is made, or 	<p>Is the noise present at night when people are trying to sleep? Noise that regularly disturbs sleep is likely to be considered offensive by complainants.</p> <p>or</p> <p>Is the noise present during the evenings or weekends when people expect to enjoy peace and quiet? Is the noise making it difficult to have a conversation, study, read or watch TV?</p>

Definition part	Non-exhaustive list of considerations
<ul style="list-style-type: none"> any other circumstances, or 	<p>Is the noise atypical for the area? Is the activity in alignment with the zoning of the area? Where noise from an activity that is causing nuisance is new or unusual for an area, people are more likely to react. Look at the typical uses of the area and determine whether the activity is consistent with the local environmental plan. An example might be a community event with amplified music affecting a residential area that has not traditionally been affected by such events.</p> <p>or</p> <p>Is the activity producing noise that is unnecessary</p> <ul style="list-style-type: none"> it could easily be mitigated (for example plant/equipment operated in a proper and efficient manner, conducted at a more appropriate time or conducted away from residents) it is frivolous (for example, use of noisy tools for activities that can be accomplished without the use of tools, or making noise for the sake of making noise)?
<ul style="list-style-type: none"> it is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted. 	<p>Is there evidence of harm?</p> <p>Note: It is unlikely that environmental noise would result in direct physiological harm, for example hearing loss. However, harm may take the form of extreme annoyance, distress, frustration, fatigue, etc. In some cases, a complaint may have supporting evidence from a medical practitioner. However, it needs to be borne in mind that a clear and transparent link between the noise and any adverse health outcome may be difficult to establish with certainty.</p> <p>or</p> <p>If a noise study has been conducted, consider the findings of the study.</p> <p>or</p> <p>Is the complainant's response to the noise typical of the broader community and reasonable? Are there other residents who are subjected to the same noise levels but are not affected by the noise? Are there other complainants? Only one person needs to be harmed by the noise for it to be offensive. However, talking to other neighbours likely to be exposed to the same noise about how it affects them may assist in deciding whether it is likely to be harmful and whether the evidence from the individual can be corroborated.</p> <p>or</p> <p>Is the noise maker reasonable? Can the activity be easily accomplished in a much quieter manner or can the noise be easily mitigated?</p>
<p>Offensive noise is noise that is</p>	

Definition part	Non-exhaustive list of considerations
<ul style="list-style-type: none"> of a level, nature, character or quality prescribed by the regulations, or 	<p>Does the noise level comply with the POEO Noise Control Regulation?</p> <ul style="list-style-type: none"> cl 5 – Use on roads of motor vehicles capable of emitting noise in excess of the prescribed level. <p>Is the noise’s nature and character in contravention of the regulations?</p> <ul style="list-style-type: none"> cl 25 – Use of alarms that sound in excess of prescribed length of time cl 26 – Design and construction of alarms that contravene the regulations cl 27 – Attaching certain motor vehicle horns cl 28 – Use of certain motor vehicle horns.
<ul style="list-style-type: none"> made at a time, or in other circumstances, prescribed by the regulations. 	<p>Is the noise in contravention of the time-of-use provisions in the POEO Noise Control Regulation?</p> <ul style="list-style-type: none"> cl 8 – Use of motor vehicles on residential premises cl 9 – Use of refrigeration units fitted to motor vehicles near residential premises cl 51 – Use of power tools on residential premises cl 52 – Use of pumps on residential premises cl 53 – Use of heat-pump water heaters cl 57 – Use of musical instruments cl 58 – Use of electrically amplified sound equipment <p>Is the noise due to other circumstances prescribed in the POEO Noise Control Regulation?</p> <ul style="list-style-type: none"> cl 11 – Driving or using vehicles with defective noise control equipment cl 14 – Use of vehicles with unauthorised temporary noise reduction packing cl 17 – Use of vehicles with unauthorised temporary noise reduction equipment cl 24 – Use of alarms with panic or override switches cl 62 – Use of a motor vehicle in breach of a defective vehicle notice cl 63 – Use of a vessel in breach of a defective vessel notice cl 64 – Use of a vessel in breach of a defective vessel label

Figure 4 | NGLG Table 19, Source: 2023 NGLG

2.3. 2017 Noise Policy for Industry (NPI)

The Noise Policy for Industry defines a project noise trigger level (PNTL), which provides a benchmark or objective for assessing a proposal or site. It is not intended for use as a mandatory requirement. The project trigger level is a level that, if exceeded, would indicate a potential noise impact on the community, and so ‘trigger’ a management response; for example, further investigation of mitigation measures.

The PNTL, feasible and reasonable mitigation, and consideration of residual noise impacts are used together to assess noise impacts and manage the noise from a proposal or site. It is the combination

of these elements that is designed to ensure that acceptable noise outcomes are determined by decision makers.

The PNTL is defined as the lower value of the project intrusiveness noise level and the project amenity noise level. The project intrusiveness noise level is calculated in chapter 3 and is defined as the Rating Background Level + 5 dB.

The 5dB(A) difference between the recommended and the project amenity noise level is provided ensure that when several industrial developments happen in the same area, all claiming an amenity noise level, that the combined effect of these developments does not result in an excessive noise amenity level.

The project amenity noise level is defined as the recommended amenity noise level minus 5 dB(A) plus 3dB to convert from a period level to a 15-minute level. The Recommended and Project amenity noise levels for residential and holiday accommodation receivers are provided in Table 2.

Table 2 | Amenity noise levels

Receiver	Noise area	Time of day	Recommended amenity noise level L_{Aeq} , dB(A)	Project Amenity Noise Level, L_{Aeq} , $_{15min}$, dB(A)
Residential	Rural	Day	50	48
		Evening	45	43
		Night	40	38
	Suburban	Day	55	53
		Evening	45	43
		Night	40	38
	Urban	Day	60	58
		Evening	50	48
		Night	45	43
Commercial premises	All	When in use	65	63
Hotels, motels, caretaker's quarters, holiday accommodation,	Rural	Day	50	53
		Evening	45	48
		Night	40	43
	Suburban	Day	55	58
		Evening	45	48

Receiver	Noise amenity area	Time of day	Recommended amenity noise level L_{Aeq} , dB(A)	Project Amenity Noise Level, L_{Aeq} , _{15min} , dB(A)
permanent resident caravan parks	Urban	Night	40	43
		Day	60	63
		Evening	50	53
		Night	45	48

The PNTL will be determined in chapter 4 based on the background noise survey results.

2.4. Application

Based on the policies outlined in this chapter, the purpose of this report is to assess the proposed development for compliance with the following requirements:

- Venue operation in accordance with the 2017 Noise Policy for Industry
- The venue shall not generate offensive noise as defined in the Protection of the Environment Operations Act 1997.
- Ensure compliance with the Protection of the Environment Operations (Noise Control) Regulation 2008.
- Assess the risk of existing adjacent operations (Return & Earn and RSL) creating offensive noise at the subject property.

3. BACKGROUND NOISE

Background noise testing was carried out to determine applicable Rating Background Levels (RBL's) for the surrounding properties.

3.1. Testing methodology

The preferred method for determining RBL's is through a 7-day unattended background noise survey. However, when arriving on site to install the logger, it became evident that there is occasional illegal occupation of the premises and therefore there was no safe and secure location to leave the equipment for that duration.

Another option would have been to place the logger at a neighbouring site, however the nearest residential properties south of Cedar Street were either too far away from the site, or close to a construction site, too densely built up or no visual security from the street.

As a result, in consultation with Council staff it was decided to carry out attended noise testing to determine background levels. An added benefit of this is that it allowed us to carry out testing at multiple locations, thus enabling the determination of background levels for each receiver specifically. Attended background testing was carried out during the day on Monday the 11th of September 2023, and during the evening and at night on Thursday the 14th of September.

3.2. Equipment used

The following equipment was used for the background noise survey:

- 2 x Bruel and Kjaer 2250 Sound Level Meter, Serial No. 3006868 & 3028735, Calibration dates December 2021 and January 2022 (resp.)
- Bruel and Kjaer Acoustical Calibrator model 4231, Serial No. 2292735, Calibration date December 2021
- Bruel and Kjaer Integral windscreen UA-1679

The sound level meter (SLM) used during the noise survey conforms to Australian Standard 1259 "Acoustics – Sound Level Meters" (1990) as type 1 precision sound level meters and have an accuracy suitable for both field and laboratory use. The meter's calibrations were checked in the field before and after the measurement periods with a Bruel and Kjaer acoustical calibrator model 4231. No significant system drift occurred over the measurement periods.

The SLM and calibrator have been checked, adjusted and aligned to conform to the Bruel and Kjaer factory specifications and issued conformance certificates. The internal test equipment is traceable to the National Measurement Laboratory at CSIRO, Lindfield, NSW.

3.3. Survey locations

The attended survey locations are shown in Figure 5 below. Survey locations were selected on the sides of buildings facing the subject development to best represent the existing conditions of the worst affected façade.



Figure 5 | Attended test locations



Figure 6 | Attended test location photos (from top left to bottom right: D, E, B, D)

A description of each test location is provided in the table below.

Table 3 | Noise survey location summary

Location ID	Test result ID's	Description
A	230914 001 & 230914 002	On-site test location, providing continuous background reference results for the duration of the evening and night time testing, and recording impacts of night time RSL car park use on the subject site.
B	Project 004, Project 006 and Project 010	Survey location representing 5 Elm Street and 7 Elm Street.
C	Project 007 & Project 011	Survey location representing 1 Cedar Street and 4 Elm Street
D	Project 001, Project 008 & Project 012	Survey location representing 2 Cedar Street

E	Project 003	Survey location representing the Evans Head Village caravan park
F	Project 009 & Project 013	Survey location representing the Evans Head Village caravan park
G	Project 005	Survey location representing the Evans Head Village caravan park
H	Project 002	Test location on southern boundary to record noise levels from the use of the Return and Earn facility

3.4. Background survey results

The attended noise survey conditions are listed in Table 4 below. Test results are shown in Table 5. The 1/3 octave spectral data of each test is depicted in the figures below. It was observed on the 14th of September that due to the vicinity of the ocean and the dominance of the surf, background levels throughout the night were unlikely to drop below those recorded during the testing. It is therefore warranted to adopt the measured values as night time background levels. The surf was relatively quiet as there were no storms in the vicinity during the testing or during the days leading up to the testing. High tide on 14 September was 19:58, therefore the testing commenced shortly after high tide and was conducted during outgoing tide.

Table 4 | Attended survey conditions

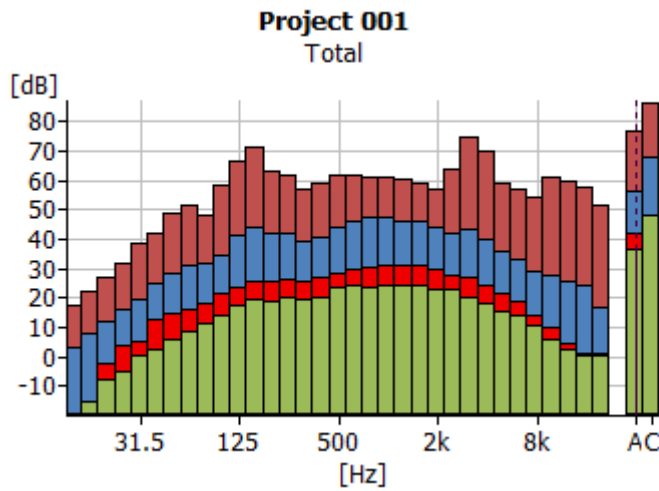
Parameter	Day-time testing	Evening/night time testing
Date	11 th September 2023	14 th September 2023
Temperature	19°C	8pm: 19°C, 10:30pm: 10°C
Humidity	61%	85%
Cloud cover	Partially overcast, some sun	Nil – clear sky
Wind	SW breeze	Easterly breeze from the ocean
Dominant noise sources	Traffic (non-continuous)	Ocean (continuous)
Other noise sources	Foliage, birds, RSL flag pole, return and earn facility	Traffic, RSL kitchen, RSL patrons leaving

Table 5 | Test results

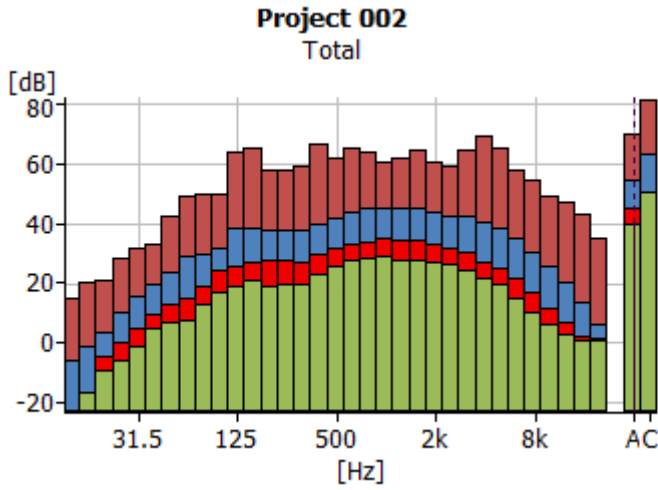
File name	Location	Start time	Finish time	L _{Amax} , dB	L _{Aeq} , dB	L _{A,90} dB
Project 001	D	10:24:05	10:43:05	76.8	56.4	41.8
Project 002	H	10:44:53	10:59:53	70.3	54.7	45.0

Project 003	E	10:03:44	11:18:44	71.1	52.6	41.4
Project 004	B	11:24:52	11:40:02	65.9	49.4	41.1
Project 005	G	11:44:46	12:00:11	72.4	52.9	45.2
Project 006	B	20:17:15	20:32:30	65.4	43.7	39.6
Project 007	C	20:33:46	20:51:14	65.9	47.3	39.5
Project 008	D	20:53:51	21:09:51	67.6	49.6	39.1
Project 009	F	21:11:01	21:26:01	59.3	41.3	35.5
Project 010	B	21:34:37	21:49:51	59.4	42.8	37.7
Project 011	C	21:51:49	22:06:49	61.4	42.9	37.2
Project 012	D	22:08:10	22:23:17	64.2	43.4	36.3
Project 013	F	22:24:27	22:39:27	54.8	38.5	34.6
230914 001	A	20:11:10	21:31:35	97.4*	53.1	35.6
230914 002	A	21:32:54	22:41:17	71.6	40.5	34.4

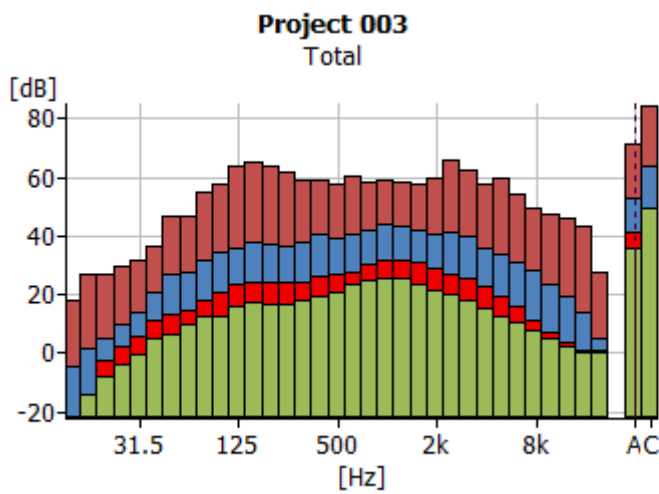
* due to microphone pole falling over at 21:00:44



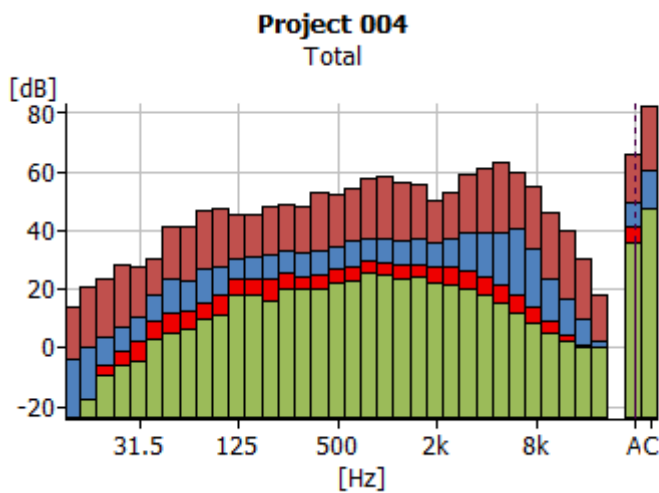
Cursor values
 LAFmax: 76.8 dB
 LAeq: 56.4 dB
 LAF90.0: 41.8 dB
 LAFmin: 36.4 dB



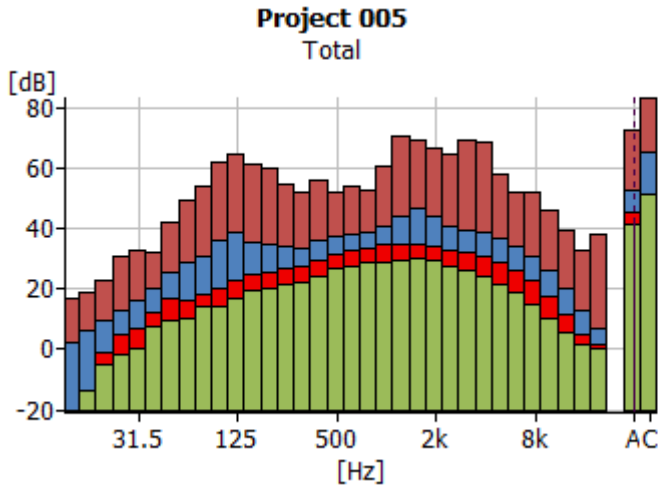
Cursor values
 LAFmax: 70.3 dB
 LAeq: 54.7 dB
 LAF90.0: 45.0 dB
 LAFmin: 39.9 dB



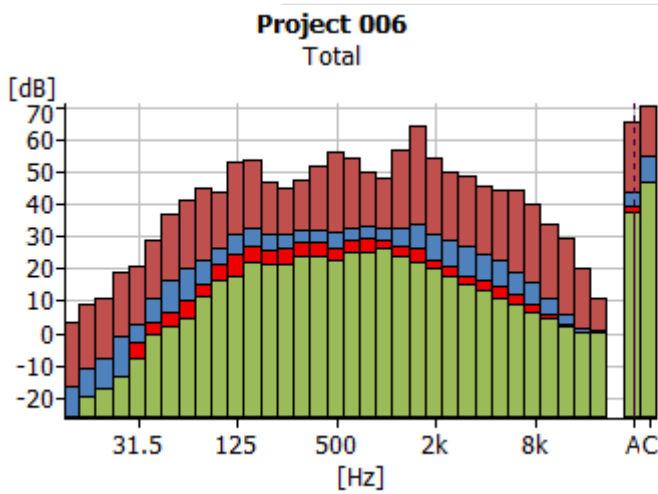
Cursor values
 LAFmax: 71.1 dB
 LAeq: 52.6 dB
 LAF90.0: 41.4 dB
 LAFmin: 36.1 dB



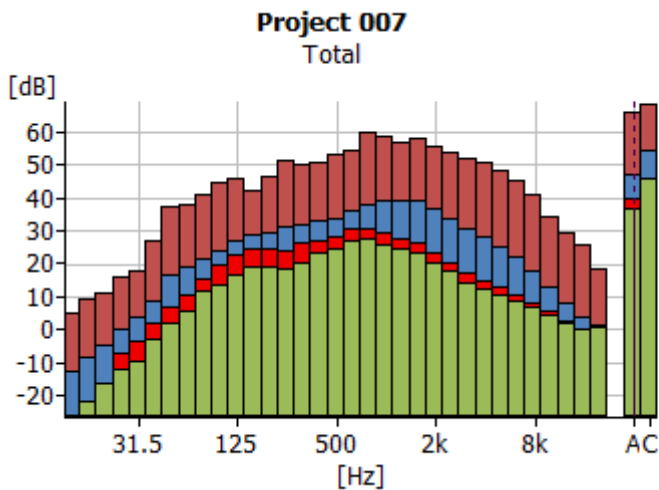
Cursor values
 LAFmax: 65.9 dB
 LAeq: 49.4 dB
 LAF90.0: 41.1 dB
 LAFmin: 35.8 dB



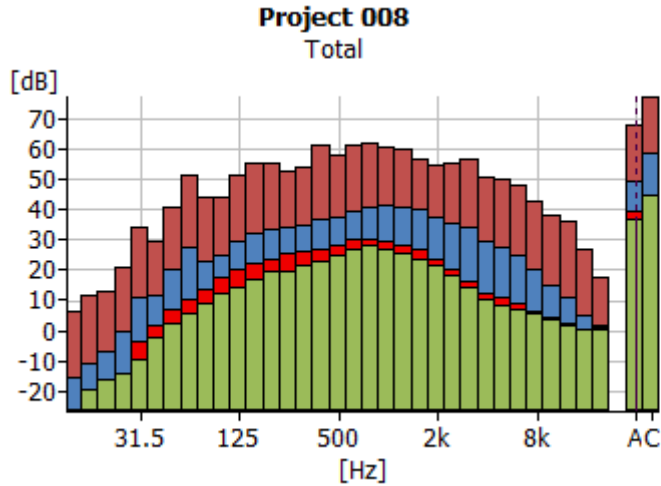
Cursor values
 LAFmax: 72.4 dB
 LAeq: 52.9 dB
 LAF90.0: 45.2 dB
 LAFmin: 41.3 dB



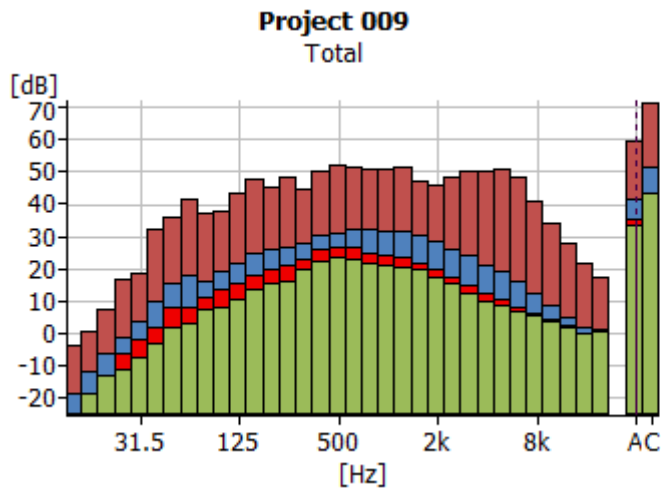
Cursor values
 LAFmax: 65.4 dB
 LAeq: 43.7 dB
 LAF90.0: 39.6 dB
 LAFmin: 37.3 dB



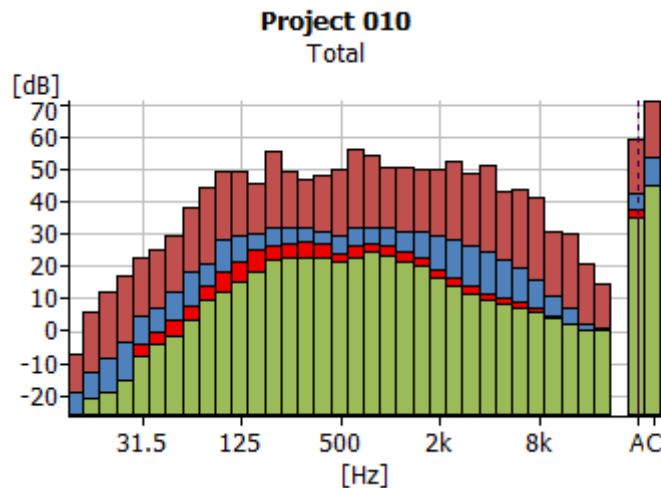
Cursor values
 LAFmax: 65.9 dB
 LAeq: 47.3 dB
 LAF90.0: 39.5 dB
 LAFmin: 36.7 dB



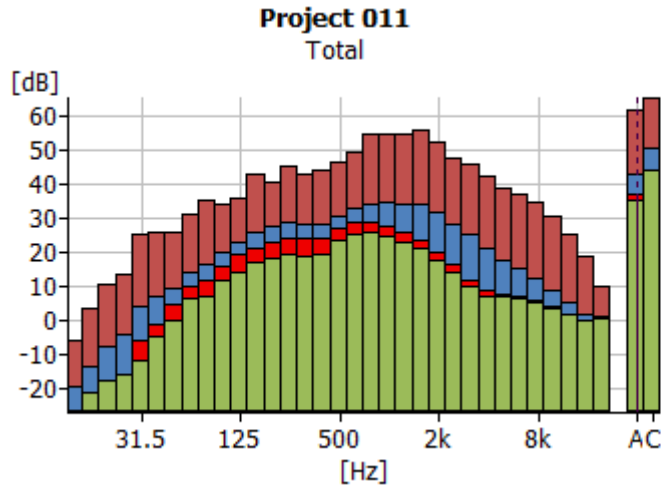
Cursor values
 LAFmax: 67.6 dB
 LAeq: 49.6 dB
 LAF90.0: 39.1 dB
 LAFmin: 36.7 dB



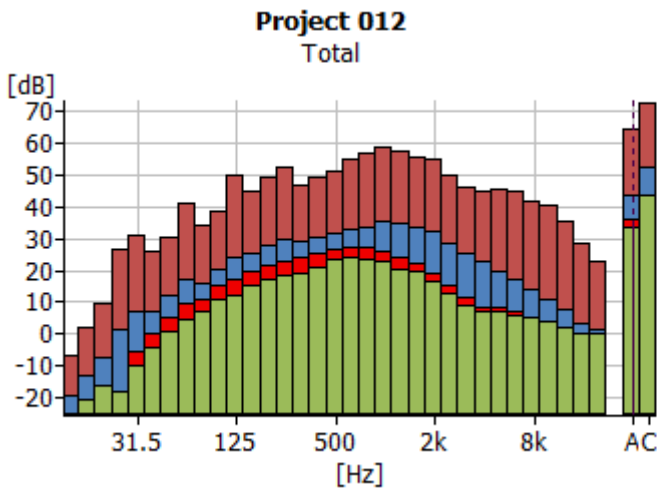
Cursor values
 LAFmax: 59.3 dB
 LAeq: 41.3 dB
 LAF90.0: 35.5 dB
 LAFmin: 33.6 dB



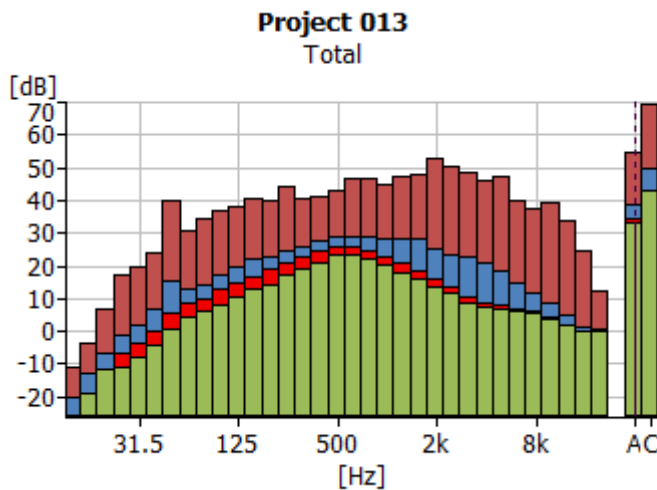
Cursor values
 LAFmax: 59.4 dB
 LAeq: 42.8 dB
 LAF90.0: 37.7 dB
 LAFmin: 35.2 dB



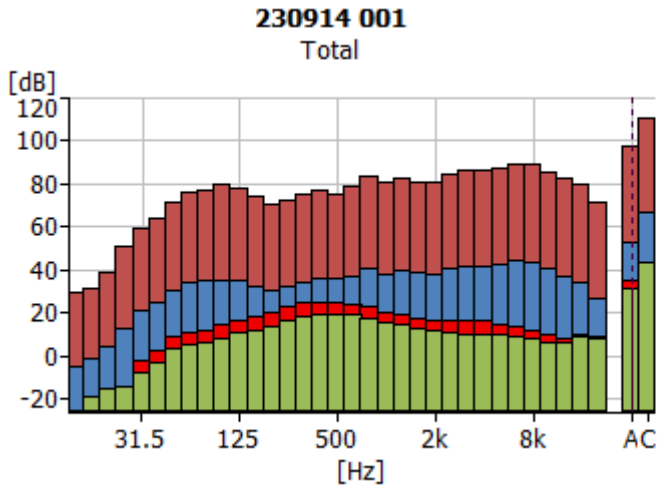
Cursor values
 LAFmax: 61.4 dB
 LAeq: 42.9 dB
 LAF90.0: 37.2 dB
 LAFmin: 34.9 dB



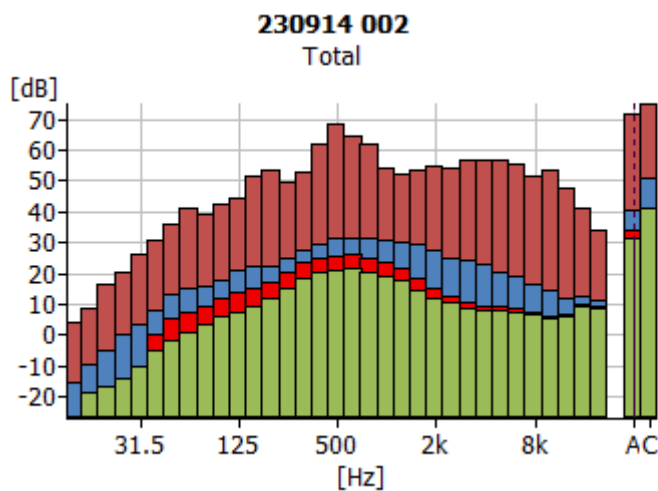
Cursor values
 LAFmax: 64.2 dB
 LAeq: 43.4 dB
 LAF90.0: 36.3 dB
 LAFmin: 33.6 dB



Cursor values
 LAFmax: 54.8 dB
 LAeq: 38.5 dB
 LAF90.0: 34.6 dB
 LAFmin: 33.0 dB



Cursor values
LAFmax: 97.4 dB
LAeq: 53.1 dB
LAF90.0: 35.6 dB
LAFmin: 31.2 dB



Cursor values
LAFmax: 71.6 dB
LAeq: 40.5 dB
LAF90.0: 34.4 dB
LAFmin: 31.1 dB

3.5. Rating Background Levels

The nearest receivers adopted for this proposal are listed in the table below, together with the adopted RBL based on the attended testing described above. Although the village at R1 was present at the time of testing, it is understood that this is a temporary village for local residents who can not return home due to flood damage. It is unknown to us at this time how long this village will be in place or what its future is. We have therefore included this village in our assessment but will assess it to 'permanent resident caravan park' requirements as per Table 2.

Table 6 | Rating Background Levels

Receiver ID	Address / description	Type / Use	Rating Background Level, dB(A)		
			Day	Evening	Night
R1	Evans Head Village	Caravan Park	41.4	35.5	34.6
R2	5 Elm Street	Residential	41.1	39.6	37.7

R3	7 Elm Street	Residential	41.1	39.6	37.7
R4	4 Elm Street	Residential	41.8**	39.5	37.2
R5	1 Cedar Street	Residential	41.8**	39.5	37.2
R6	2 Cedar Street	Residential	41.8	39.1	36.3

**Same adopted as R6 for day time

3.6. Project Noise Trigger Levels

The Project Noise Trigger Levels (PNTL's) are determined as the lesser of the Project Intrusiveness Noise Level (PINL) (Table 7) and the Project Amenity Noise Level (PANL). The PTNL's are determined in Table 8.

Table 7 | Project Intrusiveness Noise Levels

Receiver ID	Rating Background Level, dB(A)			Project Intrusiveness Noise Level, dB(A)		
	Day	Evening	Night	Day	Evening	Night
R1	41.4	35.5	34.6	46.4	40.5	39.6
R2	41.1	39.6	37.7	46.1	44.6	42.7
R3	41.1	39.6	37.7	46.1	44.6	42.7
R4	41.8**	39.5	37.2	46.8	44.5	42.2
R5	41.8**	39.5	37.2	46.8	44.5	42.2
R6	41.8	39.1	36.3	46.8	44.1	41.3

Table 8 | Project Trigger Noise Levels

Receiver ID	Project Intrusiveness Noise Level, dB(A)			Project Amenity Noise Level, dB(A)			Project Noise Trigger Levels, dB(A)		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
R1	46.4	40.5	39.6	58	48	43	46.4	40.5	39.6
R2	46.1	44.6	42.7	53	43	38	46.1	43	38
R3	46.1	44.6	42.7	53	43	38	46.1	43	38
R4	46.8	44.5	42.2	53	43	38	46.8	43	38
R5	46.8	44.5	42.2	53	43	38	46.8	43	38
R6	46.8	44.1	41.3	53	43	38	46.8	43	38



Figure 7 | Receiver locations

4. DEVELOPMENT IMPACT

This chapter addresses the noise impact of the proposed development on existing receivers. All noise emission modelling is carried out using SoundPLAN v 8.1

4.1. Topography

A Digital Ground Model (DGM) is created in SoundPLAN using LiDAR contours for the site and its surrounds. The resulting DGM is shown in Figure 8 below.



Figure 8 | Digital Ground Model

4.2. Meteorological conditions

Fact Sheet D of the 2017 Noise Policy for Industry addresses how to account for noise-enhancing weather conditions. Two types of meteorological conditions have been defined. For day-time these are:

- Standard meteorological conditions: stability categories A-D with wind speeds up to 0.5 m/s at 10m AGL
- Noise-enhancing meteorological conditions: stability categories A-D with light winds (up to 3 m/s at 10m AGL)

If the noise enhancing meteorological conditions occur for less than 30% of the time, then the standard meteorological conditions may be adopted for the assessment.

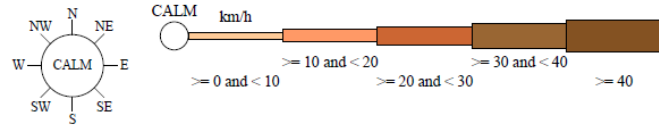
Using the methodology in Fact Sheet D2 of the Noise Policy for Industry for the eight-direction wind compass rose and data encapsulated in the annual wind roses for the Evans Head RAAF Bombing Range AWS as available for download on the website of the Bureau of Meteorology, for 9am (Figure 9) and 3pm (Figure 10)., it is determined that noise-enhancing meteorological conditions apply

For night time, several parameters need to be considered. Typically there is less wind at night than during the day in this region. In winter there can be temperature inversion at night time. Applying winter temperature inversion conditions for a summer use is not warranted. There generally is a higher humidity at night, but lower temperatures.

Based on the above, we adopt the following meteorological conditions. The Concawe meteorological model is used as it calibrates well with reality as found on other projects in the past.

Table 9 | Meteorological conditions

	Temperature, °C	Relative humidity, %	Wind speed, m/s	Wind direction	Pasquill Stability Coefficient
Day	25	60%	3	Omni-directional (worst case)	D
Evening	18	85%	2	Omni-directional (worst case)	F
Night	10	95%	0.5	Omni-directional (worst case)	G



9 am
9062 Total Observations

Calm 1%

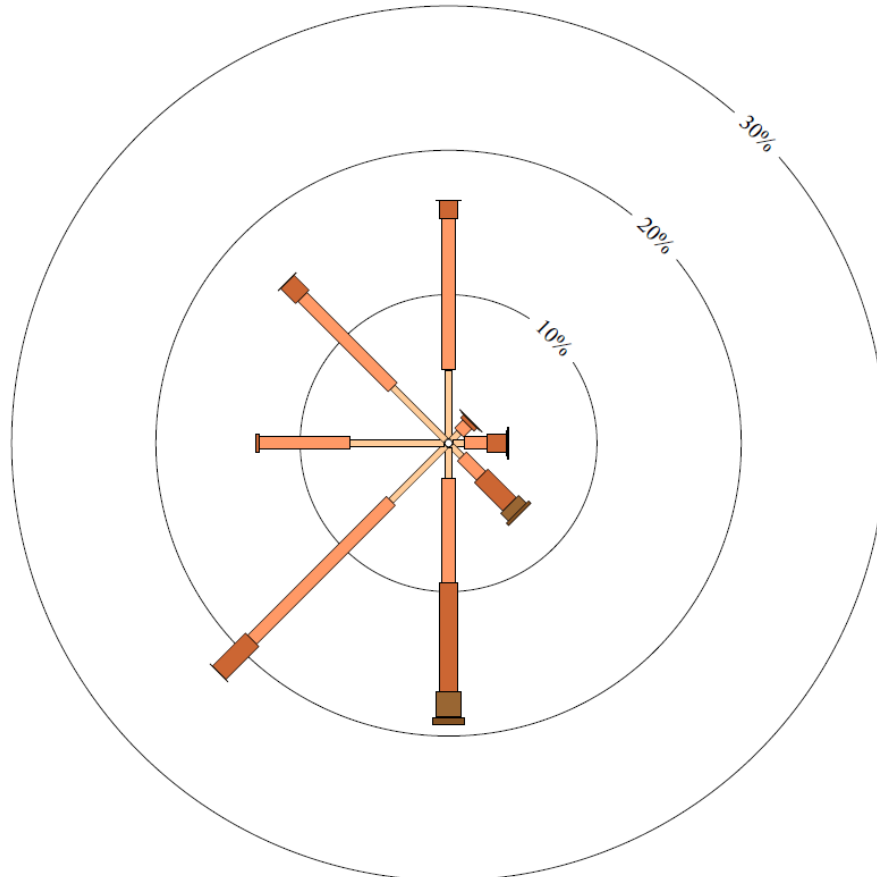
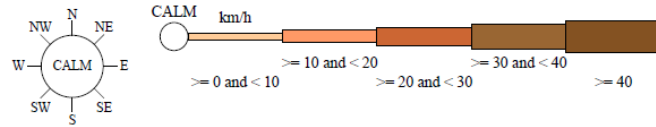


Figure 9 | Evans Head RAAF Bombing Range AWS 9am wind rose



3 pm
9078 Total Observations

Calm *

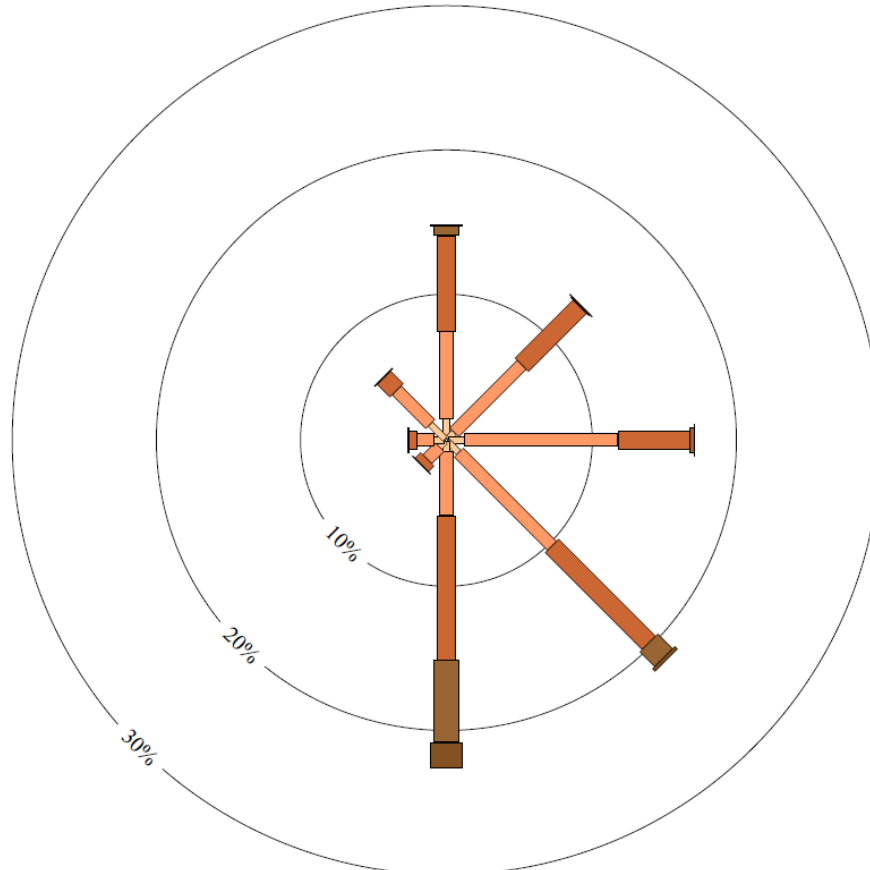


Figure 10 | Evans Head RAAF Bombing Range AWS 3pm wind rose

4.3. Noise sources

Based on the legislation referenced in chapter 2, this Noise Impact Assessment should address the following noise sources:

- Mechanical sources: air conditioning systems, and a kitchen extraction fan, all located in the rooftop services area. Adopted sound power levels: kitchen exhaust – 79.3 dB(A), A/C condensers: 69.6 dB(A) each based on equipment sound power data provided by Mitsubishi for the P450 YNW system. 2 of these systems assumed, subject to confirmation by mechanical consultant.
- Music: not required as it is not proposed to have amplified music or live music anywhere on site.

- Patron noise: groups of 4 people on all balconies and outdoor café seating area. The rooftop viewing area will be modelled using a group of six people..
- Vehicle noise: all on-site vehicle noise will be within a covered and walled car parking area and is therefore not warranted to be included in the model.

Voices – patrons and residents

Modelling of people noise (the voices of patrons of the café and residents using the balconies of the apartments) is for well-behaved people with normal speech effort. People noise has been modelled based on the findings of the following publication:

Prediction of Noise from Small to Medium Sized Crowds, Hyane et al, 2011.

The authors of this publication have investigated factors such as Lombard effect, crowd size, orientation of individuals within the crowd, and their impact on the sound power level of crowds up to 100 people in outdoor spaces. With *N* being the number of people in the crowd, the paper provides the following approximations of sound power levels of crowds:

$$L_{WAeq} = 15 \times \text{Log } N + 64 \text{ dB(A)}$$

The result sound power levels per group size are implemented as follows:

Table 10 | Group size sound power levels

N	2	3	4	6	8	10	12	14	16
L _{WAeq} , dB	68.5	71.2	73.0	75.7	77.5	79.0	80.2	81.2	82.1

4.4. Results

The single point modelling results are provided below in Table 11.

Table 11 | Single point modelling results

Receiver	Day		Evening		Night	
	PTNL	L _{Aeq,15min}	PTNL	L _{Aeq,15min}	PTNL	L _{Aeq,15min}
R1	46.4	45.3	40.5	45.4	39.6	25.9
R2 – FF	46.1	41.1	43	41.1	38	16.0
R2 - GF	46.1	41.6	43	41.6	38	14.3
R3	46.1	27.7	43	27.1	38	11.0
R4	46.8	36.5	43	36.3	38	20.5

R5	46.8	35.5	43	35.5	38	21.7
R6 – FF	46.8	46.5	43	46.5	38	31.3
R6 - GF	46.8	46.5	43	46.5	38	27.4

The single point modelling results show compliance with the PTNL's, subject to the following provisions which were incorporated in the modelling:

1. No al-fresco dining in Elm Street

The exceedances recorded are primarily due to the use of the apartment balconies by their residents. The following should be considered when assessing these outcomes:

1. The model is a worst-case scenario, where all residents are using their balconies at the same time. This is a very unlikely situation to occur.
2. The impact of the use of balconies will only be heard by residents in other properties that are also outside and who are therefore creating the same type of noise that the development is emitting. The new Elm Street apartments also have balconies that would emit the same noise type to the subject site (see Figure 11).

On the basis of these factors we consider the exceedances caused by balcony use a non-issue for this development and should not inhibit approval of this development.



Figure 11 | New Elm Street development

It should also be noted that the al-fresco is proposed to be operated from 6am, which is prior to the day period which commences at 7am Monday-Saturday and at 8am on Sundays and public holidays. Thus, the operation of the al-fresco from 6am falls in the shoulder period. During this time the background levels will be elevated with respect to the night time RBL. Given the al-fresco would only face the temporary Evans Head Village, this is unlikely to create offensive noise.

The grid noise map results (1.5m height above ground level, 10m grid cell size) are shown in the figures below.

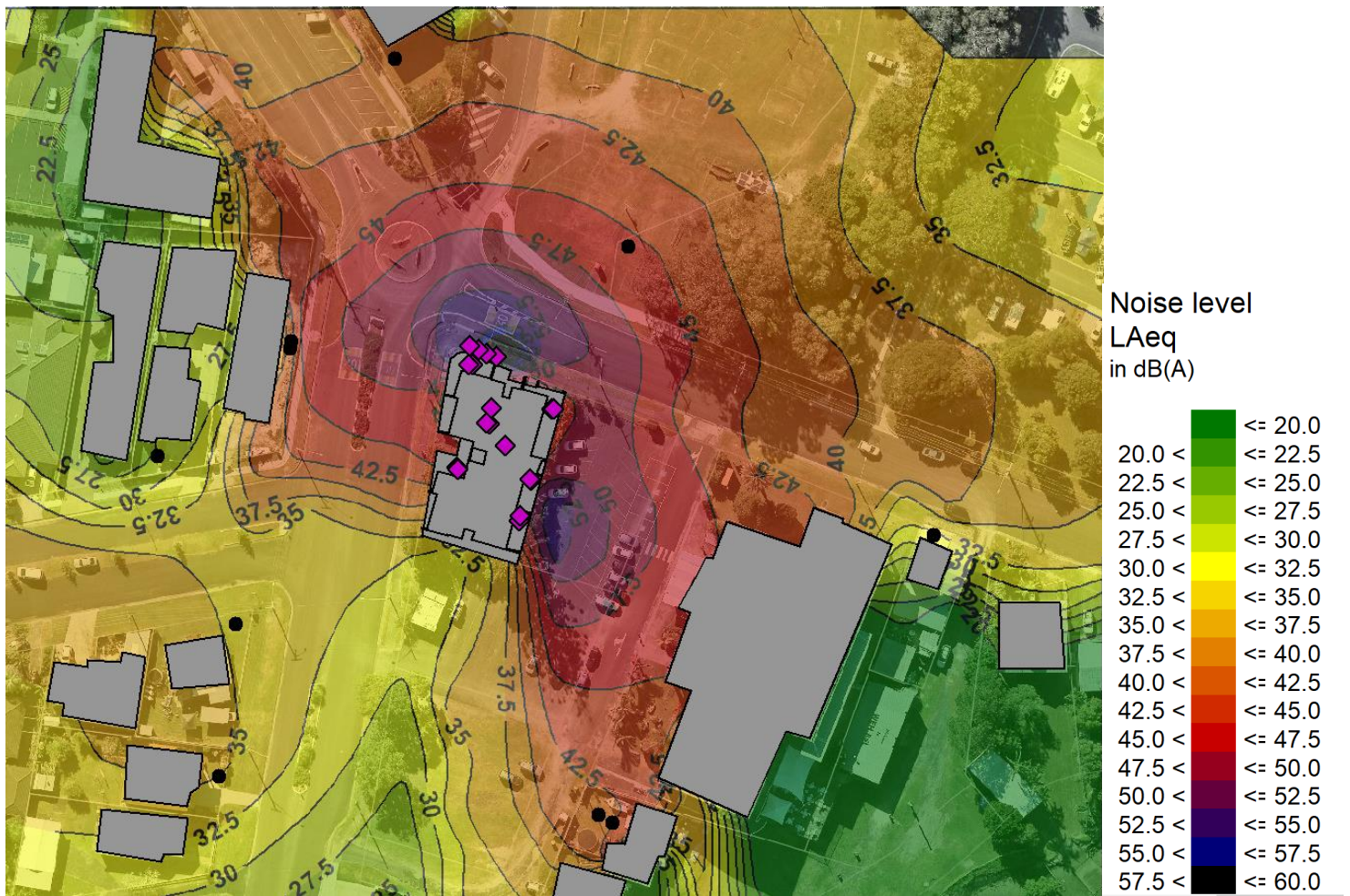


Figure 12 | Day time grid noise map

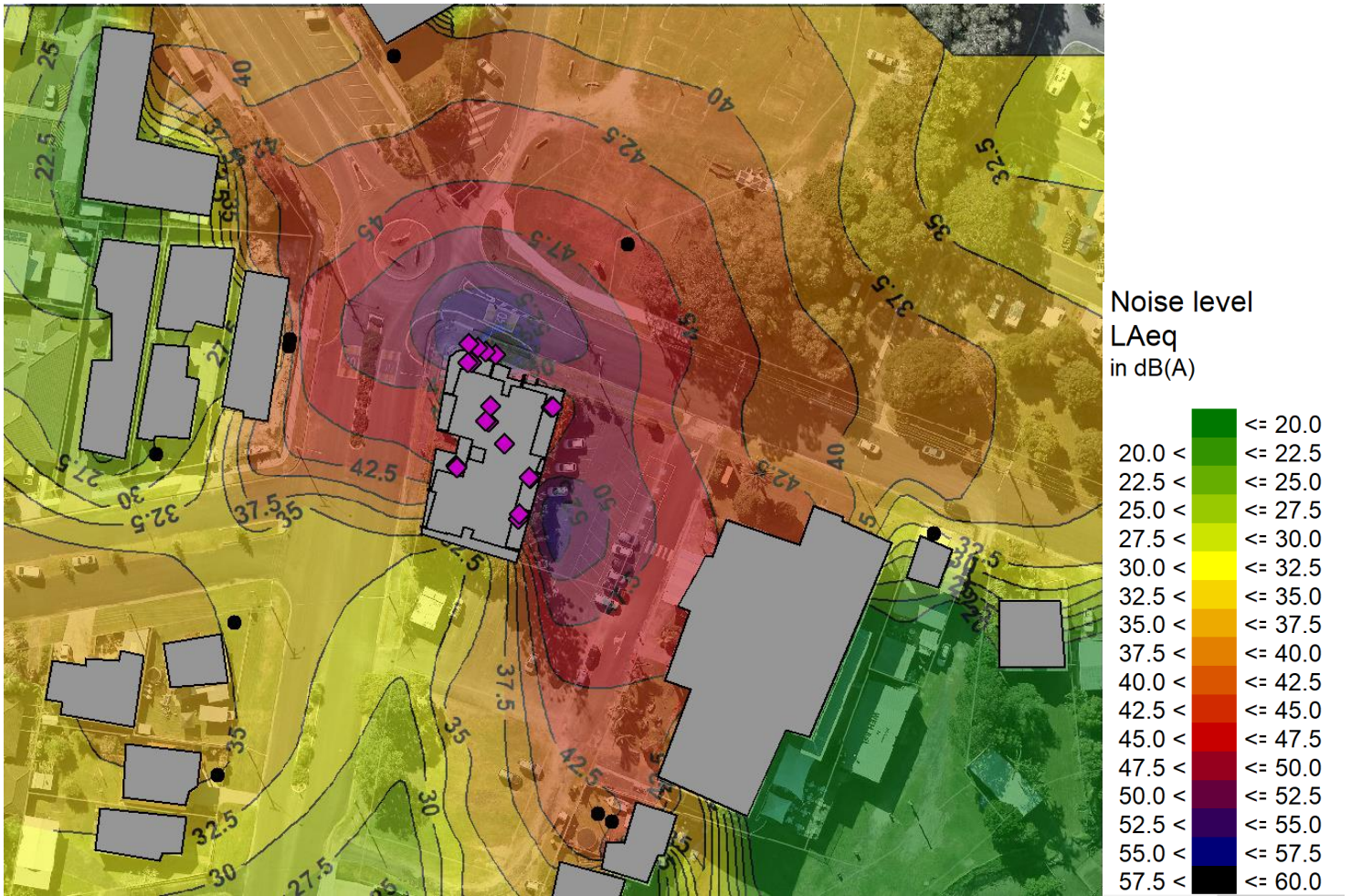


Figure 13 | Evening grid noise map

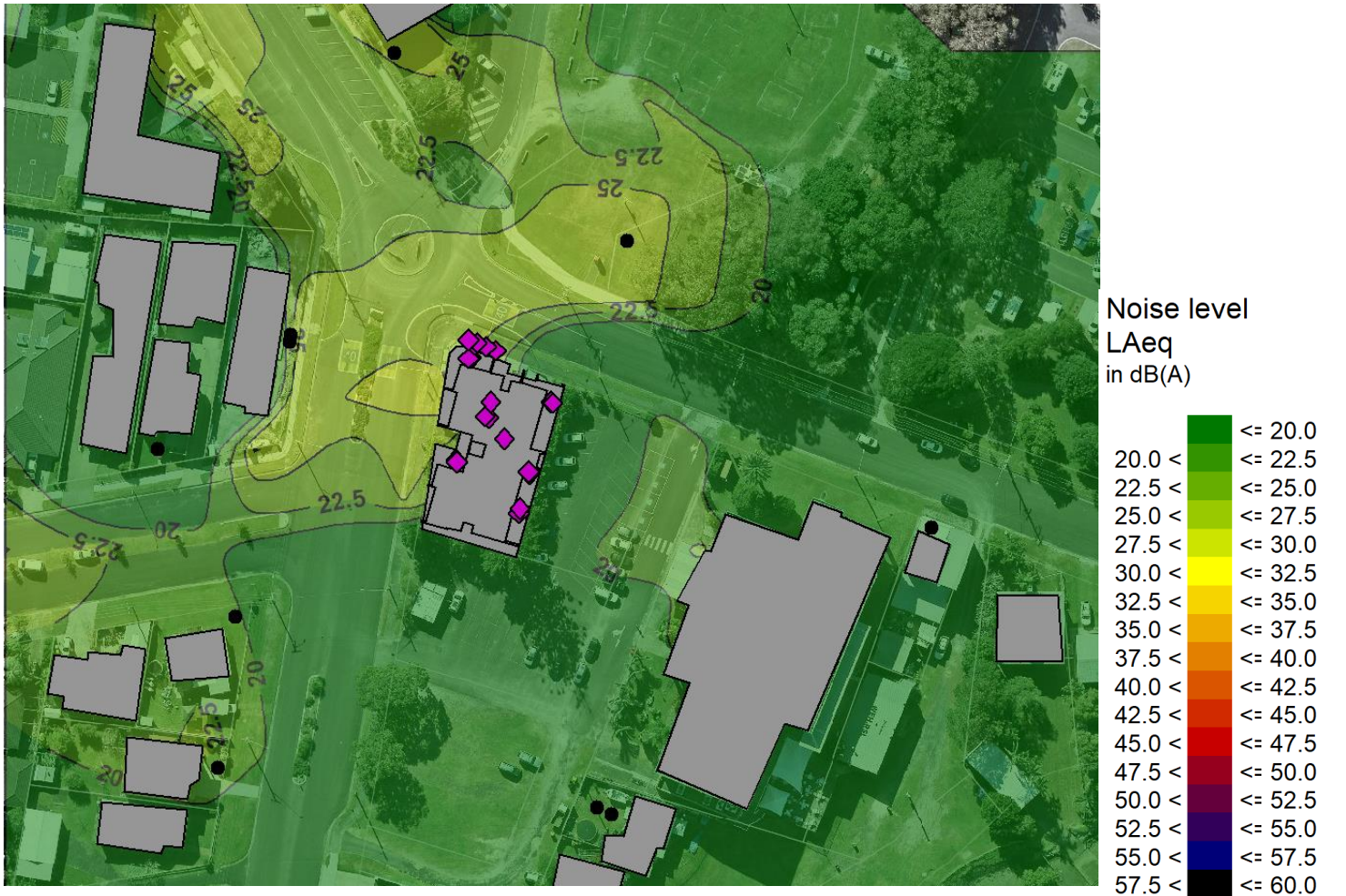


Figure 14 | Night time grid noise map

5. NOISE GENERATED BY OTHERS

Council staff requested that we assess the noise impact of the 'return and earn' facility and the RSL car park on future residents at the subject site. This is assessed in this chapter.

5.1. Assessment method

The impact of the RSL car park and 'return and earn' facility can be assessed by determining if it is likely that 'offensive noise' will be generated with respect to future residents at the subject site. As described in section 2.2 of this report, 'offensive noise' is defined by the POEO act and is considered using a number of parameters. To assist with this analysis, we carried out attended testing on site to assist with issues such as maximum sound levels, and frequency of occurrence.

5.2. Return & Earn

The attended noise test with file name 'Project 002' was carried out specifically to test the noise impacts of the return and earn facility. The return and earn was being used for roughly the first 10 minutes of this 15-minute noise test. Both cans and bottles were deposited in that facility during this time. The noise logger was set up close to the southern property boundary to accurately represent the location of a future worst-affected receiver.

The log graph for this noise test is shown in Figure 15. The light blue marker named 'Other' was used as marker representing the return and earn. These periods have a black diagonal hatch to highlight when this was relevant.

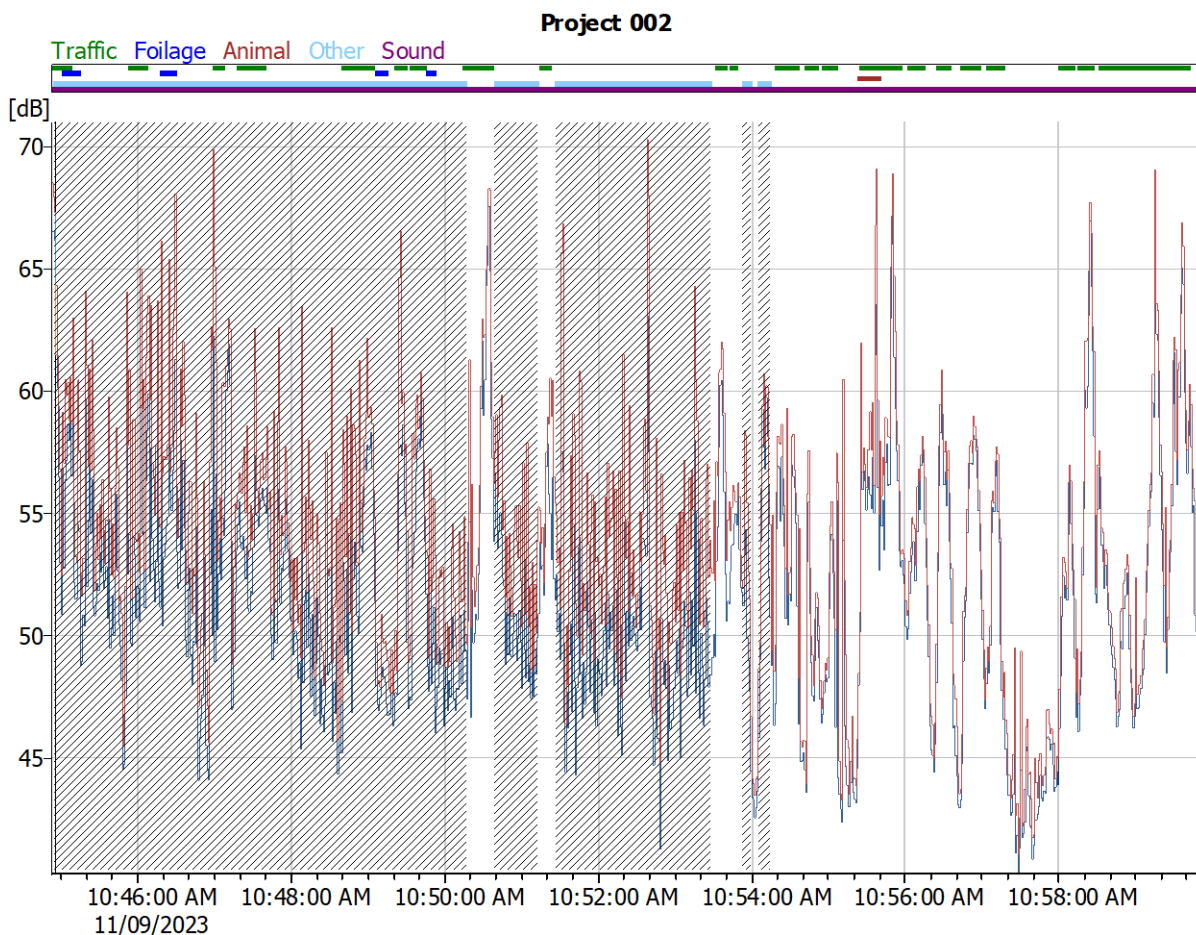


Figure 15 | Return and Earn noise

A first comparison can be made by calculating key testing values with and without the return and earn operating. This is done in Table 12. This analysis shows there is no notable increase in noise levels at the site due to the return and earn. The $L_{Aeq,T}$ value does not alter much with or without the return and earn and the L_{Amax} levels how the maximum noise levels due to bottles dropping in are of a similar order of magnitude as other maximum noise levels, such as birds, foliage and traffic at the site.

Table 12 | Testing summary

Parameter	Without Return and Earn	With Return and Earn
L_{A90} , dB	44.0	45.0
$L_{Aeq,T}$ dB	55.7	54.7
L_{Amax} , dB	69.1	70.3

The offensive noise assessment factors from Table 19 of the 2023 NGLG are addressed below in tabular form.

Table 13 | Return and Earn offensive noise checklist

Parameter	Assessment
Level	Similar noise level as other existing ambient noise sources
Duration	The individual noises are of short duration, but a user is typically there for a duration between 1 and 10 minutes, depending on the number of bottles and cans they have to dispense
Timing	We have only seen the Return & Earn being used during the day. We did not observe any use during the evening or at night
Character and quality	The noise is likely seen as annoying by adjacent residents. It is however pre-existing and future tenants / home owners should be aware of this.
Mitigation	The building design is such that the ground floor level facing the Return & Earn is car parking only, residents live on the first and second floor. Apartment facades facing the southern boundary are set back from the boundary and edges of balconies, therefore indoor receivers will benefit from a partial barrier effect with respect to the Return and Earn.
Harmful	The noise emissions are not likely to be harmful. There would be no sleep disturbance from this facility based on our observations. There may be annoyance for short duration for a resident sitting on the balcony during the day, but this would be dependent on the personality of the receiver.

Based on this assessment we deem the Return and Earn noise **not offensive**.

5.3. RSL at night

Council have requested we assess the potential for the generation of offensive noise from the RSL at night. During our evening and night time inspections, we observed the following noises generated by the RSL:

- RSL kitchen (voices, dishes)
- Patrons and staff leaving
- Car doors closing, car engines starting and cars driving off.

We have quantified these noises as follows. We installed a noise logger at the subject site, close to the eastern property boundary facing the RSL for a continuous logging period from 20:11 to 22:41. We used another hand held sound level meter do carry out background survey at the other locations as described in section 3.3. During those surveys we marked every instance that a noise emanated from the RSL, which allows us to listen to the audio recording of the continuous logger at that time and record sound levels. The results are tabulated below.

Table 14 | RSL noise emissions

Event number	Start time	Finish time	Description	L _{AFmax} , dB	L _{Aeq} , dB	L _{AF90} , dB
1	20:18:07	20:19:02	2 x car door, car starting and leaving (dominant)	56.9	43.3 – 55.7	43.0 – 55.2
2	20:19:55	20:20:34	Voices of leaving patrons (audible but not dominant)			
3	20:24:12	20:24:15	Kitchen (audible but not dominant)			
4	20:24:27	20:24:32	Kitchen (audible but not dominant)			
5	20:24:47	20:24:48	Kitchen (audible but not dominant)			
6	20:29:25	20:29:31	Kitchen (audible but not dominant)			
7	20:33:46	20:35:44	Car door, patron voices, car unlock beep, car starting, car idling, car driving off. (dominant)	53.4	42.1 – 51.6	41.8 – 50.5
8	20:42:18	20:42:28	Car driving off (dominant)	51.3	40.6 – 50.2	40.3 – 49.7
9	20:47:35	20:47:57	Car driving off (dominant)	53.1	39.7 – 50.6	39.3 – 51.8
10	20:48:12	20:48:15	RSL kitchen (not dominant)			
11	20:55:08	20:55:11	RSL kitchen (not dominant)			
12	20:55:17	20:55:20	RSL kitchen (not dominant)			
13	21:03:22	21:03:28	RSL kitchen (not dominant)			
14	21:20:41	21:20:46	RSL door and some voices (not dominant)			

15	21:21:39	21:22:08	RSL door and some voices (not dominant)			
16	21:22:57	21:23:01	Voices from RSL (not dominant)			
17	21:23:11	21:23:13	Voices from RLS (dominant)			
18	21:25:24	21:25:26	Voices from RSL (not dominant)			
19	22:24:32	22:24:36	Voices from RSL (not dominant)			
20	22:24:52	22:24:56	RSL kitchen (not dominant)			
21	22:30:24	22:31:06	Cars starting and driving off (dominant)	56.2	43.2 – 55.5	42.4 – 55.0

In Table 14 we have provided noise level ranges for sound emissions where the RSL was the dominant noise source. When comparing these to the log graphs for the recording below (showing L_{AFmax} in red and L_{Aeq} in blue) it is evident that the emitted RSL noises are in a similar range as other existing ambient noises.

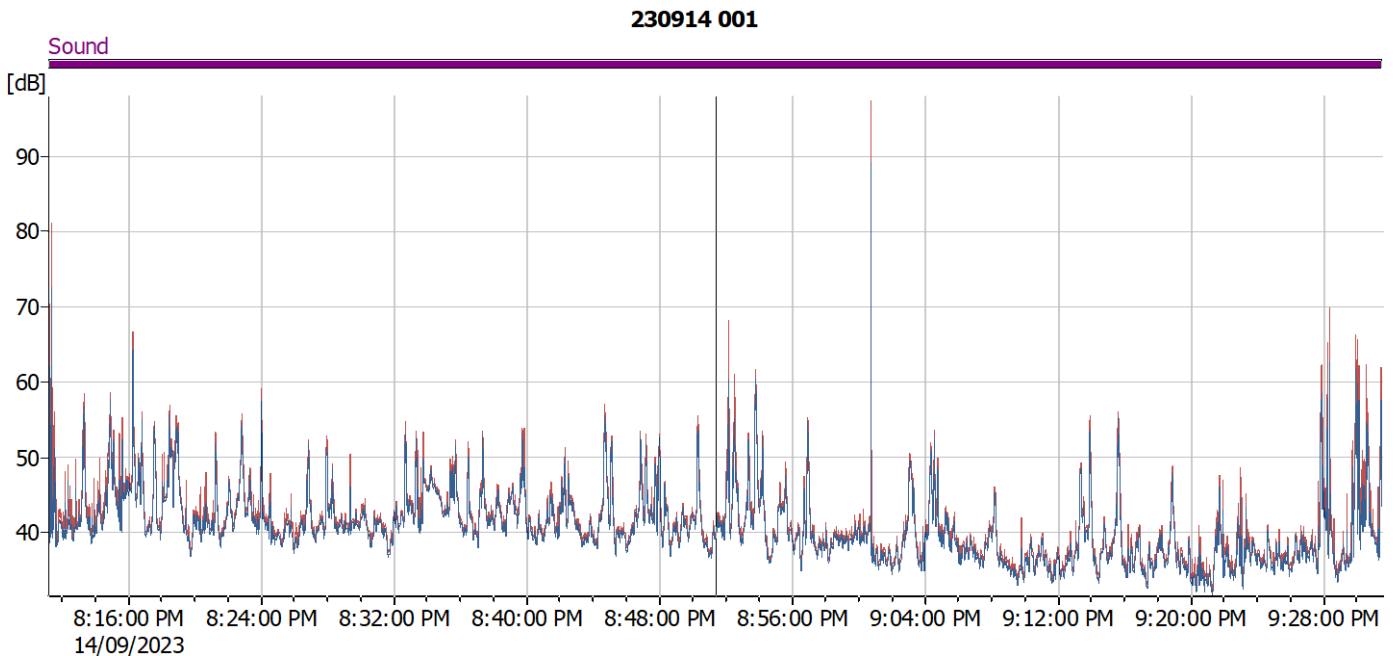


Figure 16 | Location A log graph (1/2)

230914 002

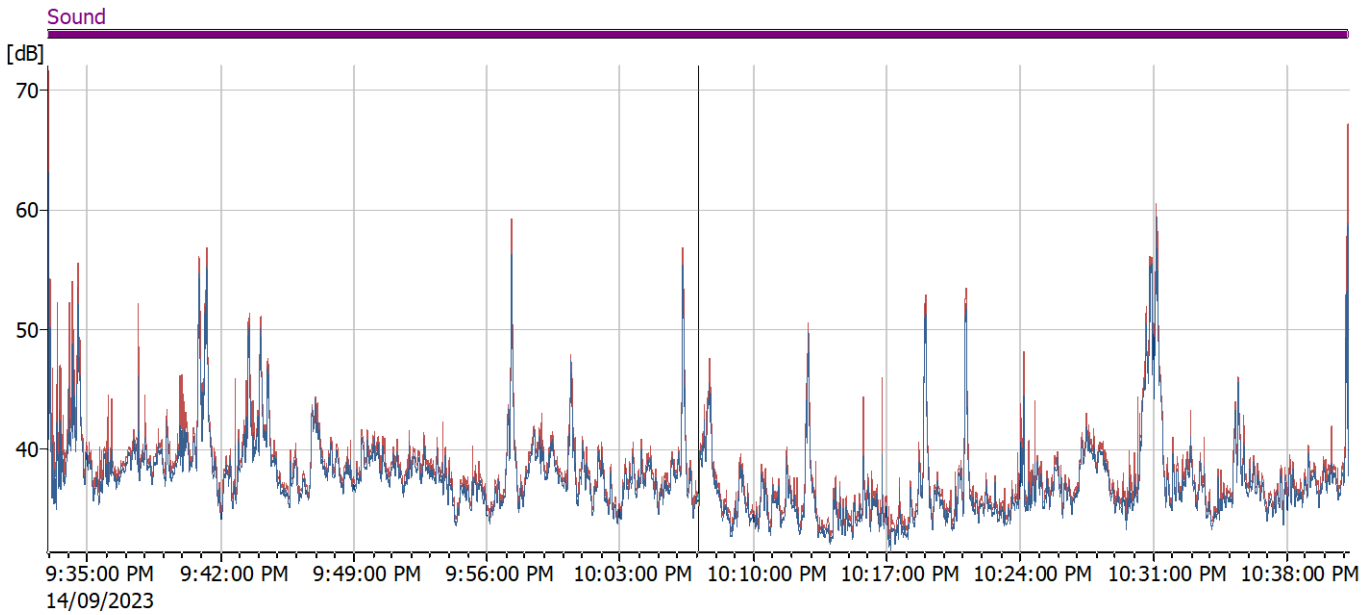


Figure 17 | Location A log graph (2/2)

We understand the RSL closing times vary between 9pm and 11pm, depending on the day of the week and which events are on.

The offensive noise assessment factors from Table 19 of the 2023 NGLG are addressed below in tabular form.

Table 15 | RSL offensive noise checklist

Parameter	Assessment
Level	Similar noise level as other existing ambient noise sources
Duration	The individual noises are of short duration
Timing	Until approximately 11pm
Character and quality	Car park noise and people noise is typical of the area since this residential zone is close to the commercial zone in Woodburn Street. The RSL is existing and future residents of this proposal will be aware of the potential for noises from the car park.
Mitigation	The building design is such that the ground floor level facing the Return & Earn is car parking only, residents live on the first and second floor. Apartment facades facing the southern boundary are set back from the boundary and edges of balconies, therefore indoor receivers will benefit from a partial barrier effect with

	respect to the RSL car park, in particular with respect to car spaces close to the property boundary.
Harmful	The noise emissions are not likely to be harmful.

Based on this assessment we deem the RSL noise emissions **not offensive**.

6. CONCLUSIONS AND RECOMMENDATIONS

The noise impact of the proposed development results in sound pressure levels at adjacent receivers that are compliant with the relevant Project Noise Trigger Level, provided conditions outlined in this report are followed. This includes that the AI-fresco should be limited to McDonald Place – no al-fresco on Elm Street footpath

The night time use of the adjacent RSL club and the use of the Return and Earn facility in the RSL car park are unlikely to generate offensive noise at the apartments included in this proposed development.

Based on our assessment, we recommend this proposal is approved from an acoustic perspective.

REFERENCES

Noise Policy for Industry, NSW Environment Protection Authority, Sydney, October 2017

Noise Guide for Local Government, NSW Environment Protection Authority, Sydney, May 2013

Australian/New Zealand Standard 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors, Standards Australia, October 2016

Australian Standard Acoustics 3671-1989 Road traffic noise intrusion – building siting and construction, Standards Australia, Homebush, NSW, 1989

Prediction of Noise from Small to Medium Sized Crowds, M.J. Hyane, J.C. Taylor, R.H. Rumble and D.J. Mee, Paper Number 133, Proceedings of Acoustics 2011, 2-4 November 2011, Gold Coast, Australia.