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Bureau SRH Pty Limited

4 Minna Close, Belrose, NSW, 2085

Noise Impact Assessment

20E-22-0008-TRP-38122-0

26 July 2022

Job Title:	4 Minna Close, Belrose, NSW, 2085
Report Title:	Noise Impact Assessment
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Prepared For:	**Prepared By:**
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Rev. 00	Original issue	26 Jul 22	

Executive Summary

Vipac Engineers and Scientists Ltd. (Vipac) was commissioned by Bureau SRH Pty Ltd to provide an Operational Noise Impact Assessment for the proposed bottling plant development located at 4 Minna Close, Belrose,l NSW 2142.

The following references were used in this assessment.

- Environmental Protection Authority (EPA) NSW Industrial Policy for Industry (NPfI), October 2017;
- NSW Road Noise Policy (RNP);
- Australian Standard AS 1055-1997- "*Acoustics Description and Measurement of Environmental Noise, Part 1- General Procedure*".
- Northern Beaches DCP: Warringah Development Control Plan 2011 (DCP).
- Architectural drawings in Table 2-1

Vipac has conducted an operational noise impact assessment for a proposed bottling plant development located at 4 Minna Close, Belrose. Based on predicted noise levels and an assessment using relevant New South Wales environmental noise criteria, the proposed development is expected to comply with noise requirements, provided the information and assumptions in this report are implemented. No additional noise controls are required for the site to comply.

Table of Contents

1 Introduction

Vipac Engineers and Scientists Ltd. (Vipac) was commissioned by Bureau SRH Pty Ltd to provide a Noise Impact Assessment for the proposed bottling plant facility located at 4 Minna Close, Belrose, NSW 2142.

2 References

The following references were used in this assessment.

- Environmental Protection Authority (EPA) NSW Industrial Policy for Industry (NPfI), October 2017;
- NSW Road Noise Policy (RNP);
- Australian Standard AS 1055-1997- "*Acoustics Description and Measurement of Environmental Noise, Part 1- General Procedure*".
- Northern Beaches DCP: Warringah Development Control Plan 2011 (DCP).
- Architectural drawings in Table 2-1

Table 2-1 : Drawings List

Drawing Name	Sheet Number	Revision	Prepared By	Dated
Basement Plan	DA100	01	Bureau Srh Architecture	6/07/2022
Ground Floor Plan	DA101	01	Bureau Srh Architecture	6/07/2022
First Floor Plan	DA102	01	Bureau Srh Architecture	6/07/2022
Roof Plan	DA103	01	Bureau Srh Architecture	6/07/2022
Elevations Sheet 01	DA200	01	Bureau Srh Architecture	6/07/2022
Elevations Sheet 02	DA201	01	Bureau Srh Architecture	6/07/2022
Sections Sheet 01	DA300	01	Bureau Srh Architecture	6/07/2022
Sections Sheet 02	DA301	01	Bureau Srh Architecture	6/07/2022

3 Project Development

3.1 Site Description

The existing site is a commercial premises which includes a two-storey commercial building and car parking with the following address and information:

- Address: 4 Minna Close, Belrose
- Lot: DP 875858 lot 502
- The site is situated within a commercially zoned area, consisting of mainly commercial and industrial developments. The surrounding buildings are made up of commercial receivers with distant residential receivers beyond roads to the north and south.
- The site is bounded by Mona Vale Road to the north and Minna Close to the south.

Figure 3-1 provides the location of the proposed development and the nearby noise sensitive receivers. Table 3-1 lists the relevant noise sensitive receivers.

Table 3-1 : Noise Sensitive Receiver Locations

Receiver	Address	Receiver Type	Orientation
C1	5 Minna Close, Belrose	Commercial	West
C2	3 Minna Close, Belrose		East
C3	1A Minna Close, Belrose		South East
C4	1 Minna Close, Belrose		South
C5	4 Narabang Way, Belrose		South West
C6	Public Parklands , Belrose		North

Figure 3-1: Site Map, Receiver Locations (C1 to C4) and Unattended Noise Logger (L) Location.

3.2 Proposed Project Description

The proposed site development will comprise the following operational information and work areas:

- Hours of operation: 0900-1700hrs, 7 days a week.
- Delivery vehicles expected per day: 2 semi-trucks and 2 small MR trucks during the Day time period between 0900-1700.
- Operational noise
    - The site will be utilised for as a bottling plant to import liquid, bottle the liquid, package bottles and export as required. There will be no liquid manufacturing on-site.
    - Forklifts operating in both internal and external areas from 0900-1700hrs.

- Worst case operating scenario assumption: 2 forklifts operating inside and 2 operating forklifts outside at all times during work hours.

- Basement level comprises:
  - 1455.84m^2 of under croft carparking for staff and visitors;
  - Total of 41 car spaces;
  - Total 3 motor bike spaces.
- Ground floor comprises:
  - 1836.68m^2 Warehouse;
  - 2 x loading docks for HRV Truck;s
  - Tanks;
  - Reception, offices and staff amenities.
- First floor comprises:
  - 627.60m^2 Research and Development areas;
  - 441.47m2 Open Plan Office;
  - 14.68m^2 x2 small offices;
  - 26.5m^2 meeting room.
- Roof: Metal sheet roof with section of translucent roofing sheets (sky lights)

The proposed site plans are provided in Figure 3-2, Figure 3-3.

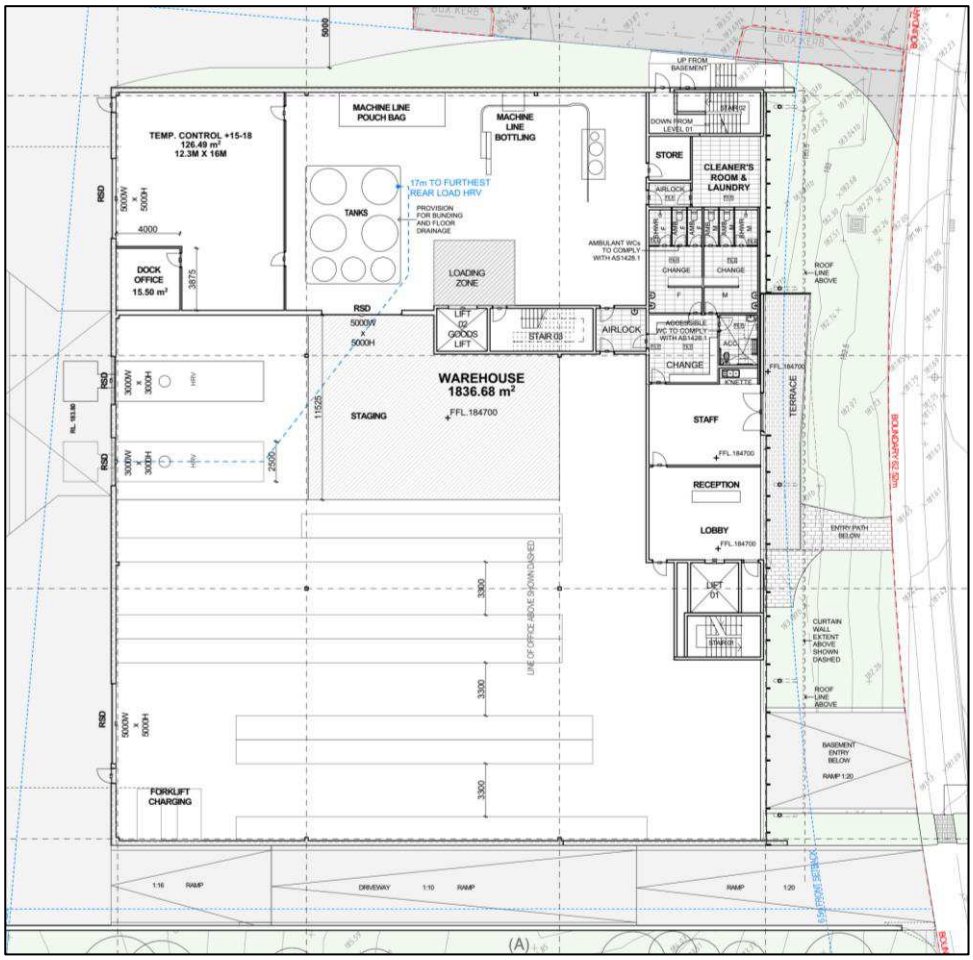

Figure 3-2: Proposed Site - Ground Floor Architectural Plans

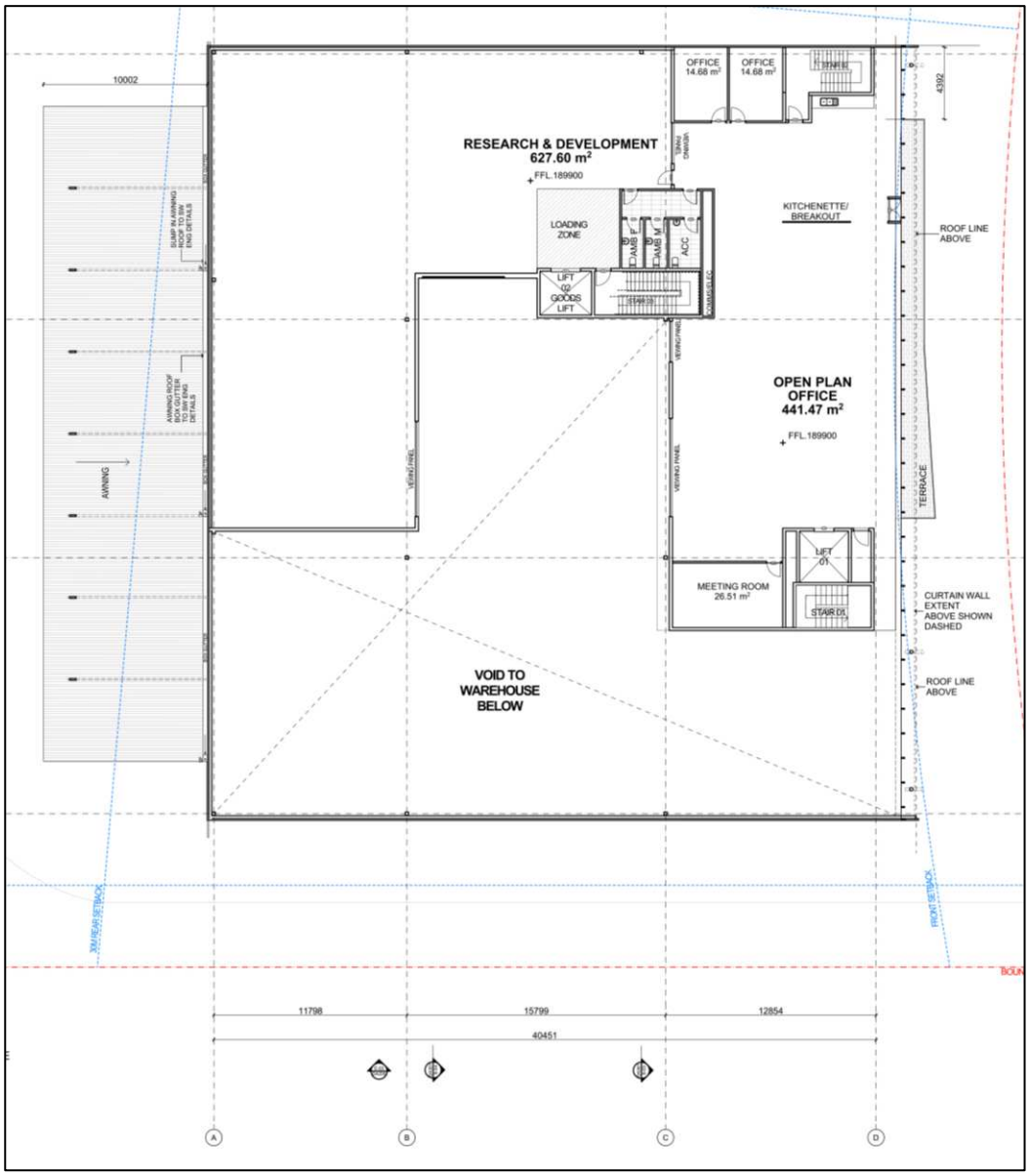

Figure 3-3: Proposed Site - First Floor Architectural Plans

4 Environmental Noise Survey

4.1 Methodology & Instrumentation

Unattended noise monitoring was conducted from 16th to 22nd July 2022 to determine the site specific noise criteria. These are outlined in this section.

According to the NSW Policy for Industry 2017, measured noise levels were processed into the following time periods:

- Daytime : 0700 – 1800 hrs;
- Evening : 1800 – 2200 hrs;
- Night-time: 2200 – 0700 hrs.

The L_{A90} noise levels are Rating Background Levels (RBLs), being the median of the background L_{A90} in each measurement period, for each 24-hour period during the noise survey.

The L_{Aeq} noise levels are the logarithmic average of all the L_{Aeq} samples taken in each of the daytime, evening and night-time periods.

Unattended noise logging was conducted in accordance with the NSW EPA's noise policy for industry using the equipment outlined in Table 4-1. The noise logger was calibrated before and after measurements and found no significant drift. Any period with extraneous weather activity has not been included in the RBL levels presented in

Table 4-2.

Table 4-1 : Noise Logging Instrumentation

Equipment	Serial Number	Calibration Due
Metravid Duo Noise Logger	10304	30/03/2024
Acoustic Calibrator	101639	26/08/2022

Table 4-2: Unattended noise monitoring results per period

Location	Time of Day	Existing $L_{Aeq\ (period)}$	RBL L_{A90}
4 Minna Close	Day	63	54
	Evening	59	49
	Night	56	47

5 Noise Criteria

5.1 NSW Noise Policy for Industry 2017

The procedures detailed in NSW NPfI have been considered to determine the limit of allowable noise emission from the proposed site for residential receivers. The assessment procedure has two requirements that must be met, namely:

Intrusiveness Criteria

The Intrusiveness Criteria is used to evaluate the extent to which a noise intrudes above the background, particularly where the receiver is a dwelling. The NPfI considers that the L_{Aeq}, 15 minute level associate with a broad-band industrial noise source may be up to 5 dB(A) above the rating background noise level (L_{A90}) at a receiver without being considered offensive.

The rating background noise level (RBL) is similar to the 10th percentile background L_{A90} however uses a different sampling technique to determine the value.

Where a noise source contains certain characteristics, such as tonality, intermittency, impulsiveness, irregularity or low-frequency dominance, correction factors may need to be applied to the noise annoyance criteria to determine the project specific criteria.

Amenity Criteria

The NSW NPfI also considers that there is a community expectation for a certain level of environmental noise amenity, depending on the type of area in which the noise sensitive receiver is located. The Industrial Noise Policy provides a table of recommended L_{Aeq} noise levels that, subject to the type of area and time of day, are considered desirable.

Depending on the level of existing industrial or commercial noise, these desirable levels are adjusted so as to require progressively more stringent amenity compliance levels. The objective of this approach is to prevent the background noise level from continually increasing as a result of each progressive new development. For an 'Urban' amenity area, the NPfI proposes that the L_{Aeq} noise level should not exceed the following acceptable noise emission levels shown in Table 5-1.

Table 5-1: Amenity Noise Criteria – Urban. NSW NPfI

Period	Time	Levels dB(A)
Daytime	0700 – 1800hrs	60
Evening	1800 – 2200hrs	50
Night-time	2200 – 0700hrs	45
Commercial	All Times	65

This policy sets out two separate noise criteria designed to ensure developments meet environmental noise objectives. The first criterion accounts for intrusive noise and the second criterion applies to protection of amenity of particular land uses. Applying both the amenity and intrusiveness criteria to the situation and adopting the more stringent of the two is used to assess the new development. This becomes the project specific noise levels. Applying the most stringent requirement as the project specific noise levels ensures that both intrusive noise is limited and the amenity is protected.

The noise criterion for commercial receiver at all time period for urban areas is 65 dB(A)

5.1.1 Project Specific Noise Emission Goals

Table 5-2 presents the project trigger noise level (PTNL) for the closest receiver.

Table 5-2: Project Trigger Noise Levels, dB(A)

Receiver Type	Time of Day	Existing $L_{Aeq\ (period)}$	RBL L_{A90}	ANL Urban $L_{Aeq\ (15\ min)}$	Intrusive $L_{Aeq\ (15\ min)}$	Amenity $L_{Aeq\ (15\ min)}$	PTNL
Residential	Day	63	54	60	59	58	**58**
	Evening	59	49	50	54	48	**48**
	Night	56	47	45	52	43	**43**
Commercial (when in use)	All	-	-	65	-	-	**65**

5.2 NSW OEH Road Noise Policy

The Road Noise Policy (RNP) addresses the issue of traffic noise from new and existing roads, and developments that generate traffic noise; and aims to reduce the road noise impact on the residents. The Policy provides noise guidelines/criteria for road related projects and methodologies to undertake a traffic noise assessment. The potential traffic noise generated from the use of the proposed development is assessed in accordance with the RNP.

Table 5-3 summarises the applicable road categories to establish the noise assessment criteria based on the type of road and the proposed land use developments.

Table 5-3: Road Noise Policy

Road Category	Type of Project / Land Use	Assessment Criteria/ Target Noise Level, dB(A)	
		Day (7am-10pm)	Night (10pm-7am)
Freeway/arterial/sub-arterial Road	2. Existing residences affected by noise from redevelopment of existing freeway/arterial/subarterial road.	L_{Aeq}, (15hour). 60 (external)	L_{Aeq}, (9 hour) 55 (external)
Local Road	5. Existing residences affected by noise from redevelopment of existing local roads	L_{Aeq}, (1hour). 55 (external)	L_{Aeq}, (1 hour) 50 (external)

As stated in Section 3.4 of the Road Noise Policy, with regard to existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use development, any increase in total traffic noise level should be limited to 2dB above that of the corresponding 'no build option'.

5.2.1 Road Noise Policy Levels

The Road Noise Policy (RNP) addresses the issue of traffic noise from new and existing roads, and developments that generate traffic noise; and aims to reduce the road noise impact on the residents. The Policy provides noise guidelines/criteria for road related projects and methodologies to undertake a traffic noise assessment. The potential traffic noise generated from the use of the proposed development is assessed in accordance with the RNP. Traffic noise values obtained from noise monitoring are presented in the following Table 5-4.

Table 5-4: Traffic Noise Measurement. dB(A).

Location	Day		Night	
	$L_{Aeq\ -\ 15hr}$	$L_{Aeq\ -\ Noisiest\ 1Hr}$	$L_{Aeq\ -\ 9hr}$	$L_{Aeq\ -\ Noisiest\ 1Hr}$
4 Minna Close	62	**65**	56	**63**

5.3 Sleep Disturbance

Activities occurring on-site during the night period have the potential to cause sleep disturbance for the nearby residents. These include activities associated with the Development after 2200hrs and before 0700hrs.

The Noise Policy for Industry states that a detailed maximum noise level assessment should be undertaken where the subject development night-time noise levels at a residential location exceed:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or;
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

The Policy does not currently provide details on how to assess sleep disturbance but makes reference to the RNP. The RNP suggests that potential sleep arousal from traffic should be assessed. The RNP has compared a number of sleep disturbance criteria and concluded the following:

- Maximum internal noise levels below 50-55 dB LAmax are unlikely to cause awakening reactions,
- One or two noise events per night, with maximum internal noise levels of 65-70dB LAmax are not likely to affect health and wellbeing significantly.

5.3.1 Project Sleep Disturbance Levels

Based on the Night-time RBL of 47 dB, the site-specific trigger levels for further assessment are specified on Table 5-5.

Table 5-5: Sleep Disturbance Specific Levels. dB(A)

Receiver Type	RBL disturbance	LAF max disturbance
Residential	52	62

6 Noise Assessment

Noise predictions were conducted using SoundPLAN noise modelling software. The use of the software and referenced modelling methodology is accepted for use in the state of NSW by NSW EPA for environmental noise modelling purposes.

6.1 Delivery Trucks & Loading Docks

Based on the information provided by The Client, the delivery/pickup trucks will drive around the building where the open roller doors are located with the 'worst case' truck schedule presented in Table 6-1 and Table 6-2. Consideration has been made for the full assessment period (as per the NPfI) and busiest 15 minute period worst case scenarios during the Day, Evening and Night time assessment periods. Note that, all roller doors are assumed to be in the open position during all times of day.

The truck volumes provided by Bureau SRH Architecture have been used throughout the calculations in this noise assessment. To predict the L_{Aeq} of a truck manoeuvre, the trucks and delivery vehicles have been modelled as moving at 10-15km/hr.

Sound power levels used for the purpose of our calculations and assessment are presented in Table 6-1 and Table 6-2.

The delivery vehicle route and loading dock/roller door opening are marked on the plans in Figure 6-1.

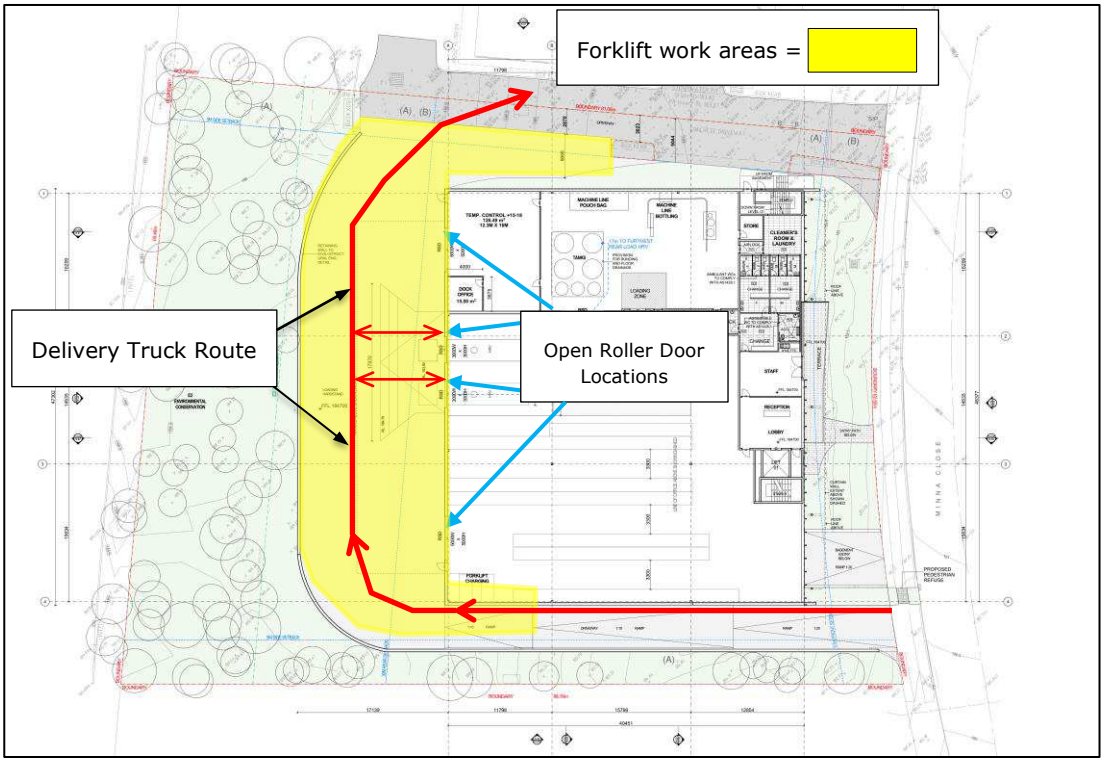

Figure 6-1: Delivery Vehicle Route, Roller Door (Loading Dock) Locations.

Table 6-1: Full Period – Worst Case Vehicles

Period	Vehicle Volumes			
	Semi Truck HVR	Small Truck MR	Forklifts working outside	Forklifts working inside
Day	2	2	2	2
Evening	0	0	0	0
Night	0	0	0	0

Table 6-2: Busiest 15 min Period – Worst case

Period Busiest 15mins	Vehicle Volumes			
	Semi	Small Truck MR	Forklifts working outside	Forklifts working inside
Day	1	1	2	2
Evening	0	0	0	0
Night	0	0	0	0

Table 6-3: Equivalent Sound Power Levels for Typical Delivery Vehicle Movements

Noise Source	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	dB(A)
13.5m truck (HRV)	101	95	94	92	94	91	88	98
19m truck (AV)	102	100	98	98	98	95	88	102
Delivery Van	99	92	76	80	78	79	71	85
Diesel Forklift (Average Work)	108	102	98	96	96	92	88	100

Table 6-4: Maximum Sound Power Levels for Typical Delivery Vehicle Movements

Noise Source	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	dB(A)
13.5m truck (HRV)	114	116	111	106	104	103	102	111
19m truck (AV)	108	98	96	104	100	98	93	105
Delivery Van	107	103	97	96	97	99	97	104

6.2 Warehouse Construction Details

The following warehouse construction details have been assumed for assessment purposes:

- An internal reverberant sound pressure level (SPLrev) of 95 dB(A) within the operational building
- All roller doors are assumed to be in the open position throughout the 'worst case' operational noise scenario.
- Four (4) forklifts are assumed to be working outside the warehouse to the north, east south and west at all times.

The 1/1 octave band transmission loss (sound insulation) of each building element within the noise model is provided in Table 6-5 for reference.

Table 6-5: Transmission Loss: Building Façade Elements

Building Element	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	Rw dB
Metal roof with insulation	-10	-14	-19	-26	-32	-39	-35	30
Concrete blockwork	-42	-44	-42	-50	-57	-63	-68	54
Door (open)	-5	-5	-5	-5	-5	-5	-5	6
Metal shed walls	-10	-13	-15	-15	-17	-21	-24	18
Louvres (non-acoustic)	-10	-10	-10	-10	-10	-10	-10	11

6.3 Noise Impact Assessment

Operational noise impacts have been predicted based on the worst case 15 minute operational scenario and have been assessed against the NPfI noise criteria to all nearby noise sensitive receivers, the results are provided in Table 6-6.

Table 6-6: Predicted Noise Levels Sensitive Receivers

Receiver	Period	Worst Case Operational Scenario		
		Predicted Noise (15 Min) dB(A)	Criteria dB(A)	Compliance
C1	When In use	59	65	✓
C2		59		✓
C3		44		✓
C4		47		✓
C5		43		✓
C6		55		✓

6.4 Sleep Disturbance

The nearest residential receivers are located over 1km to the north east and approximately 1.1km to the south of the proposed site. Due to the large distance and shielding from existing industrial tenancy buildings any noise from the site will be inaudible at the nearest residential locations. Therefore there is no need to conduct a sleep disturbance assessment.

6.5 Mechanical Plant

The final external mechanical services design, i.e. equipment selections and locations are not available at this stage. Mechanical services must be designed such that the overall noise emission from the new development complies with the noise criteria established for noise levels at the nearest noise sensitive premises in accordance with the NPfI 2017. It is envisaged that some of the control measures will require screening and/or the installation of appropriate attenuators to enable the project specific noise limits to be achieved. A review is recommended once mechanical plant selection is made to ensure noise impact internally and externally is not a concern.

6.6 Increased Traffic Noise

The final traffic noise calculations are based on the traffic and parking impact volume assumptions for typical/similar warehouse developments. The results of our calculations indicate a traffic and car parking noise emission increase in the order of + 1 to 2 dB(A) L10 at the nearest affected receivers along the boundary of the proposed development.

A + 1 to 2 dB(A) Leq noise level increase is a marginal increase and is expected to have minor impact on the existing noise sensitive receivers, therefore no further traffic or car park noise assessment is required at this time.

7 Conclusion

Vipac has conducted an operational noise impact assessment for a proposed bottling plant development located at 4 Minna Close, Belrose. Based on predicted noise levels and an assessment using relevant New South Wales environmental noise criteria, the proposed development is expected to comply with noise requirements, provided the information and assumptions in this report are implemented. No additional noise controls are required for the site to comply.

Appendix A Glossary of Terminology

Decibel, dB:

Unit of acoustic measurement. Measurements of power, pressure and intensity. Expressed in dB relative to standard reference levels.

dB (A):

Unit of acoustic measurement weighted to approximate the sensitivity of human hearing to sound frequency.

Sound Pressure Level, L_p (dB), of a sound:

20 times the logarithm to the base 10 of the ratio of the r.m.s. sound pressure to the reference sound pressure of 20 micro Pascals. Sound pressure level is measured using a microphone and a sound level meter, and varies with distance from the source and the environment.

Sound Power Level, L_W (dB), of a source:

10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 Pico Watt. Sound power level cannot be directly measured using a microphone. Sound power level does not change with distance. The sound power level of a machine may vary depending on the actual operating load.

Ambient Sound:

Of an environment: the all-encompassing sound associated with that environment, being a composite of sounds from many sources, near and far.

Background noise:

The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed.

Percentile Level - L_{90}, L_{10}, etc:

A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, e.g. L_{90} is the level which is exceeded for 90% of a measurement period. L_{90} is commonly referred to as the "background" sound level.

$L_{AEQ,T}$:

Equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.

Rating Background Level – RBL:

Method for determining the existing background noise level which involves calculating the tenth percentile from the L_{A90} measurements. This value gives the Assessment Background Noise Level (ABL). Rating Background Level is the median of the overall ABL.

Appendix B Noise Monitoring Graph

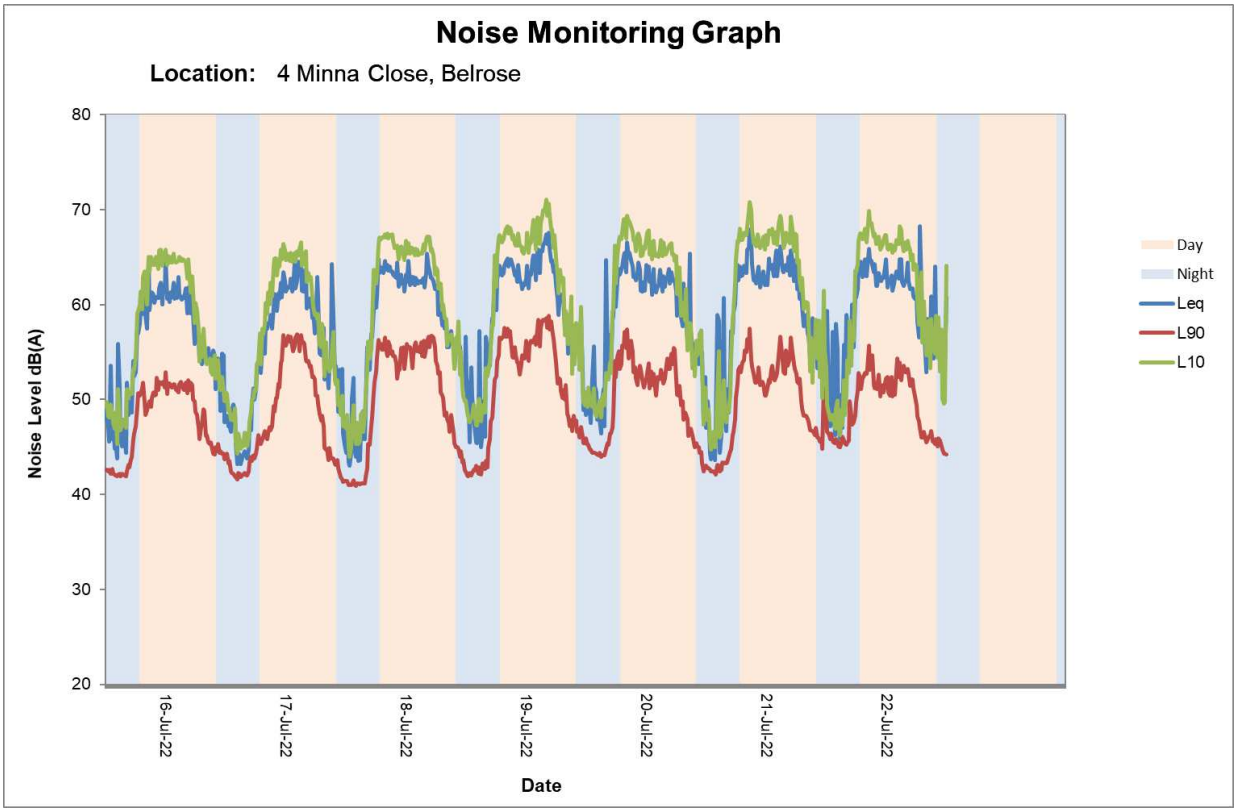

Figure 7-1: Unattended Noise Monitoring