Boral Cement Limited

Berrima Cement Works

Annual Environmental Management Review

Development Consents Addressed:	Development Consent No. 401-11-2002-i (Kiln 6) Development Consent No. 85-4-2005-i (Mill 7)
Review Period:	1 May 2024 - 30 April 2025
Approved By:	–Senior Environment Business Partner

CONTENTS

Appendices

1 ANNUAL REVIEW INFORMATION

Table 1 AEMR authorisation

Name of operation	Berrima Cement Works
Name of operator	Boral Cement Limited
Development consent no.	Development Consent No. 401-11-2002-i (Kiln 6) Development Consent No. 85-4-2005-i (Mill 7)
Name of holder of development consents	Boral Cement Limited
AEMR start date	1 May 2024
AEMR end date	30 April 2025

I, Sharon Makin, certify that this audit report is a true and accurate record of the compliance status of the Berrima Cement Works for the period 1 May 2024 to 30 April 2025 and that I am authorised to make this statement on behalf of Boral Cement Limited.

Note.

a) *The AEMR is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual $250,000.*

b) *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/ information/ documents – maximum penalty 2 years imprisonment of $22,000, or both).*

Name of authorised reporting officer	Sharon Makin
Title of authorising reporting officer	Environment Business Partner South Coast and southern Highlands
Signature of authorised reporting officer	
Date: 29 June 2025	

2 STATEMENT OF COMPLIANCE

This annual environmental management review (AEMR) summarises compliance with the following development consents applicable to the Berrima Cement Works (the Works):

- Development Consent No. DA 401-11-2002-i - approved in 2003 to upgrade and increase the capacity of Kiln 6 at the Works; and
- Development Consent No. DA 85-4-2005-i - approved in 2005 for the establishment and operation of a new cement mill (Mill 7).

It has been prepared in accordance with the *post-approval requirements for State significant mining developments Annual Review Guideline* (NSW Government 2015) (the Guideline).

The compliance status of the Works is shown in Table 2.

Table 2: Statement of compliance

Were all conditions of the relevant development consents complied with?	
Development Consent No. No. 401-11-2002-i (Kiln 6)	NO
Development Consent No. No. 85-4-2005-i (Mill 7)	YES

Table 3 summarises non-compliances with the development consents, based on the key in Table 4.

Table 3 Non-compliances

Relevant approval	Condition	Condition summary	Compliance status	Comment	Where addressed in AEMR?
Air Quality Discharge	3.10	The applicant shall install and operate equipment in line with best practice to ensure that the Development complies with all load limits, air emission limits and air quality monitoring requirements as specified in the EPL for the site.	Low	Monitoring frequency for a number of dust deposition bottles was not met due to wet weather restricting access and vandalism/theft. Twelve (12) samples are required per site. Monitoring point 11, 12 and 13 - had11 samples only Monitoring point 17 - 10 samples only This occurred over the months of May and June 2024 and March 2025. Monitoring point 11 - smashed bottle and funnel in March 2025	Section 7 Incidents and non-compliances

				Monitoring point 12 and 13 - no safe access due to flooding in June 2024 Monitoring point 17 - gauge including the stand was stolen and waiting a replacement May and June 2024 New bottles and stands have been replaced where necessary New real time ambient monitoring system now installed and in commissioning phase which will be a more accurate tool for identifying dust issues and managing from site. The current deposition gauge network will be reviewed.	

Table 4 Compliance status key for Table 3

Risk level	Code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.
Medium	Non-compliant	Non-compliance with: ● potential for serious environmental consequences, but is unlikely to occur; or ● potential for moderate environmental consequences, but is likely to occur.
Low	Non-compliant	Non-compliance with: ● potential for moderate environmental consequences, but is unlikely to occur; or ● potential for low environmental consequences, but is likely to occur.
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (eg submitting a report to government later than required under approval conditions).

3 INTRODUCTION

3.1 Overview

Boral Cement Limited (Boral Cement) operates the Berrima Cement Works located off Taylor Road, New Berrima.

The facility is located south of New Berrima in the Southern Highlands of NSW in the Wingecarribee LGA (Figure 1). Access is via Taylor Avenue, which connects the facility with the Hume Highway, approximately 2.5km to the west.

The facility is located on Boral owned land, which comprises approximately 135 ha. The area to the southeast of the Cement Works between New Berrima and Moss Vale is part of the Moss Vale Enterprise Corridor (MVEC) set aside for employment generating development under the Wingecarribee Local Environmental Plan 2010 (Wingecarribee LEP).

The closest residential zone to the works site is located in New Berrima, approximately 650m north of the No 6 kiln stack at the closest points. Residential zones are also located in New Berrima, approximately 2,150m north of the No. 6 kiln stack. New Berrima residential area is flanked to the south and east by “Private Recreation” areas.

The site is zoned Heavy Industrial (IN3). The land to the immediate east and south is zoned General Industrial (IN1).

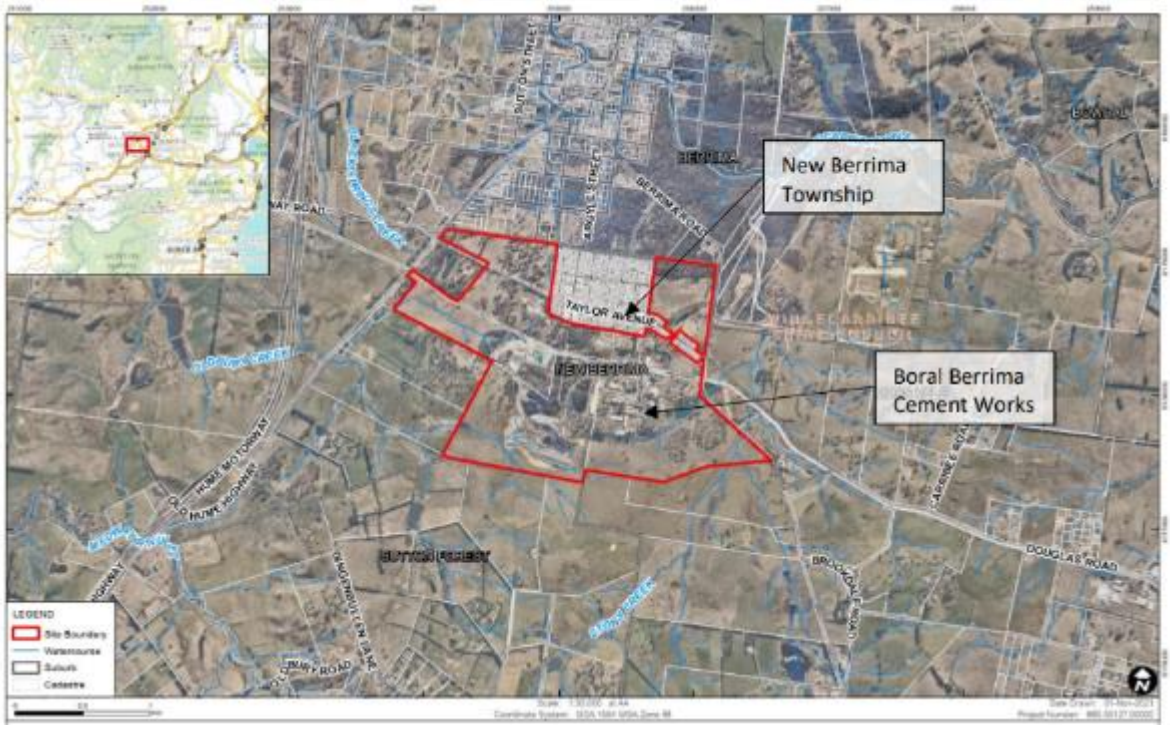


Figure 1 Berrima Cement Works Location

The Works was built in 1929 and has operated continuously ever since predominantly on the basis of continuing use rights and two development consents issued under the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).

The Works produces cement products (cement and clinker) for sale in NSW, the ACT and for export. The Works has approval to produce up to 1.56 million tonnes per annum (tpa) of cement products. Cement products are transported to domestic customers (both internal to Boral

companies, and external), by train and truck and historically to international customers through Port Kembla. Clinker is also transported to Boral Cement's Maldon Cement Works by rail which also produces cement products, including premixed dry concrete.

The Works operates 24 hours per day, 365, six days per year, including various maintenance periods.

Operational infrastructure includes one kiln (Kiln 6) and two cement mills (Mill 6 and 7), and storage and stockpiling facilities.

The main raw material inputs to the production of cement and clinker are limestone, sourced from Boral Cement's Marulan South Limestone Mine (transported via rail), and shale, sourced both on site at a shale quarry or from off-site, steel slag from BlueScope Steel in Port Kembla and granulated blast furnace slag from Bluescope Steel in Port Kembla and historically international sources.

The limestone, shale and slag are blended together, ground into a fine powder (also known as a meal) and fused at a very high temperatures (up to 1,500 degrees Celsius (˚C)) in the kiln (Kiln 6). The fused material is called clinker.

Clinker is either stored ready for reclamation or distribution to customers by road and rail transport or is mixed with gypsum and mineral addition (limestone) into one of two cement mills (Mill 6 and 7), where it is crushed to produce cement. It is then fed into cement silos from where it is despatched by either road tanker or rail tanker/wagon for delivery to Boral Cement's customers (internal Boral customers or external).

Refer to the process flow diagrams in Figure 2 and Figure 3.

Cement manufacture is an energy intensive process due to the high temperatures required for the production of clinker. Prior to the introduction solid waste derived fuels, up to 225,000 tonnes per year of coal was generally used to heat the kiln. Up until 2013 coal was sourced from the nearby Medway Colliery (also known as the Berrima Colliery) but since the colliery's closure, coal has been sourced mainly from mines in the Illawarra area. As outlined in Table 5 below the Works has approval to use standard fuels such as natural gas, fuel oil, diesel and coke fines to heat the kiln along with a number of non-standard fuels.

Table 5 Approved Kiln fuels

Fuel	Category	Tonnes Per Annum	
Natural Gas, Fuel Oil, Diesel	Standard Fuel	No Limit	
Coal	Standard Fuel	No Limit	
Coke Fines	Standard Fuel	No Limit	
HiCal50	Non-Standard Fuel	10,000	
AKF1	Non-Standard Fuel	20,000	
AKF5	Non-Standard Fuel	30,000	
Wood Waste	Non-Standard Fuel	100,000	≤ 250,000 combined
RDF	Non-Standard Fuel	200,000	
Woodchips	Standard Fuel	150 000	

SWDFs used include wood waste and refuse derived fuel (RDF) which are combustible materials recovered and processed from waste streams, such as papers, cardboards, packaging, and construction and demolition materials.

Primarily the fuel mix is made up of coal, diesel (kiln start-up), a small amount of HiCal50 (carbon anode) and SWDFs. The business will be progressively increasing its use of SWDFs and other non-standard fuels to lower its reliance on coal and to reduce the embodied carbon in its cementitious products.

Commencing in August 2018 the Works commenced the use of SWDFs, with a Proof of Performance Trial undertaken as required as per the consent. The PoPT six monthly report was approved by both the EPA and the Secretary on 23/04/2019 which permitted the continued use if SWDFs up to 40% of total fuel. During the previous reporting period, Boral continued engagement with the DPE and EPA on increasing this to the 50% approval, with approval granted on 8 December 2022.

During the previous reporting period, Boral had been granted approval to further increase the % of SWDF above 50% on the condition that Proof of Performance (PoP) trials are conducted and approved for every 10% increase over the 50%.

In the current reporting period, a PoP trial commenced in March 2025 for SWDF up to 60% total fuel mass and co-firing with AKF5.

The Works supports a direct workforce of 130 employees, a further 20 in engineering and procurement, as well as many indirect jobs in the region through logistics, contractors and suppliers.

The Works is located on a 149-hectare (ha) site immediately south of the village of New Berrima and approximately 2.5 km east of the Hume Highway. The village of New Berrima was initially developed by Boral Cement's predecessors to provide housing for employees of the Works.

The Works is the most physically dominating feature of the New Berrima area, being roughly equivalent in size to the adjacent village, with the tallest structure on the site being a pre-heater tower, which is approximately 85 m high.

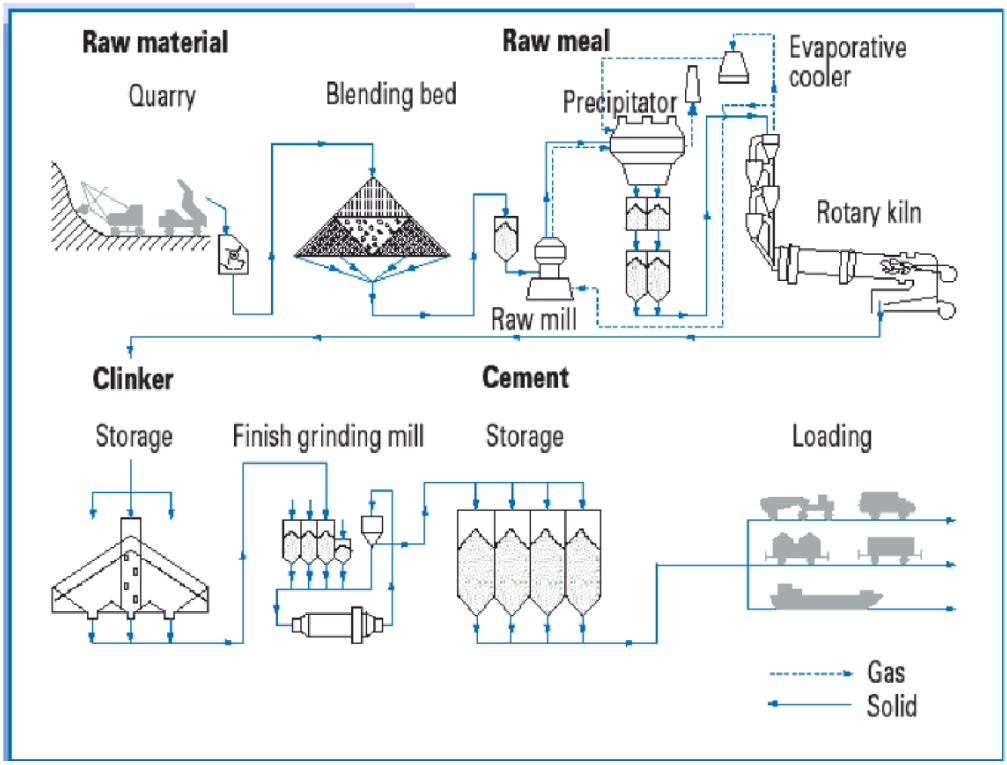
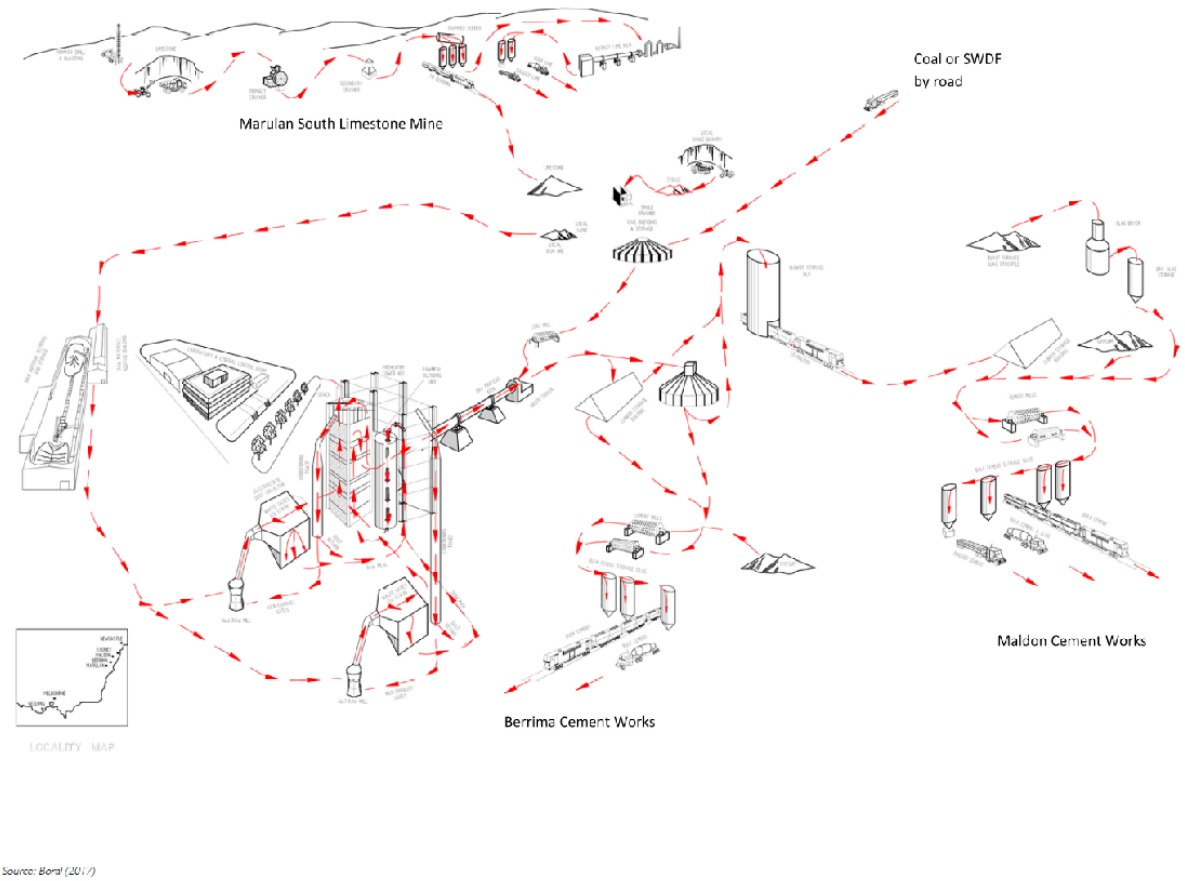


Figure 2 Process flow diagram



Source: Boral (2017)

Figure 3 Process flow diagram incorporating receipt of materials and dispatch of products

3.2 Key personnel

Details of key personnel who are responsible for environmental management at the Works are provided in Table 6.

Table 6 Key personnel responsible for environmental management

Name	Role	Phone number	Email address
Waqas Ali	Operations Manager (NSW) Boral Cement	(02) 4860 2222	Waqas.ali@boral.com.au
Greg Johnson	Senior Environmental Business Partner	0401 893 420	greg.johnson@boral.com.au
Sharon Makin	Environmental Business Partner	0401 894 185	sharon.makin@boral.com.au

3.3 Approvals

The Works operates under a combination of continuing use rights and two development consents under the EP&A Act. It also operates under an environment protection licence (EPL) issued under the NSW *Protection of the Environment Operations Act 1997* (POEO Act).

Water used at the Works is drawn from the Wingecarribee River which is regulated by five mining purpose leases (MPLs) issued under the NSW *Mining Act 1906*. In addition, one MPL regulates the provision of power to the Works.

Shale used at the Works is extracted from a quarry on the site which is regulated under a mining lease (ML) issued under the NSW *Mining Act 1992*.

3.3.1 Consents

The Works operates under a combination of continuing use rights and the following two development consents approved by the NSW Minister for Planning:

- Development Consent No. DA 401-11-2002-i - approved in 2003 to upgrade and increase the capacity of Kiln 6 at the Works; and
- Development Consent No. DA 85-4-2005-i - approved in 2005 for the establishment and operation of a new cement mill (Mill 7).

Continuing existing use rights are available to the Works given it commenced operations in 1929, before any planning approvals were required.

The development consent for Mill 7 has never been modified.

Subsequent modifications to the development consent for Kiln 6, approved by delegates of the NSW Minister for Planning, have allowed the trialling and use of certain non-standard fuels, the use of alternative 'low cost' raw materials in the manufacture of clinker (such as granulated blast furnace slag), the use of rail for coal deliveries, and the stockpiling of coal on the site. Table 7 outlines the various modifications to the development consent.

Figure 4 outlines the site and consent boundary. The consented area also includes land not currently used for operational purposes. These areas are shown in Figure 4 with the green dotting.

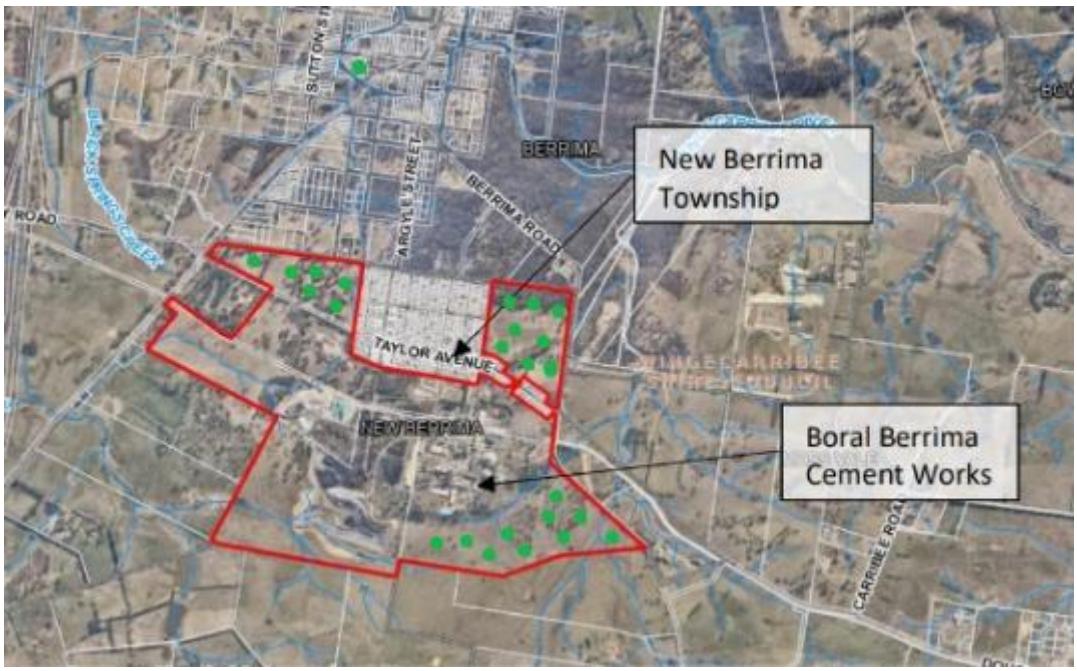


Figure 4 Consent Boundary and areas of current operational use.

Table 7 Approvals for Kiln 6

Application	Description	Date approved
DA 401-11-2002-i	Upgrade of Kiln 6 to allow for burning of non-standard fuels, installation of continuous monitoring equipment, increase in Kiln 6 output, upgrade of coal mill capacity and intermittent use of Kiln 5.	12 May 2003
MOD 1	Use of non-standard fuels, including used tyres, liquid oil residues and spent aluminium electrode carbon.	26 September 2005
MOD 2	Removal of prohibition on the acceptance of materials classified as hazardous waste under the EPA's waste guidelines.	22 September 2006
MOD 3	Small scale trial use of tyre chips over a six month period.	13 February 2007
MOD 4	Increase in usage of coal fines from 1.5 tonnes per hour (tph) to 10 tph.	8 May 2008
MOD 5	Approval to use rail for coal deliveries.	31 August 2009
MOD 6	Stockpiling of coal from Berrima Colliery for sale and transport to Port Kembla Note: As part of MOD 9, conditions relating to MOD 6 (the stockpiling of coal from Berrima Colliery for sale and transport to Port Kembla) were deleted	20 June 2012
MOD 7	Trial and use of granulated blast furnace slag as a raw material additive, not exceeding 150,000 tpa.	16 April 2012
MOD 8	Administrative changes to align consent and EPL conditions.	5 August 2012

MOD 9	The use of up to 100,000 tpa of SWDF as a non-standard fuel for Kiln 6, including the construction of a fuel storage and kiln feeding system, and the deletion of conditions relating to MOD 6.	5 October 2016
MOD 10	SWDF Fuel storage shed extension	11 April 2019
MOD 11	Use of HiCal 50 during start-up conditions	25 October 2019
MOD 12	Isotainer handling and whole of site noise limit.	7 April 2020
MOD 13	Chloride Bypass System and approval to consume wood chips sourced from fire impacted plantation forestry operations as a standard fuel.	31 May 2021
MOD 15	Construction and operation of AKF5 storage and feed infrastructure.	27 March 2023
MOD 14	Increase volume of SWDF received and used as a non-standard fuel in Kiln6, permit 24/7 delivery of SWDF, construct a new site access road and additional SWDF storage infrastructure.	28 November 2023

3.3.2 Licenses

The Works operates under EPL 1968 issued by the EPA which has been subject to numerous variations. The EPL permits the following scheduled activities listed in Schedule 1 of the POEO Act:

- cement or lime works.
- extractive activities; and
- resource recovery.

The Works also operates under a ML and six MPLs as summarised in Table 8.

Table 8 Mining leases

Mining title	Purpose	Expiry date
ML 1723	Extraction of blue shale from the quarry and rehabilitation of previously disturbed land.	18 December 2036
MPL 559	Water supply access.	20 September 2028
MPL 592	Water supply access.	20 September 2028
MPL 622	Water supply access.	20 September 2028
MPL 623	Water supply access.	20 September 2028
MPL 628	Power supply.	20 September 2028
MPL 654	Water supply access.	20 September 2028

The Annual Mining Lease Review for these licences is due annually for the previous Calendar year at the end of February. The 2024 Rehabilitation and Forward Planning reports were submitted to the Resources Regulator in January 2025.

3.4 Operations summary

Table 9 provides a summary of production at the Works for the 2023/24 reporting period (May 2023 and April 2024) compared to the previous 5 reporting periods.

Table 9 Production summary

Material	Approval limit	18/19 Reporting Period	19/20 Reporting Period	20/21 Reporting Period	21/22 Reporting Period	22/23 Reporting Period	23/24 Reporting Period	24/25 Reporting Period
Limestone used	Nil	2,008,50	1,803,196	1,803,564	1,682,298	1,674,677	1595011	1537391
Shale used	Nil	201,990	142,586	145,521	156,944	175,651	165861	137613
Slag used	Nil	113,510	129,640					116067
Other Raw Materials			153,150		194,030	427,635	413650	359275
Gypsum used	Nil	81,250	70,276					51710
Coal used	Nil	208,610	184,446	176,070	169,388	167,540	155013	110826
SWDFs used	250000 t	21,870	28,997	34,767	34,654	54,396.67	64815	99193
AKF5 used								10929
Clinker production	1,560,000 t	1,443,830	1,314,466	1,292,278	1,256,016	1,351,448	1292675	1003717
Cement production	1,560,000 t	1,209,500	1,104,195	1,043,993	1,087,963	1,104,655	1038381	983191

Coal is predominantly used as a fuel for the kiln at the Works. However, small amounts of diesel are used during kiln start-ups.

The Works is approved to produce up to 1.56 Mtpa of cement products per annum. In the 2024/25 reporting period the Works produced 1 003 717 tonnes of clinker. Of this clinker, 983 191 tonnes of cement was produced onsite. Clinker is also sent to Maldon and other customers.

Boral continued the use of SWDFs during the 2024/25 reporting period. A total of 99193T of SWDF was consumed during the reporting period which is an increase to the previous reporting period.

Commissioning of the Chloride Bypass System (CBS) associated with MOD 13 commenced in September 2023. MOD 15 was approved on 27 March 2023. Construction of the AKF5 storage infrastructure occurred mid 2023 with the addition of AKF5 to the operations commencing in November 2023, MOD 14 was approved on 28 November 2023. This approved an increased volume of SWDF received and used as a non-standard fuel in Kiln6, 24/7 delivery of SWDF, and approval to construct a new site access road and additional SWDF storage infrastructure. No Modification 14 works were commenced during the reporting period.

Discussions were held with the DPHI and EPA on the AKF5 (shredded tyre) specification. The Specification allowed only shredded tyres to be accepted from organisations who were part of the Tyre Stewardship scheme. Changes were made to the AKF5 specification allowing tyres to be sourced from approved licenced mix waste resource recovery facilities following procedural reviews and audits of the suppliers.

Boral has approval to use AKF1 materials such as heavy fuel oils sourced from refined oils. Discussions and approvals of procedures for the use of heavy Fuel oils have occurred over the reporting period with DPHI and the EPA. Use of AKF1 is to recommence in the next reporting period following PoP trials.

3.5 Environmental management

The Guideline requires that AEMRs focus on the environmental outcomes of a reporting period that are intended by the relevant approval. As such, this AEMR addresses the outcomes of the relevant conditions of the development consents rather than focus on management plans and monitoring data. Notwithstanding this, addressing environmental outcomes is a result of analysing monitoring data, and this has been undertaken in this AEMR, particularly for key environmental areas at the Works, including air quality and noise.

Consent Conditions 6.1 to 6.8 outline requirements for updates of CEMPs and OEMPs associated with modifications to the consent.

All plans have been prepared, updated and approved in line with the conditions except for Conditions 6.4D and 6.4E. These conditions require that various management plans associated with the OEMP be updated and approved prior to the construction of Mod 14 facilities (road and SWDF storage facility). The plans are yet to be updated and issued, with the installation works not yet planned to proceed.

Berrima Cement Works – Operational Environmental Management Plan (Boral 2018) (OEMP) and subordinate plans received their three yearly review and were revised in accordance with conditions 6.3A and 6.4A of DA 401-11-2002-i. The OEMP was submitted to DPE for approval on 5 April 2018 and received approval in a letter dated 21 May 2018.

Boral undertook a review of the OEMP, and the sites Air Quality Management Plan & Noise Management Plan in April 2020 to reflect the recent Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020.

The OEMP was determined to be fit for purpose for MOD 13 as operations are generally still in accordance with the associated plans. Condition 6.1, 6.1A and 6.1B required the CEMP to be updated to reflect the requirements of MOD 13. The MOD 13 CEMP was approved on 24 February 2022.

A Mod 15 CEMP was prepared and approved by DPE on the 15th May 2023.

The Mod 15 OEMP was prepared and approved by DPE on the 27th July 2023.

A revised OEMP incorporating changes for the AKF5 specification, Mod 14 and AKF1 management was issued to DPHI for approval in May 2025.

A copy of the current OEMP is available on the Boral Berrima Cement website along with the approval letter from the Department of Planning, Industry and the Environment.

https://www.boral.com.au/locations/boral-cement-works-berrima

4 ACTIONS REQUIRED FROM PREVIOUS AEMR

The 2023/24 AEMR was submitted to the DPIE on 30th June 2024. The Department considered that the Annual Report generally satisfied Conditions 7.3 and 6.3 of the approvals.

Note: The approval of the Annual Report by the Department is not an endorsement of the compliance status of the project.

Table 10 Identified Actions from Previous AEMR 2023/24

Action required from previous AEMRs	Action taken
Review and update the OEMP in line with Modification 14 Approval	OEMP was updated to reflect Mod 14 conditions and operations. This was issued to the DPHI in May 2025 for approval.
Implement other Modification 14 approval requirements to allow installation of new road and SWDF storage infrastructure a, when required	An extension of time for the installation of the road was requested and granted by DPHI when MOD 14 was approved. No works have commenced.
Progress installation and operation of real time dust monitoring and alert system	The real time dust monitoring system was installed by December 2024, with a TARP and alert system being trialled.

5 ENVIRONMENTAL PERFORMANCE

5.1 Overview

This section reports performance against the environmental performance conditions in Development Consent No. 401-11-2002-i (Kiln 6) and Development Consent No. 85-4-2005-i (Mill 7). It is divided into sections based on the environmental matters in the consents and comprises a conditions table and Boral's reporting against the conditions.

5.2 Noise

The consent requirements for noise for Kiln 6 are in conditions 3.1 to 3.6 of Development Consent No. 401-11-2002-i and for Mill 7 in conditions 2.1 to 2.6 of Development Consent No. 85-4-2005-i, which are replicated in Table 11. Noise was monitored and reported against the Kiln 6 and Mill 7 contribution criteria in December 2024 (see Appendix A – Boral *Cement Berrima - Annual Environment Noise Assessment, December 2024,).*

Performance against the Consent Requirements are described in Table 12.

During the reporting period, the site received 1 complaint relating to noise. The site had been on limited operations due to the weekend with no additional noise sources. Operations may have been more audible due to overcast weather at the time.

Boral manages noise on site in accordance with the *Berrima Cement Works – Noise Management Plan* (Boral 2024), which describes the monitoring points, frequency and criteria.

The Executive Summary of the Annual Noise Assessment noted the following:

The Boral Cement Berrima works has a single noise limit condition for the total site, of LA90,15-minute not to exceed 58 dBA at Location 20 in the Store Yard. Monitoring for total site emissions at Location 20 over a 15 day period from 27 November to 11 December 20254 has again confirmed that total site emissions are in compliance with the licence condition, as has occurred in all annual surveys since this condition was applied in 2019. Times when that sound level limit was exceeded at the site were caused by weather conditions and extraneous sources not relevant to the compliance assessment.
Sound levels at the plant and in the residential community affected by the noise emissions from the total site have been measured regularly since 2002 and since the completion of each of the Kiln 6 Upgrade and Cement Mill No.7 projects. Monitoring of both residential receiver sound levels and site source sound levels on an annual basis since 2008 has confirmed that both of the projects were in compliance with their noise limit conditions at the time and continue to achieve their objectives.
The annual environmental noise assessment has evaluated noise emission from the Cement Plant by the following methods:
• Monitoring of sound levels at Location 20 for compliance assessment over a two-week continuous period of plant operations;
• monitoring of sound levels in one residential receiver location with unattended monitoring over the same long-term period of two weeks;
• monitoring of sound levels in the North Fence location with unattended monitoring over the same period of two weeks to provide comparisons with the residential receiver and low-frequency and potential for sleep-disturbance at night-time as required by the NSW Noise Policy for Industry;
• attended monitoring in daytime at four residential receiver locations and two site locations to compare with long-term averages from previous years and assess the audible acceptability of the received sound levels;
• listening-attended monitoring from the unattended logger recordings at 4 Melbourne St and the North Fence location during four night periods, three evening periods and two daytime periods, to identify sources contributing to the received sound levels.

The finding of this 2024 annual environmental noise assessment is that total site noise emissions are considered to be in compliance with the licence condition. The licence

condition was not exceeded at any time over the two-week monitoring period.

Sound levels from the two major completed projects (Kiln 6 Upgrade and Cement Mill No.7) are also considered to be in compliance with their noise objectives at the nearest residential receiver locations.

It is also the finding of this assessment that the long-term average statistical sound levels have not increased and indicates that the Cement Plant is not increasing its emissions.

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Table 11: Noise conditions

Number	Condition
K3.1 Noise	Construction activities associated with the cement works upgrade shall only be carried out: a) between 7:00 am and 6:00 pm, Monday to Friday inclusive, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site; b) between 7:00 am and 1:00 pm on Saturdays, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site; c) at no time on Sundays or public holidays, during periods when the cement works is shutdown, and construction noise is audible at the boundary of the site; d) at any time during periods in which the cement works is in operation; and e) at any time if construction noise is inaudible at the boundary of the site.
K3.1A	The Development shall be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009). All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the CEMP. Note: The Interim Construction Noise Guideline identifies 'particularly annoying' activities that require the addition of 5dB(A) to the predicted level before comparing to the construction NML
K3.1B	Where Feasible and Reasonable, operation noise mitigation measures shall be implemented at the start of Construction (or at other times during construction) to minimise construction noise impacts.
M2.1 Noise Impacts	Construction activities associated with the cement works upgrade shall only be carried out: a) between 7:00 am and 6:00 pm, Monday to Friday inclusive, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site; b) between 7:00 am and 1:00 pm on Saturdays, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site;

	c) at no time on Sundays or public holidays, during periods when the cement works is shut-down, and construction noise is audible at the boundary of the site; d) at any time during periods in which the cement works is in operation; and e) at any time if construction noise is inaudible at the boundary of the site.
K3.2 Operational Noise	Subject to compliance with the requirements of this consent, the cement works upgrade may be operated 24 hours per day, 7 days per week.

K3.3

Noise generated at the site must not exceed the noise limits at the times and location specified in Table 2 below.

Former Limits

Table 2 – Maximum Allowable Noise Contribution Limit (dB(A))

Receiver Location	Day[a] $L_{Aeq(15\ minute)}$	Evening[b] $L_{Aeq(15\ minute)}$	Night[c] $L_{Aeq(15\ minute)}$
4 Melbourne Street	37	37	37
Chelsey Park Farm	30	30	30
Candowie Farm	37	37	37

New Limits (MOD 12) 7 April 2020 (still current)

Table 2 – Maximum Allowable Noise Limit (dB(A))

Location	Day[a] $L_{A90(15\ minute)}$	Evening[b] $L_{A90(15\ minute)}$	Night[c] $L_{A90(15\ minute)}$
The Noise Compliance Point (Point 20) – Store Yard Close	58	58	58

a. Day is defined as the period from 7:00am to 6:00pm Monday to Saturday and 8:00am to 6:00pm on Sundays and public holidays.

b. Evening is defined as the period from 6:00pm to 10:00pm.

c. Night is defined as the period from 10:00pm to 7:00am Monday to Saturday and 10:00pm to 8:00am on Sundays and public holidays.

Note: Noise contributions specified in Table 2 are to be interpreted as contributions from the new and upgraded components forming part of cement works upgrade only and not as noise limits for the site as a whole. (Footnote: 2 Incorporates EPA General Terms of Approval (L6.1 and L6.2)

K3.3A	Any new or upgrade development projects the subject of any modification to this consent must give consideration to the Project Specific Noise Levels identified in the document titled 'PRP-7 Response – Identifying Environmental Noise Objectives For Berrima Cement Plant' dated 27 March 2018, prepared by Recognition Research.
K3.4	All vehicles associated with the isotainer loading operations at the site must use a broad-band type reversing alarm instead of tonal beeper reversing alarm.

K3.5	The locomotive of the train transporting isotainers to the site must be relocated to the eastern end of the train as soon as practically possible after arrival during daytime to avoid such movements in evening or night-time periods.
K3.6	The applicant must implement best practice technology with respect to the isotainer reach stacker to reduce LAmax noise events.
K3.6A	A Noise Verification Report must be submitted to the satisfaction of the Planning Secretary at the following stages of the development: (a) prior to the commencement of construction of the chloride bypass system for Kiln 6 (b) within three months of the commencement of operation of the chloride bypass system
K3.6B	The Noise Verification Reports required by condition 3.6A must be prepared by a suitably qualified and experienced acoustic consultant and include: (a) verification of compliance with noise limits specified in condition 3.3 in accordance with the Noise Policy for Industry (EPA, 2017) (b) a detailed analysis of annoying noise characteristics in accordance with Fact Sheet C of the Noise Policy for Industry (EPA, 2017) to confirm the plant and equipment associated with the chloride bypass system does not exhibit annoying noise characteristics
M2.1	Construction activities associated with the cement works upgrade shall only be carried out: a) between 7:00 am and 6:00 pm, Monday to Friday inclusive, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site; b) between 7:00 am and 1:00 pm on Saturdays, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site; c) at no time on Sundays or public holidays, during periods when the cement works is shut-down, and construction noise is audible at the boundary of the site; d) at any time during periods in which the cement works is in operation; and e) at any time if construction noise is inaudible at the boundary of the site.

M2.2

Subject to compliance with the requirements of this consent, the cement works upgrade may be operated 24 hours per day, 7 days per week.

M2.3

[2]The Applicant shall design, construct, operate and maintain all new and upgraded components forming part of the cement works upgrade to ensure that for each receiver location listed in Table 1 below, the noise level at each receiver location does not exceed the maximum allowable noise contribution limit at the receiver location specified.

Table 1 – Maximum Allowable Noise Contribution Limit (dB(A))

Receiver Location	Day[a] $L_{Aeq(15\ minute)}$	Evening[b] $L_{Aeq(15\ minute)}$	Night[c] $L_{Aeq(15\ minute)}$
Adelaide Street, near Taylor Avenue, New Berrima	43	43	40
Argyle Street, near Taylor Avenue, New Berrima	43	43	40
Candowie Farm House	43	43	40

a. Day is defined as the period from 7.00am to 6.00pm Monday to Saturday and 8.00am to 6.00pm on Sundays and public holidays.

b. Evening is defined as the period from 6.00pm to 10.00pm.

c. Night is defined as the period from 10.00[pm to 7.00am Monday to Saturday and 10.00pm to 8.00am on Sundays and public holidays.

Note: Noise contributions specified in Table 1 are to be interpreted as contributions from the new and upgraded components forming part of cement works upgrade only and not as noise limits for the site as a whole. (Footnote: 2 Incorporates EPA General Terms of Approval (L4.1 and L4.2))

M2.4

[3]The maximum allowable noise contributions identified in condition 2.3 apply under all meteorological conditions, except:

a) during wind speeds greater than 3ms-1 measured at 10 metres above ground level; or

b) during temperature inversion conditions of greater than 3oC/100m and wind speeds of greater than 2ms-1 measured at 10 metres above ground.

(Footnote: 3 Incorporates an EPA General Term of Approval (L4.4))

M2.5

[4]For the purpose of assessment of noise contributions specified under condition 2.3, noise from the cement works upgrade shall be:

	a) measured at the most affected point on or within the receptor site boundary or at the most affected point within 30m of the dwelling (rural situations), where the dwelling is more than 30m from the property boundary; and b) where applicable, subject to the modification factors provided in Section 4 of the New South Wales Industrial Noise Policy (EPA, 2000). (Footnote: 4 Incorporates an EPA General Term of Approval (L4.3))
M2.6	Notwithstanding condition 2.5 of this consent, should direct measurement of noise from the site be impractical, the Applicant may employ an alternative noise assessment method deemed acceptable by the EPA (refer to Section 11 of the New South Wales Industrial Noise Policy (EPA, 2000)). Details of such an alternative noise assessment method accepted by the EPA shall be submitted to the Director-General prior to the implementation of the assessment method.

Note: (K = Kiln 6, M = Mill 7)

Table 12: Response to noise conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.1	The Tyre Chip storage infrastructure was completed in 2024. All construction was undertaken during the allowed times.	Construction is a short-term activity which cannot be used to establish long-term trends. The noise verification report required under K3.6A and K3.6B was completed to provide verification of compliance prior to construction. The annual noise assessment shows construction noise was not identifiable.	A CEMP is prepared and approved by DPHI prior to new construction commencing. to address construction specific management controls. Operational staff and contractors involved in the construction were tool boxed on environmental requirements.
K3.1A	As above	As above	Section 8.4.5 of the CEMP addresses noise management and mitigation measures.
K3.1B	as above	As above	Approved CEMPs include operational noise mitigation measures which are implemented during construction where feasible,
K3.2	The noise assessment and annual monitoring demonstrated that Kiln 6 operated within the objectives required to achieve contribution criteria during the reporting period and should be allowed to continue operating 24 hours/day, 7 days/week.	Overall, the sound levels associated with Kiln 6 sources were calculated to be less than the objective at Location 20. They are also considered to not exceed the contribution objectives at the nearest residential receivers to the northern and southern sides of the plant. (refer Annual Noise assessment report)	Existing management measures effectively contain noise levels below contribution criteria.
K3.3	The noise assessment demonstrated that Kiln 6 operated within the objectives required to achieve contribution criteria at the residential locations during the reporting period.	As above	As above

K3.3A	Any new MOD must give consideration to the PSNL in the PRP dated March 2018	Assessment reports to give consideration to the PSNL	Implemented for recent modifications Noted for future modifications
K3.4	All vehicles associated with the isotainer operation must use a broad-band type reversing beeper alarm.	Broadband alarms installed. Site procedure prepared and incorporated into Noise Management Plan	Implemented
K3.5	Locomotive must be relocated to eastern end of train as soon as practical to avoid such movements at night	Site procedure prepared and incorporated into Noise Management Plan	Implemented
K3.6	Best practice technology implemented with respect to reach stacker to reduce noise events	Site procedure prepared and incorporated into Noise Management Plan. Operators trained.	Implemented
K3.6A	The verification report was finalised on 22 September 2021 prior to the commencement of construction of the CBS. . Commissioning of the CBS was undertaken from November 2023 with the noise verification monitoring undertaken on the 14th December 2023. The report has submitted to DPE and the EPA.	Operational verification report concluded that.. *"Sound levels around the CBP were found to be affected significantly by emissions from the other parts of the cement plant. This is to be expected because the noise specification sound levels for the new CBP were intended to be relatively low, compared to other sources at the plant* *Based on the two calculation methods, it is the assessment of this report that the noise emissions form the operational CBP are in compliance with the recommended objectives of the Pre-construction Verification Report"*	The final verification report concluded that noise emissions from the CBS are in compliance with the levels recommended objectives in the preconstruction Verification report.
K3.6B	The preconstruction verification report was completed by John Sleeman at SLR and is a suitably qualified acoustic consultant. The post verification report was completed by Steve Collings and Colin Tickell at Recognition Research. Both Steve and	Compliant	Compliant

	Colin are suitably qualified acoustic consultants.		
M2.1	No construction activities are occurring in areas designated with Mill 7, however limited construction continued with the Tyre Chip storage infrastructure	The CEMP controls for the Tyre Chip storage facility refer to the whole site to limit of cumulative impacts	CEMP was approved by DPIE (now DPHI) to address construction specific management controls.
M2.2	The noise assessment predicted, and monitoring confirmed that Mill 7 operated within the contribution criteria during the reporting period and should be allowed to continue operating 24 hours/day, 7 days/week.	See Appendix 1 for Noise Assessment Report	Compliant
M2.3	The noise assessment predicted that Mill 7 operated within the contribution criteria at the residential locations during the reporting period, including for the worst case weather scenario.	See Appendix 1 for Noise Assessment Report	Compliant
M2.4	Monitoring has shown compliance with limits.	See Appendix 1 for Noise Assessment Report	Compliant
M2.5	Noise was measured at the following locations: ● 72 Taylor Avenue (near Adelaide St); ● 12 Brisbane Street; ● 4 Melbourne Street; ● Northern Boundary; and ● Store Yard (close).	See Appendix 1 for Noise Assessment Report	Compliant

M2.6	Section 11 of the INP provides the following alternate methods for determining compliance: 1. measuring existing noise levels with and without the premises operating. 2. measuring the noise emissions from each of the premises at reference locations and then calculating the noise-emission levels back to the receiver; and 3. using an accepted noise model calibrated for the particular locality and source. Method 2 was used for Mill 7.	This method has been used in previous AEMRs for the site with the results accepted by DP&E. (now DPHI)	No management measures required.

Note: (K = Kiln 6, M = Mill 7)

5.3 Air quality

Boral Cement is acutely aware that elevated fugitive dust emissions from the site can occur and to combat this has active dust management controls in place as set out in the *Berrima Cement Works – Dust Management Plan* (Boral 2023), which is operated across the site.

During the reporting period, a Pollution Reduction program for the establishment and implementation of an ambient air quality monitoring system was agreed with the EPA.

Four new monitors (see Figure 5) were installed prior to December 2024 with a web-based data and alert system implemented. The system is currently being reviewed to ensure the Trigger Action responses to alert levels are appropriate.

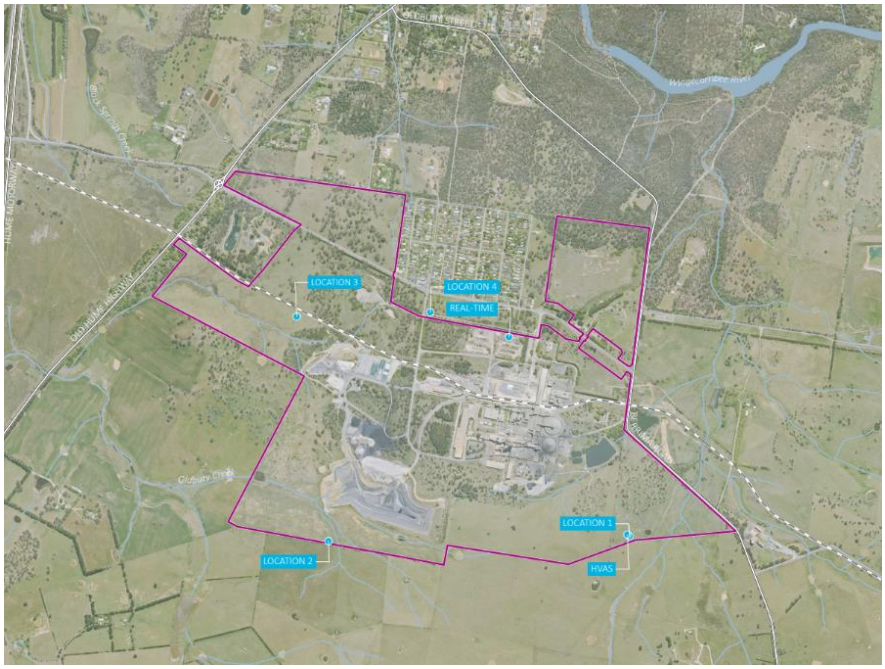


Figure 5 Location of ambient air quality real time monitors

Table 13 sets out the relevant air quality conditions for the site within the two development consents. Table 14 sets out the site's performance during the past year relating to air quality and the key management measures that are used to minimise dust being generated and leaving the site which include:

- controlling dust from stockpiles using methods including the compaction of stockpile batters (being pushed up with a loader), wetting down with a water cart in dry weather conditions and stopping loading/unloading operations in high winds;
- controlling vehicles (ensuring they are covered and have used wheel washes for example);
- revegetating areas and planting trees to act as wind breaks;
- sealing roads or closing off unused roads;
- using a road sweeper and water carts to minimise traffic generated and windblown dust from trafficable areas; and
- modifying its activities such as loading, unloading and crushing of materials in open areas to minimise windblown dust by the use of a water carts, stopping or postponing the activities during times of high wind, modifying the process to take place under cover where possible.
- Baghouses at key transfer points within the cement mill and raw material processing areas.

In addition to controlling fugitive dust emissions by implementing the actions outlined above, Boral Cement operates its plant to ensure point source emissions meet required standards. The continuous monitoring data of particles (Kiln 6) showed compliance with agreed standards. The specialised testing of Kiln 6 and Mill 7 throughout the year showed no non-compliances with agreed standards.

Boral Cement maintains a dust deposition monitoring program, currently consisting of seven dust deposition gauges and one high volume air sampler (HVAS) located around the perimeter of the site. Samples are collected from each gauge monthly to assess compliance against the EPA's dust deposition guidelines.

Results are published, as required by the EPL, on the Boral Berrima Cement website.

As discussed in the body of this section, average dust deposition data for dust gauges for the reporting period have values well below the EPA guideline of 4g/m2/month. These results confirm that the current dust control measures on site are generally working well.

During the reporting period, the site received 4 complaints relating to dust concerns.

All the complainants, where possible were contacted after the complaints were received. Further details are provided in Appendix 2 Complaints Summary.

Table 13: Air quality conditions

Number	Condition
K3.7	The Applicant shall design, construct, operate and maintain the cement works upgrade in a manner that minimises dust emissions from the site and complies with the EPL.
K3.7A	The Applicant shall apply all reasonable and feasible measures to minimise the generation of dust from coal stockpiles, including but not necessarily limited to: a) compaction of stockpile batters to minimise pick up of dust; b) installation of water sprays or use of a water cart to keep stockpile surfaces wet, if dust is being generated; and c) cessation of stockpile generation during periods of high wind, if dust generation cannot be controlled.
K3.8	The Applicant shall take all practicable measures to ensure that all vehicles entering or leaving the site and carrying a load that may generate dust are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times.
K3.9	All trafficable areas and vehicle manoeuvring areas on the site shall be maintained in a condition that will minimise the generation or emission of wind blown or traffic generated dust from the site at all times.
K4.1A	Continuous monitoring equipment for emissions, temperature and fuel feed rate, as required to meet the conditions of this consent and as agreed to by the EPA must be installed prior to receipt at the site of and use of non-standard Fuels in the upgraded Kiln 6
K4.1B	Prior to the commencement of the use of Non Standard Fuels, the applicant shall develop and implement an Ambient Air Quality monitoring program.
K4.1C	From the time of commencement of the use of Non Standard Fuels the applicant shall continuously monitor the following process parameters a. Gas temperature b. Carbon monoxide and volatile organic compounds c. Rates of feed for Non Standard Fuels AKF1 and AKF5 and the derived rate of feed for Hi CAL 50 in the coal feed d. Rates of feed of SWDF and e. Nitrogen oxides, hydrogen chloride, sulphur dioxide, carbon monoxide, solid particles (total) and volatile organic compounds.

K4.2	If the results of the monitoring required under conditions 4.1A, 4.1B and 4.1C and EPL no 1698 indicate that the operation of any component of the cement works upgrade, when operating under design loads and normal operating conditions, exceeds the limits imposed , the applicant shall provide details of remedial measures to be implemented to reduce air quality limits to the levels required.
M2.7 Dust Emissions	[5]The Applicant shall design, construct, operate and maintain the cement works upgrade in a manner that minimises dust emissions from the site. The raw material storage bunker associated with the cement works upgrade shall be maintained in a condition that effectively eliminates wind generated dust emissions. Dust collection systems shall be provided to all potential sources of dust production associated with the cement works upgrade. (Footnote: 5 Incorporates EPA General Terms of Approval (O2.1 and O2.2))
M2.8	The Applicant shall take all practicable measures to ensure that all vehicles entering or leaving the site and carrying a load that may generate dust are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times.
M2.9	All trafficable areas and vehicle manoeuvring areas associated with the cement works upgrade shall be maintained in a condition that will minimise the generation or emission of wind blown or traffic generated dust from the site at all times.
K3.10 Air Quality Discharges	The Applicant shall install and operate equipment in line with best practice to ensure that the Development complies with all load limits, air emission limits and air quality monitoring requirements as specified in the EPL for the site.
K3.10A	Deleted
M2.10 Discharge Limits	[6] The Applicant shall design, construct, operate and maintain the cement works upgrade to ensure that total solid particle emission from the exhaust stack on Cement Mill No.7 (EPA Identification Point 10) does not exceed 20mg/m^3 (100% concentration limit). The concentration limit specified above is based on 101.3 kPa, 273 K, dry reference conditions and shall be determined in accordance with the monitoring requirements described under condition 3.1. To avoid any doubt, this condition does not authorise the discharge or emission of any other pollutants. (Footnote: 6 Incorporates EPA General Terms of Approval (P1.1, L2.1 and L2.2))

Note: (K = Kiln 6, M = Mill 7)

Table 14: Response to air quality conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.7	**Dust monitoring** There are seven dust monitoring gauges and one HVAS around the perimeter of the site and in New Berrima. The locations of the gauges are shown on Figure 1. Samples are collected from the dust gauges each month and each week for the HVAS. The samples are assessed for compliance against the dust deposition and total suspended particulates (TSP) guidelines in *Approved Methods and Guidance for Analysis for the Modelling and Assessment of Air Pollutants in NSW* (DEC 2005) and *National Environment Protection Measure for Ambient Air Quality* (NEPC 1998) PM_{10} guideline. As there is no emission limit specified in the Licence, the following guidelines have been adopted: ● EPA dust deposition guideline of 4 g/m_2/month (expressed as a 12-month rolling average). ● NEPM PM_{10} 24 hr standard of 50 $\mu g/m^3$. ● EPA TSP annual goal of 90 $\mu g/m^3$. As can be seen in figure 6 and 7, the dust gauges and HVAS have values below the guidelines for the reporting period. **Stack Emissions**	Figure 6 shows the results of the analysis of the HVAS from May 2018 to April 2025. The trend during the year has been down. As can be seen, the current data shows that we remain below the EPA guideline of 4 g/m_2/month. Figure 7 shows the results of the analysis of the dust gauges located around the site and the New Berrima community from May 2018 to April 2025. As can be seen, the current data shows that we remain below the EPA guideline of 4 g/m_2/month. Boral Cement Berrima will continue to respond rapidly to, thoroughly investigate, and rectify any dust complaints received from the local community.	Dust control is a fundamental part of the operational management of this site. Dust is controlled through the implementation of the Dust Management Plan. As sound control measures are in place and this is supported by monitoring data, these operations will continue. During the reporting period the site commissioned 4 new real-time dust monitors and embedded the use of the new site Dust Trigger Action Response Plan. The data from the real time monitors is used as a management tool to notify staff when TARP triggers are met to enact the corresponding management response. . The network will be commissioned over 2025. Continue to publish Air Quality data on the Boral

	Yearly stack emission monitoring for Kiln 6 as required by the EPL was undertaken in October 2024 and March 2025. Figure 8 shows that the Works maintained emissions well under the EPA limits. 4 complaints were received from the community in relation to the deposition of dust on vehicles and properties. The complainants were contacted, where possible after the complaints were received. Further details are provided in Appendix 2.		website as required by the EPL.
K3.7A	See K3.7 above under Dust monitoring.	Reasonable and feasible measures are being implemented to minimise fugitive dust from coal stockpiles. This includes compaction of stockpile batters (being pushed up with a loader), wetting down with a water cart in dry weather conditions and stopping loading/unloading operations in high winds. The site's re-vegetation program is maturing in the areas surrounding the stockpiles to create a windbreak and a dust screen.	
K3.8	No complaints were received during this period regarding dust associated with vehicle movements and no related issues arose during this period.	All transport contractors are made aware of this requirement during site inductions. Section 3 of the *Driver Code of Conduct – Truck and Heavy Vehicles Operator*, which is part of the *Berrima Cement Works – Traffic Management Plan* (Boral 2017) includes requirements for all drivers of heavy vehicles on site to ensure they cover their loads and prevent spillages.	
K3.9	See K3.7 above under Dust monitoring. During this reporting period Boral Cement has continued to actively work to reduce the generation of dust from vehicles and internal haul roads	Some of the unsealed roads on site have been sealed in the previous years and some have been closed off and recently re-vegetated. Two wheel wash stations were installed in 2016, one at the exit of a shale pad, the other at the end of Quarry Road.	Boral Cement continues to investigate opportunities to reduce fugitive dust throughout the site. Issues are managed through

	through implementation of the Dust Management Plan.	The wheel wash stations continue to be routinely used. Boral Cement operates a road sweeper and water carts to minimise traffic generated and windblown dust from trafficable areas and vehicle manoeuvring areas. Mechanical sweepers undergo regular maintenance to ensure sweepers are working efficiently. Boral Cement modified its activities such as loading, unloading and crushing of materials in open areas to minimise windblown dust. Actions included the use of a water cart, stopping or postponing the activities until wind subsides, modifying the process to take place under cover where possible, etc.	immediate corrective action and reporting through the incident management database SEQuence. The expanded network of Real time dust monitors will allow potential dust to be managed depending on wind directions.
M2.7	Covered under KK3.7 and K3.7A		
M2.8	Covered under K3.8		
M2.9	Covered under K3.9		
K3.10	Stack emission monitoring for Kiln 6 was conducted by Ektimo in October 2024 and March 2025 in accordance with the sampling methods specified under EPL 1698. The reports demonstrated compliance with the emission limits for standard fuels for all monitoring parameters (see Figure 8).	No exceedances were demonstrated from stack emission monitoring for Kiln 6 from 1st May 2024 to April 2025 as demonstrated in Figure 8. No exceedances were demonstrated from continuous particulate stack monitoring.	Continue with operational practices and regular required stack testing
M2.10	Ektimo monitored solid particle emissions from the Mill 7 stack in October 2024 in accordance with the sampling methods specified under EPL 1698. The report demonstrated compliance with the emission limit.	Mill 7 Cement Mill Stack (EPA 10) Solid Particles licence limit 20mg/m3 Oct 2024 test report R017762) Solid Particles 4 mg/m3 Therefore compliant	Continue with operational practices and regular required stack testing

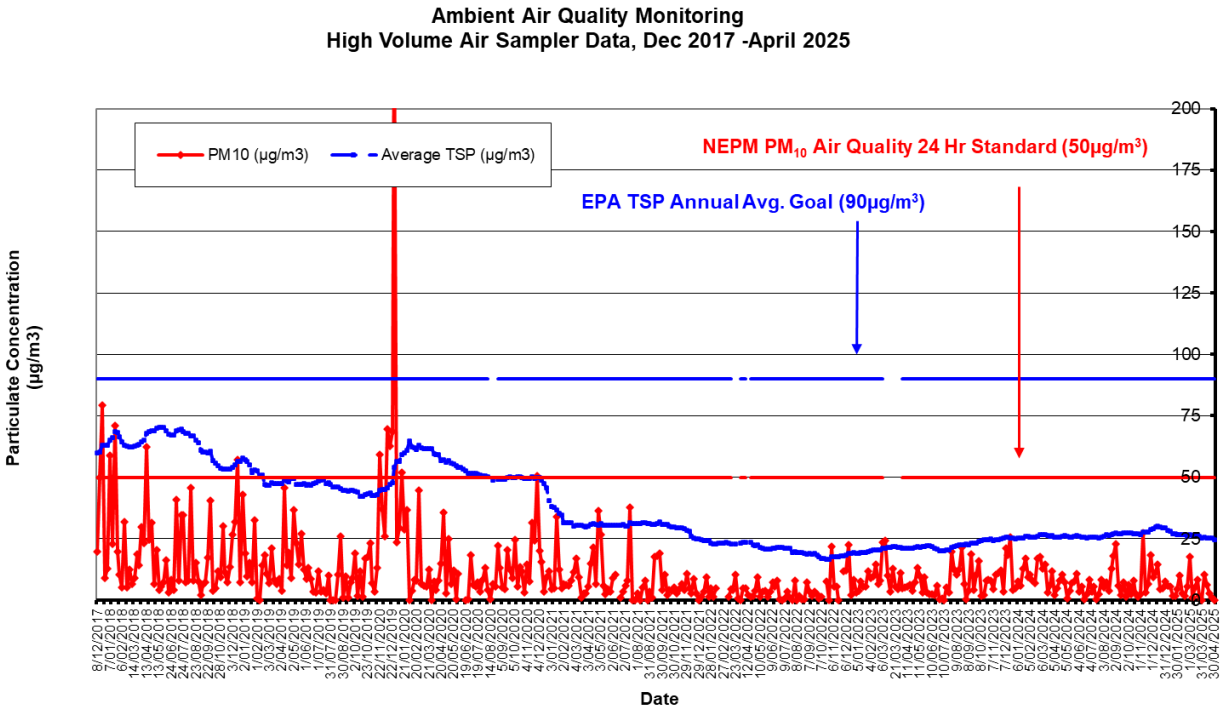


Figure 6 Ambient air quality monitoring December 2017 – April 2025

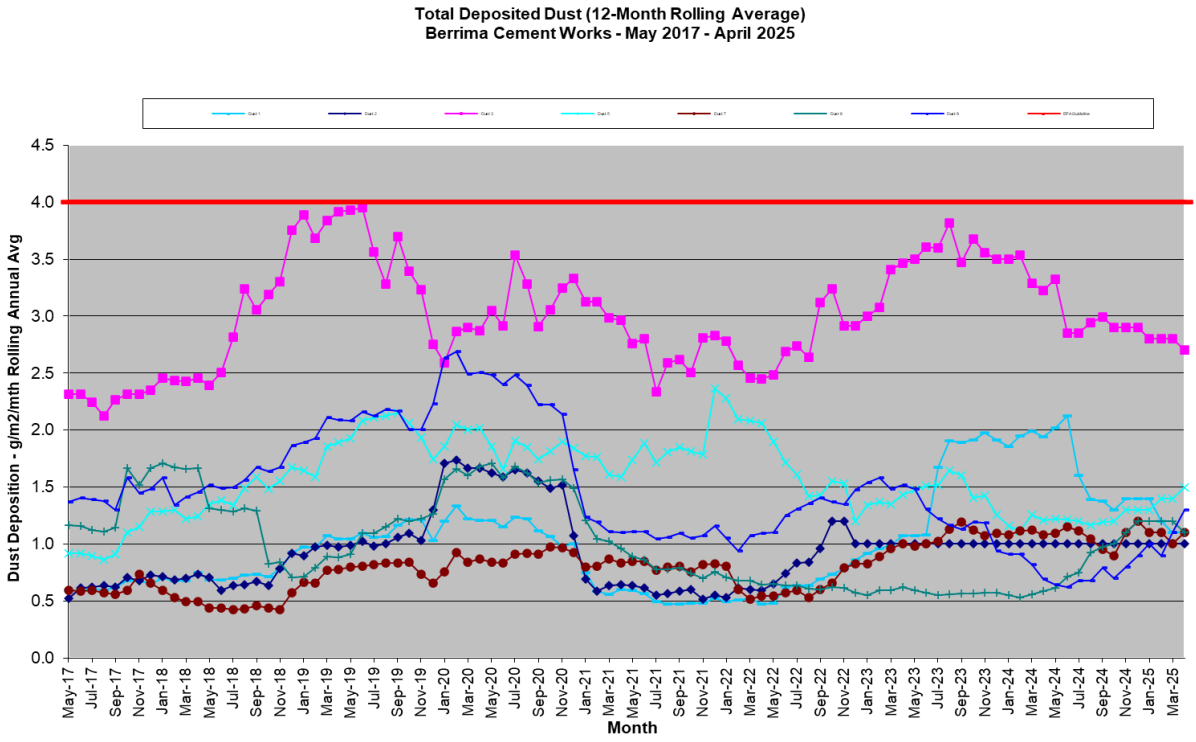


Figure 7 Total deposited dust (12-month rolling average) May 2017-April 2025)

Report ID	EPA 2	Kiln Stack	R017762 NPI	R017762 - COMPLIANCE	R016899-1
Pollutant	**Unit of Measure**	**Licence Limit**	**Oct/Dec - 24**	**Oct/Dec - 24**	**Mar-2025**
Vol flowrate (wet)	M3/sec		150	150	130
Velocity	m/s		32	32	27
Temp	C		106	106	113
Nox	mg/m3	1250	730	730	810
Solid Particles	mg/m3	50	49	44	15
Moisture	%		13	13	13
Molecular wgt stack gases	g per g mole		29.6	29.6	29.8
Dry das density	kg/m3		1.4	1.4	1.41
Carbon dioxide	%		17.3	17.3	19.2
Oxygen (O2)	%		10.4	10.4	9.8
Type 1 & 2 aggregate	mg/m3	0.5	<0.1	<0.13	<0.035
Cadmium	mg/m3	0.05	<0.0003	0.0016	<0.0002
Mercury	mg/m3	0.05	<0.008	<0.0054	<0.0039
Chlorine	mg/m3	50	<0.05	<0.05	<0.09
Carbon monoxide	%		330	330	230
Dioxins & Furans	nanograms/m3	0.1	0.0013	0.0013	0.0053
Chromium (hexavalent)	mg/m3		<0.0033	<0.0033	<0.0051
Hydrogen Chloride	mg/m3	10	0.73	0.73	6.6
Hydrogen fluoride	mg/m3	1	0.16	0.16	
Sulphur dioxide	mg/m3	50	<0.052	<0.052	<0.01
Sulfuric mist (SO3)	mg/m3	50	0.13	0.13	0.14
VOC	ppm	40	1.2	1.2	1.5
Thallium	mg/m3	0.05	<0.003	<0.005	<0.002
arsenic	mg/m3		<0.003	<0.005	<0.002
fine particulates	mg/m3		18		
coarse particulates	mg/m3		32		
benzene	mg/m3		1	1	0.95
Benzo(a)pyrene	mg/m3		10		
lead	mg/m3		0.0063	<0.004	<0.0027

Figure 8 Stack testing license comparison tables

5.4 Soils and water quality

The consent requirements for soils and water quality for Kiln 6 are in conditions 3.11 to 3.14 of Development Consent No. 401-11-2002-i and for Mill 7 in conditions 2.11 to 2.14 of Development Consent No. 85-4-2005-i, which are replicated in Table 15. The consents refer to EPL 1698, however, there are no water discharge limits in the EPL.

Table 16 sets out the site's performance during the past year relating to soils and water quality and the key management measures that are used at the site.

Boral manages water on site in accordance with the *Berrima Cement Works – Water Management Plan* (Boral 2023), which describes the monitoring points, frequency and parameters. Storm water and residual process water from all areas of the Works (including Kiln 6 and Mill 7) is harvested and used on site with water quality in the storages (Lake Quality and Lake Breed) tested monthly, and water quality in the receiving waterway (Wingecarribee River) tested every three months. Water is only discharged from site during very heavy rainfall, with three overflow events during the reporting period.

Three of the conditions relate to construction, with the tyre storage facilities being completed in 2024. CEMPs required under Mod 13 and Mod 15 detailed the specific water management requirements.

Approval of Modification 15 for the Tyre Chip Storage Area required the management of Fire water and the construction of a Fire Water catchment bund. This was detailed in the CEMP prepared for this modification. The Water Management plan has been updated to reflect this requirement.

It is demonstrated in Table 16 that the overall water management performance of the site is good. This indicates that the water management performance at Kiln 6 and Mill 7 is also good and that the conditions have been complied with during the reporting period.

The site continues to source a large portion of its daily usage requirements from waters collected within the shale pit voids as well as water harvested onsite and managed in Lake Quality and Lake Breed. The business will continue to prioritise waters harvested onsite, however as a large consumer of water this will require the Wingecarribee River to be the main source of water, in times of low volumes onsite. In the longer term the aim will be to source waters from the former Berrima Colliery.

Table 15: Soils and water quality conditions

Number	Condition
K3.11 Construction Soil and Water Management	Soil and water management measures consistent with Managing Urban Stormwater – Soils and Construction Vol.1 (Landcom, 2004) (the Blue Book) shall be employed during construction of the Development to minimise soil erosion and the discharge of sediment and other pollutants to land and/or waters.
K3.12	All construction vehicles exiting the site, having had access to unpaved areas, shall depart via a wheel-wash facility.
K3.13	All erosion and sedimentation controls required as part of this consent shall be maintained for the duration of the construction works, and until such time as all ground disturbed by the construction works, has been stabilised and rehabilitated so that it no longer acts as a source of sediment.
K3.14 Water Discharge Limits	The Applicant shall ensure that all surface water discharges from the site comply with the: a) discharge limits (both volume and quality) set for the development in any EPL; or b) relevant provisions of the POEO Act.
K3.14A Water Crossing	The Applicant must design and construct the watercourse crossing on the site access road approved under MOD 14 in accordance with the Department's Fact Sheet Controlled Activities – Guidelines for watercourse crossings on waterfront land (2022) and the design in the Roadworks and Drainage Layout Plan – Sheet 3 prepared by SLR dated 20 February 2023, Revision P3, Drawing Number 660.30247-CI-1103.
M2.11 Water Quality Impacts	[7]Except as may be expressly provided by a licence under the Protection of the Environment Operations Act 1997 in relation to the cement works upgrade, section 120 of that Act (pollution of waters) shall be complied with in, and in connection with, the carrying out of the cement works upgrade. (Footnote 7: 7 Incorporates an EPA General Term of Approval (L1.1))
M2.12 Erosion and Sediment Control	All construction vehicles exiting the site, having had access to unpaved areas, shall depart via a wheel-wash facility.
M2.13	All erosion and sedimentation controls required as part of this consent shall be maintained for the duration of the construction works, and until such time as all ground disturbed by the construction works, has been stabilised and rehabilitated so that it no longer acts as a source of sediment.

M2.14 Site Drainage and Stormwater	The Applicant shall ensure that the cement works upgrade does not lead to an increase in the volume or flow rate of stormwater leaving the site over and above pre-development flow conditions.

Note: (K = Kiln 6, M = Mill 7)

Table 16: Response to soils and water quality conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.11	There were three overflows from Lake Quality during the reporting period (14/05/2024, 6/06/2024 and 02/05/2025)). Water was sampled at the overflow point (EPA Point 9), which had the following results: ● Biochemical oxygen demand (mg/L) – 5, 5 & <2 (guideline:20) ● Oil and grease (mg/L) – <5, 17 & <5(guideline: 10) ● pH – 8.2, 8.5 - & 7.9 ● Total suspended solids (mg/L) – <5, 30 & <5 (guideline: 30-50) The results were within guideline values, with 1 O&G being slightly elevated. Water results were reported as part of the site POELA monthly reports.	The discharge water quality is similar to previous years, with only three overflow events for the year, as a result of several periods of substantial rain in short periods of time. .	In order to ensure sufficient capacity in Lake Quality in the event of a rain event, water for production will primarily be taken from Lake Quality prior to extracting water from Wingecarribee River. The approved CEMP for Mod 15 details specific water management measures and specifically references *Managing Urban Stormwater – Soils and Construction Vol.1 (Landcom, 2004)* (the Blue Book)
K3.12	Construction vehicles exited the site via a wheel wash.	NA	
K3.13	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends. Three overflow events have occurred since construction of the Tyre chip storage facility commenced during the reporting period of the AEMR, but with no impact on water quality.	Refer to K3.11

K3.14	No water volume and quality discharge limits are specified in EPL 1698. Notwithstanding, the EPL requires monitoring at the Lake Quality overflow point during overflows. There were three overflows from Lake Quality during the reporting period (14/05/2024, 6/06/2024 and 02/05/2025)). Water was sampled at the overflow point (EPA Point 9), which had the following results: ● Biochemical oxygen demand (mg/L) – 5, 5 & <2 (guideline:20) ● Oil and grease (mg/L) – <5, 17 & <5(guideline: 10) ● pH – 8.2, 8.5 - & 7.9 ● Total suspended solids (mg/L) – <5, 30 & <5 (guideline: 30-50) The results were within guideline values, with 1 O&G being slightly elevated. Water results were reported as part of the site POELA monthly reports.	The water in Lake Quality is reused in site processes and the lake only overflows during heavy rainfall. There were three overflow events during the reporting period. Sampling demonstrated that water quality met the typical NSW discharge criteria. .	*Berrima Cement Works* – Water *Management Plan* (Boral 2023) is implemented at the Works, which includes the Kiln 6 area and is reviewed every three years or after an incident and is revised/improved as deficiencies become apparent.
K3.14A	Not yet commenced		
M2.11	No water volume and quality discharge limits are specified in EPL 1698.	Refer to K3.14.	*Berrima Cement Works* – Water *Management Plan* (Boral 2020) is implemented at the Works, which includes the Mill 7 area and is reviewed every three years or after an incident and is

			revised/improved as deficiencies become apparent.
M2.12	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends.	Three overflow events have occurred since construction of the Tyre Chip storage facility commenced in the reporting period. Construction has had no impact on water quality.
M2.13	Refer to K3.12.	Construction is a short-term activity which cannot be used to establish trends.	Three overflow events have occurred since construction of the Tyre Chip storage facility commenced in the previous reporting period. Construction has had no impact on water quality.
M2.14	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends.	Three overflow events have occurred since construction of the Tyre Chip storage facility commenced in the previous reporting period. Construction has had no impact on water quality.

Note: (K = Kiln 6, M = Mill 7)

5.5 Traffic and transport

The requirements for traffic and transport for Kiln 6 are in conditions 3.15 to 3.16D of Development Consent No. 401-11-2002-i and for Mill 7 in conditions 2.15 to 2.17 of Development Consent No. 85-4-2005-i, which are replicated in Table 17 including the additional traffic management conditions were added as part of Approval of Modification 14.

Table 18 summarises the site's performance during the past year relating to traffic and transport and the key management measures that are used at the site.

Boral manages traffic on site in accordance with the Traffic Management Plan

Condition 3.15 and 3.16 related to the initial construction of Kiln 6 and are no longer directly applicable, however Condition 3.16 is applied to other construction works such as the CBS and Tyre Chip storage facility undertaken in the reporting period.

CEMPs prepared for both projects detail specific traffic management protocols.

The Site Vehicle and Pedestrian Management Plan has been updated to reflect Modification 13 and 15 and is an Appendix to the OEMP.

Two of the conditions relate to parking provision and truck queuing. Sufficient car parking has historically, and continues to be, provided to accommodate employee and visitor vehicles on site without the need to park on surrounding public roads. Deliveries of fuel and ingredient materials for Kiln 6, and ingredient materials for Mill 7, have not historically, and continue to not, require queuing of trucks along Taylor Avenue. Therefore, operations at Kiln 6 and Mill 7 complied with the traffic and transport consent conditions during the reporting period.

Table 17: Traffic and transport conditions

Number	Condition
K3.15	Traffic and Transport Impacts The Applicant shall establish a bus transport system generally consistent with that identified in section 6.9 of the SEE to transport construction employees to and from the site during the construction period.
K3.16	The Applicant shall ensure that vehicles associated with the cement works upgrade do not stand or park on any public road or footpath adjacent to the site. Measures provided by the Applicant shall include sufficient parking for all employees and contractors during construction and operation of the cement works upgrade and management measures to ensure that heavy vehicles entering the site are not permitted to queue on Taylor Avenue at any time.
K 3.16A 3.16B 3.16C 3.16D 3.16E Port Kembla Coal Haulage Campaigns Deleted.	
K3.16A	The Applicant shall pay a road maintenance levy to Council of 4 cents/tonne/km for the transport of SWDF.
K3.16B	The Applicant must ensure the maximum number of heavy vehicle trips per day for the delivery of raw materials and Kiln 6 fuels does not exceed a maximum total of 256 trips (128 total heavy vehicle deliveries) as stated in Table 1 of Boral Limited's correspondence to the Department dated 21 September 2023 (Attachment 1 of the Amendment Request prepared by Boral Limited dated 27 October 2023, submitted as part of MOD 14). Note: For the purposes of this condition and condition 3.16C of this consent, "heavy vehicle trip" means a one-way heavy vehicle movement from one point to another, excluding the return journey.
K3.16C	Notwithstanding condition 3.16B of this consent, the Applicant must ensure the maximum number of heavy vehicle trips per day for the delivery of raw materials and Kiln 6 fuels does not exceed 212 trips (106 total heavy vehicle deliveries) until such time the requirements of condition 1.4AA of this consent have been satisfied.
K3.16D	The Applicant must record and maintain a log of the total number of heavy vehicle movements per day associated with the receipt of raw materials and Kiln 6 fuels. The log must: a) be kept on site and be available for inspection by either Council or Transport for NSW upon request; and b) be published on the project website every six months.
M2.15 Traffic and	The Applicant shall establish a bus transport system generally consistent with that identified in section 6.6.7 of the SEE referred to in condition 1.2b to transport construction employees to and from the site during the construction period.

Transport Impacts	
M2.16	The Applicant shall ensure that vehicles associated with the cement works upgrade do not stand or park on any public road or footpath adjacent to the site. Measures provided by the Applicant shall include sufficient on-site parking for all employees and contractors during construction and operation of the cement works upgrade and management measures to ensure that heavy vehicles entering the site are not permitted to queue on Taylor Avenue at any time.
M2.17	The Applicant shall install an advance warning signage along Taylor Avenue to advise vehicles approaching the entrance to the site of turning truck traffic in the area. This signage is to be installed prior to the commencement of operations of the cement works upgrade. Details of the design and installation of this signage are to be provided to the satisfaction of the Director-General prior to the commencement of operations at the cement works upgrade.

Note: (K = Kiln 6, M = Mill 7)

Table 18: Response to traffic and transport conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.15	Only a small workforce was required to construct the alternative waste facility with employees travelling to site from different directions. Therefore, a bus service was not implemented for construction during this reporting period as it was not required nor practical.	Construction timeframes are short and no performance trends can be established.	The Construction Traffic Management Plan will be reviewed as part of any new CEMPs to be prepared.
K3.16	No construction vehicles stood or parked on public roads or footpaths as there is sufficient room on roads within the site and parking areas to accommodate vehicles. Employee car parking was extended three years ago. The employee car park has unused capacity.	Construction timeframes are short, and no performance trends can be established.	The Construction Traffic Management Plan will be reviewed as part of any new CEMPs to be prepared.
K3.16A	99193.73 tonnes of SWDF were used in the reporting period, at the time of writing the levy has yet to be paid to Council. The levy payable should = (Reporting Year SWDF tonnes x 0.04) x 2.6 Invoice cannot be issued by Council until Annual Report is reviewed and approved by DPHI	SWDF vehicles travel 2km from the highway to the site entrance and return to the highway. Based on 21869t in 2018/19 a levy of $2274.31 was payable. Based on 28997t in 2019/20 a levy of $3015.69 was payable. Based on 34767t on 2020/21 a levy of $3615.78 is payable Based on 34654t on 2021/22 a levy of $3,604.02 is payable Based on 54396t on 2022/23 a levy of $5657.18 is payable	All prior invoices have been paid. A copy of this Annual Report will be made available for Council to enable the 24/25 invoice to be issued.

		Based on 64815t on 2023/24 a levy of $6740.76 is payable Based on 99193.73t on 2024/25 a levy of $10316.15 is payable	
K3.16B	Heavy Vehicle movements have not exceeded the maximum total of 256 trips	Movements are managed with the suppliers and tracked via log and weighbridge	
K3.16C	Heavy Vehicle movements have not exceeded the maximum total of 212 trips	Movements are managed with the suppliers and tracked via log and weighbridge	
K3.16D	Log in place and is available. Report available on website as of June 2024. Reports available June to November 2024 December 2024 to May 2025	Movements are managed with the suppliers and tracked via log and weighbridge	Ongoing tracking and reporting on a 6 monthly basis June and November with report to website.
M2.15	NA	NA	NA
M2.16	No construction vehicles stood or parked on public roads or footpaths as there is sufficient room on roads within the site and parking areas to accommodate vehicles. Employee car parking was extended three years ago. The employee car park has unused capacity.	Construction timeframes are short and no performance trends can be established.	NA
M2.17	As previously reported, warning signage was installed along Taylor Avenue.	This was a one-off activity with no associated trends.	Signs will be replaced if damaged or defaced.

Note: (K = Kiln 6, M = Mill 7)

5.6 Waste management

The consent requirements relating to waste management for Kiln 6 are in conditions 3.17 to 3.17C of Development Consent No. 401-11-2002-i and for Mill 7 in Condition 2.18 of Development Consent No. 85-4-2005-i, which are replicated in Table 19.

The consents refer to EPL 1698, which provides requirements on the management of alternative fuels in conditions L4, O5, O6.1/2/3/4/5/6/7/8/9/11 and 12

E4 of the EPL provides the requirements of the Proof of performance trial (10% increase in SWDF percentage of Total Fuel mass).

Section 8.2 of the CEMP's for various projects such Modification 15 details the Construction and Demolition Waste Management Plan.

Table 20 sets out the site's performance during the past year relating to waste management and the key management measures that are used at the site.

Boral manages waste on site in accordance with *Berrima Cement Works – Waste Management Plan* (Boral 2023), which describes recycling and disposal requirements for the different waste categories generated and used on site.

The waste conditions and the EPL 1698 specifically detail what wastes can be received on site for storage, treatment, processing, reprocessing or disposal such as granulated blast furnace slag (slag). These conditions exclude non-standard fuels approved for use at Kiln 6.

Table 19: Waste conditions

Number	Condition
K3.17 Waste Management Impacts	Except as otherwise permitted by this consent and a licence issued under the Protection of the Environment Operations Act 1997 the Applicant shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing or disposal, or any waste generated at the site to be disposed of at the site.
K3.17A	Condition 3.17 of this consent only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require a licence under the Protection of the Environment Operations Act 1997 (POEO Act), and does not include: a) any Non-Standard Fuels approved for use at the upgraded Kiln 6 under this consent; b) any material normally brought to the site for the purpose of cement clinker production (as detailed in the documents listed under condition 1.2 of this consent); c) any material normally recycled or reused within the cement works; and d) any material that is subject to a specific waste recovery exemption (RRE) issued by the EPA to exempt that material from the specific clauses of the Protection of the Environment (Waste) Regulation 2005.
M2.18 Waste Management Impacts	[8]The Applicant shall not cause, permit or allow any waste generated outside Cement Mill 7 to be received at Cement Mill 7 for storage, treatment, processing, reprocessing or disposal, or any waste generated at Cement Mill 7 to be disposed of at Cement Mill 7, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997. This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an environment protection licence under the Protection of the Environment Operations Act 1997. (Footnote 8: 8 Incorporates an EPA General Term of Approval (L3.1 and L3.2))
K3.17AB Alternative Raw material Trial - Granulated Blast Furnace Slag (GBFS)	Prior to the receipt of GBFS on-site, the Applicant must obtain a specific waste Resource Recovery Exemption (RRE) for GBFS from the EPA.
K3.17AC GBFS Trial Requirements	Provided that the specific waste RRE is obtained for GBFS, the Applicant shall trial the use of up to 3,000 tonnes of GBFS as an alternate raw material in Kiln 6. The Applicant shall: a) undertake the trial over a continuous 3 day period, unless otherwise agreed in writing by the Secretary;

	b) conduct stack testing of all relevant air emissions and trace elements, to the satisfaction of the EPA; and c) use quality controlled GBFS only.
K3.17AD GBFS Trial Verification Report	Within 1 month of the completion of the GBFS trial, the Applicant shall prepare and submit a Verification Report to the Department to the satisfaction of the Director-General and the EPA. The Verification Report shall include: (a) stack emissions monitoring data measured for the duration of the trial; (b) copies of all analytical test reports for all substances sampled and tested; (c) a comparison of monitoring results from the trial with the relevant EPA standards and requirements, as determined by the EPA.
K3.17AE	Provided the results of stack testing for the GBFS trial confirm that the air pollutants emitted from the cement Kiln 6 meet the relevant EPA standards and requirements, the Applicant may commence full-scale usage of GBFS as a raw material additive in Kiln 6 at a maximum usage rate that is determined in writing by the Secretary in consultation with the EPA. Note: the Applicant must not commence full-scale usage of GBFS as a raw material additive in Kiln 6 until it has received written approval from the Secretary. In addition, the maximum usage rate per annum of GBFS in cement Kiln 6 must not exceed 150,000 tonnes per annum.
K3.17B	Except as provided by any condition of a licence under the Protection of the Environment Operations Act 1997, only the following 'Group A' waste may be stored at the site: a) AKF1.
K3.17C	Except as provided by the condition of a licence under the Protection of the Environment Operations Act 1997, the Applicant must assess, classify and dispose of all wastes generated as a result of the use of Non-Standard Fuels in a accordance with the NSW EPA's Waste Classification Guidelines.

Note: (K = Kiln 6, M = Mill 7)

Table 20: Response to waste conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.17	Except for raw materials and SWDF non-standard fuels and HiCal 50 approved in EPL 1698 no waste generated outside the Works was received at the site during the reporting period.	The Operational Environmental Management Plan was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).	Boral undertook a review of the OEMP, to reflect the Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020. A further review of the OEMP occurred in 2023 to include management and use of tyre chips. A revision of the OEMP was undertaken and issued to the DPHI in May 2025 for approval. The OEMP was updated to include Mod 14 requirements, the real time ambient air quality monitoring network and AKF1 management. The CEMP was updated in response to MOD 13 to include the construction of the CBS and was approved on 24 February 2022, with construction occurring during the reporting period. The CEMP was further updated in response to Modification 15, in 2023.
K3.17A	As described above and prohibited by Condition L4.1 of the EPL, no waste	The Operational Environmental Management Plan was updated in April 2018 in accordance with Condition 6.7 to incorporate	Boral undertook a review of the OEMP, to reflect the Mod 11 and 12 to the consent and changes to the EPL completed by the

	generated outside the Works was received at the site during the reporting period.	measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).	EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020. A further review of the OEMP occurred in 2023 to include management and use of tyre chips. A revision of the OEMP was undertaken and issued to the DPHI in May 2025 for approval. The OEMP was updated to include Mod 14 requirements, the real time ambient air quality monitoring network and AKF1 management. The CEMP was updated in response to MOD 13 to include the construction of the CBS and was approved on 24 February 2022, with construction occurring during the reporting period. The CEMP was further updated in response to Modification 15, in 2023.
M2.18	Landfilling of waste is prevented by crushing and recycling old refractory bricks through the kiln.	No waste materials are disposed on site.	
K3.17AB	The site-specific resource recovery exemption for full-scale GBFS use was issued by EPA on 19 September 2012.	The use of GBFS since 2012 has not resulted in an increase in stack emissions (see responses to air quality).	Current management measures for the use of GBFS are achieving desired outcomes.
K3.17AC	Compliance with this condition was detailed in the AEMR for 2013 – the trial was conducted between 14-16 May 2012 with stack testing on 15 May, the use of quality	The use of GBFS since 2012 has not resulted in an increase in stack emissions (see responses to air quality).	Current management measures for the use of GBFS are achieving desired outcomes.

	controlled GBFS and provision of a report on 13 July 2013.		
K3.17AD	Compliance with this condition was detailed in the AEMR for 2013 – the verification report was provided on 13 July 2013 which reported that there were no stack contributions from the GBFS, coal use decreased and CO_2/CO emissions decreased.	The use of GBFS since 2012 has not resulted in an increase in stack emissions (see responses to air quality).	Current management measures for the use of GBFS are achieving desired outcomes.
K3.17AE	Compliance with this condition was detailed in the AEMR for 2013 – the Secretary approved the ongoing use of GBFS in a letter dated 7 September 2012.	Boral has been using less GBFS than the approved rate of 150,000 tonnes per annum.	Current management measures for the use of GBFS are achieving desired outcomes.
K3.17B	No AKF1 or other Group A wastes were stored on site during the reporting period.	The Operational Environmental Management Plan was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018). A specific review of the OEMP was undertaken in May 2025 to ensure management controls were still appropriate for the use of AKF1.	Boral undertook a review of the OEMP, to reflect the Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020. A further review of the OEMP was undertaken in relation to the approval of Modification 15 for the storage of AKF5 (tyre chips).
K3.17C	There has been no generation of wastes from the use of the SWDF non-standard fuels. No wastes can be generated when consumed in the kiln as any ash forms part of the clinker product. Minor spillages near the shed entrance are either swept into the shed or if contaminated with other materials such as aggregates etc this material is swept up and placed into the	Wastes generated from the use of nonstandard fuels on site will be classified using the NSW EPA's Waste Classification Guidelines in accordance with EPL Condition L4.2.	Wastes generated from the use of nonstandard fuels on site will be classified using the NSW EPA's Waste Classification Guidelines in accordance with EPL Condition L4.2. They will then be disposed of accordingly if required.

	site skip bins used for other site waste. These skip bins are sent to Resource Co who in turn make SWDF to supply to site.		

Note: (K = Kiln 6, M = Mill 7)

5.7 Non-standard fuels

The non-standard fuels consent requirements for Kiln 6 are in conditions 1.4A to 1.45J as well as 3.20 to 3.28 of Development Consent No. 401-11-2002-i, which are replicated in Table 21 and considered in Table 22. The consent refers to EPL 1698, which provides non-standard fuel requirements in conditions O5, O6.1/2/3/4/5/6/7/8/9/11 and 12 and E4.

In August 2018 Boral Cement commenced the use of Solid Waste Derived Fuels (SWDF) including Wood Waste (WW) and Refuse Derived Fuels (RDF). As per condition 3.25 a Proof of Performance Trial was undertaken with the six month report submitted to the Department for approval on 28 February 2018.

On the 23 April 2019 the Secretary approved the ongoing use of SWDF subject to:

a) limiting the amount of SWDF to be fired in Kiln 6 to 40%, as a percentage of total fuel,
b) periodic stack testing being undertaken every three months for the first 12 months of use of SWDF. The monitored pollutants must be consistent with the requirements of the Environment Protection Licence (EPL 1698)
c) provision of a monitoring report that outlines the results of the quarterly stack testing required in (b) above and provides an assessment of compliance against the air emissions limits for the facility, to the satisfaction of the Secretary
d) periodic measurements of hydrogen chloride (HCl) taken every three months until such time the Secretary agrees the accuracy of the HCl CEMS is confirmed through successful calibration audits undertaken in accordance with the USEPA Performance Specification 18.

The EPA updated the licence to reflect these changes in December 2019.

On the 16 November 2018 Boral sought approval from the Department to store up to 17 500t of carbon anode material (Hi Cal 50), sourced from the former Hydro Aluminium Kurri Kurri smelter for a period of 36 months. The Department reviewed the request and the additional information provided in consultation with the EPA and on 4 April 2019 confirmed approval of:

- the 'Hi Cal 50 Storage and Handling Procedure', Version 3 dated 27 March 2019 and
- the 'Hi Cal 50 (Carbon anode ex-Hydro Kurri Kurri) Recovered Resource Specification Version 3 dated 27 March 2019

During the 2019/20 reporting period (October 2019) MOD 11 was approved to permit the use of Hi Cal 50 during start up conditions. The site consumed 2951t of Hi Cal during the 2021/22 reporting period.

During the 2022/23reporting period, Modification 15 was approved for the construction and operation of AKF5 storage and feed infrastructure. Construction and operation commenced in the current reporting period.

In November 2023 Modification 14 was approved for the increase of volume of SWDF received and used as a non standard fuel in Kiln 6 and with 24/7 delivery of SWDF, via the construction of a new site access road and associated additional SWDF storage.

In the current reporting period, a PoP trial commenced in March 2025 for SWDF up to 60% total fuel mass and co-firing with AKF5 in line with Condition of Consent 1.4AB.

Discussions were held with the DPHI and EPA on the AKF5 (tyre chip) specification. The Specification allowed only shredded tyres to be accepted from organisations who were part of the Tyre Stewardship scheme. Changes were made to the AKF5 specification allowing tyres to be sourced from approved licenced mix waste resource recovery facilities following procedural reviews and audits of the suppliers.

Boral has approval to use AKF1 materials such as heavy fuel oils. Discussions and approvals of procedures for the use of heavy Fuel oils have occurred over the reporting period with DPHI and the EPA. Use of AKF1 is to recommence in the next reporting period following PoP trials.

During the reporting period SWDF usage increased slightly going from 64 815t to 99193.73t.

As required by Condition 4.6, an annual audit on non-standard fuels was undertaken by Robert Byrnes of International Environmental Consultants covering the period of 30th September 22 to 1st October 2024. The audit found

"*Boral has taken significant time and care in the preparation for the use of NSF as a long term replacement for coal. The trials have been successful and have resulted in some fine tuning of the use and management within the process over the past six years. The audit did not identify any non-compliances with the consent nor Environment Protection Licence. The audit can also confirm that the predictions made in the air quality model contained in the environmental assessment supporting the original modification 9 have not been exceeded*."

Recommendations arising from this audit are summarised as follows:

ρ *Boral should investigate methods to obtain composite NSF supplier sample results quicker than is currently the case.* This is being investigated

ρ *Any new supplier of NSF should be subject to the same QA/QC management and reporting structure.* This is a requirement of the consent. The use of any new supplier is to be approved by DPHI following receipt of the QA/QC procedures and details of the product to be used.

ρ *A further revision to the OEMP should be undertaken to incorporate the more recently approved MOD 14 as this modification includes an increase in use of NSF as well as the construction of a new road access to the site.* Review has been undertaken with the revised OEMP submitted to the DPHI in MY 2025 for approval.

An annual independent audit is also undertaken of the suppliers of the SWDF to ascertain compliance to the quality procedures and specification requirements. The audit was conducted in March 2025 and found…

"ρ the sourcing, use and quality of NSF meets the requirements of the development consent.

ρ *Boral's management of NSF and operating procedures seek to minimise the formation of dioxins in the stack emissions.*

ρ *As with previous supplier audits, Quality Control procedures have been maintained over the audit period.*

ρ *Boral's handling, processing, verification and analysis of information generated by each supplier has been reviewed and found to be satisfactory.*

ρ *To date, the use of NSF has not resulted in the need to shut down the kiln either from a change in operating temperature or quality control problem. Systems are in place to monitor temperature on a continuous basis and the shut down sequence, if required, is automatic.*

This audit has found that each of the current four SWDF suppliers comply with the approved QA/QC system. Each supplier understands the requirements of the QA/QC system and the need to maintain a consistent product which meets the required specification.

Boral's cross checking of SWDF quality using the same laboratory provides sufficient verification and this data is attached to this report.

Suppliers are now assessed against ongoing quality data provided by independent laboratory services. The results of Borals monitoring of the material was also discussed with each supplier and the responses indicated that each supplier is aware of the value of the monitoring data and the need to

analyse the data for the purposes of demonstrating the ability to comply with the product specifications over time.

To date, the monitoring data does not indicate that there are identifiable risks to future non-compliance. Each site also understood the concept of continuous improvement which is a key component of a robust quality assurance system."

The audit recommended that:…

- as there is a considerable delay in receiving the results from the laboratory, consideration should be given to ensuring that results are provided in a timely manner to allow corrective actions to occur quickly. Although the turnaround time has reduced it is recommended that the time be reduced further.
- Boral should continue the analysis of NSF delivered by each supplier and provide regular feedback on performance.
- Transport operators should be encouraged to stagger deliveries to the cement plant to avoid congestion when unloading at the NSF shed.

Efficiencies in lab turnarounds and management of truck movements are being reviewed.

Table 21: Non-standard fuels conditions

<table>
<tr><th>Number</th><th>Condition</th></tr>
<tr><td>K1.4A Use of non standard fuels</td><td>Subject to meeting the requirements of this consent, and the requirements of a licence issued under the Protection of the Environment Operations Act 1997 for the site, the following fuels are permitted to be received at the site for use at the upgraded Kiln 6 development at the quantities, firing rates and proportions specified in Table 1.

Table 1 – Permitted Fuels for use in upgraded Kiln 6
<table><tr><th>Fuel</th><th>Category</th><th colspan="2">Tonnes per annum</th></tr><tr><td>Natural Gas, Fuel Oil, Diesel</td><td>Standard Fuel</td><td colspan="2">No limits</td></tr><tr><td>Coal</td><td>Standard Fuel</td><td colspan="2">No Limit</td></tr><tr><td>Coke Fines</td><td>Standard Fuel</td><td colspan="2">No Limit</td></tr><tr><td>Hi Cal 50</td><td>Non-Standard Fuel</td><td colspan="2">10,000</td></tr><tr><td>AKF1</td><td>Non-Standard Fuel</td><td colspan="2">20,000</td></tr><tr><td>AKF5</td><td>Non-Standard Fuel</td><td colspan="2">30,000</td></tr><tr><td>Wood Waste</td><td>Non-Standard Fuel</td><td>100,000</td><td rowspan="2">≤ 250,000 combined</td></tr><tr><td>RDF</td><td>Non-Standard Fuel</td><td>200,000</td></tr><tr><td>Woodchips</td><td>Standard Fuel</td><td colspan="2">150,000</td></tr></table>
Note: The consent, as modified, permits only the use of the fuels listed above at the specified quantities. The use of any additional fuels would be the subject of appropriate assessment and determination under the Act. This consent, as modified, does NOT approve the establishment of a protocol for general use of Non-Standard Fuels.</td></tr>
<tr><td>K1.4AA</td><td>Notwithstanding condition 1.4A of this consent, the Applicant must not receive any woodchips at the site for any purpose until:

a) the new site access road approved under MOD 14 is constructed and operational; and

b) the Applicant has notified the Planning Secretary in writing via the NSW Planning Portal that the site access road has been constructed in accordance with the consent and is operational; and

c) the Planning Secretary has indicated in writing that it is satisfied the site access road has been constructed in accordance with the consent and is operational.</td></tr>
</table>

K1.4AB	Notwithstanding condition 1.4A of this consent, the Applicant must: a) limit the combined annual usage of SWDF to no more than 50% of total fuel mass until appropriate Proof of Performance Trials are undertaken to the satisfaction of the EPA and the Planning Secretary for each 10% incremental increase in SWDF usage above 50%; and b) not co-fire non-standard fuels permitted by condition 1.4A of this consent unless compliance with the air emission limits on the EPL has been demonstrated for that combination of fuel types through a Proof of Performance Trial to the satisfaction of the EPA and the Planning Secretary.
K1.4B	AKF5 is approved for use at the development under this consent subject to the necessary approvals under the Act being obtained for storage facilities and kiln feeding infrastructure. Use of AKF5 at the development must be carried out in compliance with the following No AKF5 is permitted to be received at the site until the necessary storage facilities and kiln feeding infrastructure have been constructed in accordance with any such approvals. Storage of AKF5 must be in accordance with Fire & Rescue NSW (Fire Safety Branch) Guidelines for Bulk Storage of Rubber Tyres. If the Applicant proposes to exceed the stockpile sizes and heights within the above Guidelines, the Applicant must obtain written approval from Fire and Rescue NSW, to the satisfaction of the Secretary. Any AKF5 stored outside or in storage bunkers mut be roofed to exclude rainwater
K1.4BA	Notwithstanding condition 1.4B of this consent, the Applicant must undertake an air emissions stack test within three months of the commencement of use of AKF5 as a fuel in Kiln 6, or as otherwise agreed to by the Planning Secretary. The Applicant must: a) carry out the air emissions stack test to the satisfaction of the Planning Secretary; b) undertake the air emissions stack test at a high feed rate of 4.5 tonnes per hour of AKF5, or as otherwise approved by the EPA; c) engage a suitably qualified and experienced person(s) to carry out the air emissions stack test; d) notify the Planning Secretary and EPA prior to the commencement of the air emissions stack test; and e) report the outcomes of the trial and stack test to the Planning Secretary and the EPA within one month of the conclusion of the test period, unless otherwise agreed by the Planning Secretary.
K1.4BB	The air emissions stack test report required by condition 1.4BA must include the following information: a) the dates and times when the air emissions stack test was carried out;

	b) the rates of feed of AKF5 during the air emissions stack test; c) the results of the air emissions stack test, including identification of any non-compliance with the conditions of this consent and the EPL; and d) details of additional measures to be implemented to address any non-compliance
K1.4C	Hi Cal 50 and AKF1 are approved for use at the development under this consent subject to the detailed design for any necessary storage facilities and kiln feeding infrastructure being approved to the Secretary. In particular, the detailed design shall: a) demonstrate that the storage facilities would be appropriately bunded in accordance with the relevant Australian Standards, especially Australian Standard AS1940-2004 (for AKF1, this would include having a minimum capacity sufficient to accommodate catastrophic failure of the tank and that adequate measures are in place to ensure a catastrophic failure of a tanker during transfer was adequately contained to ensure no off-site discharge; b) include appropriate measures to ensure liquids draining from the bund (and other containment areas) are kept separate and adequately treated prior to discharge to the onsite stormwater management system, and demonstrate that these measures were developed in consultation with the Sydney Catchment Authority and Wingecarribee Shire Council; and c) include a Fire Safety Study prepared in accordance with the Department's guideline Hazardous Industry Planning Advisory Paper No. 2: Fire Safety Study and in consultation with Fire and Rescue NSW. A construction certificate must not be issued in relation to any necessary storage facilities and kiln feeding infrastructure until the Secretary has approved the detailed design parameters. No Hi Cal 50 or AKF1 is permitted to be received at the site under this consent until any necessary storage facilities and kiln feeding infrastructure have been constructed in accordance with the detailed design parameters approved by the Secretary.

K1.4CA	Notwithstanding condition 1.4C of this consent, the Applicant is permitted to undertake a single trial of chipped tyres in the development, ahead of the construction of storage facilities and kiln feeding infrastructure for AKF5, provided that the trial meets the following requirements: a) no more than 205 tonnes of 2” chipped tyres is to be received at the site for the trial; b) the trial shall be conducted over no more than six months from the date of first receipt of the trial materials, after which any remaining trial materials shall be removed from the site to a facility lawfully permitted to accept the materials; c) the trial shall be undertaken for the purpose of investigating design and operational aspects of the full-scale use of AKF5; d) the trial shall be undertaken in full compliance with the environmental performance standards stipulated in this consent, and the requirements of the Environmental Protection Licence for the site; e) the Applicant shall consult with and meet the requirements of the EPA with respect to undertaking the trial, and shall not commence the trial without the prior written approval of the EPA; f) trial materials shall be stored in an area that is sealed, or otherwise treated to the satisfaction of the Secretary, and away from all potential ignition sources; g) the Applicant shall notify Fire and Rescue NSW prior to the receipt of trial materials on the site, and address any requirements with respect to the safe storage of the trial materials; h) the Applicant shall notify the Secretary, the EPA and the Community Liaison Group prior to the commencement of the trial; and i) the Applicant shall report the status and outcomes of the trial to the Secretary and the EPA on a monthly basis from the date that trial materials are first received on the site until conclusion of the trial.
K1.4D	Only Standard Fuels and the Group 1 Non-Standard Fuel, Hi Cal 50, are permitted to be used at the development during start-up and shut-down.
K1.4E	Non-Standard Fuels are not permitted to be stored at the site for longer than 3 months, except with the written permission of the Secretary.

K1.4F	No Non-Standard Fuel is permitted to be received at, or used at the development, unless it complies with: a) the handling, transporting, sampling, analysis and quality control requirements of this consent; b) any requirements of a licence issued under the Protection of the Environment Operations Act 1997 for the site; and c) the fuel specification for that specific fuel.
K1.4G	Prior to the receipt of the first batch of a Group 1 Non-Standard Fuel from a particular supplier, the Applicant shall certify in writing to the Secretary that the supplier has implemented appropriate quality control and quality assurance procedures to ensure the Applicant's responsibilities under this consent can be met. At the request of the Secretary, the Applicant shall forward a copy of the supplier's quality control and quality assurance procedures to the Department demonstrating how those procedures cause the Applicant to meet the requirements of this consent.
K1.4H	Prior to the receipt of the first batch of a Group 2 Non-Standard Fuel from a particular supplier, the Applicant shall certify in writing to the Secretary that the supplier has met the pre-qualification requirements set out in the approved Quality Assurance and Control Procedure for Receipt and NSW Government Department of Planning and Environment 8 Use of Solid Waste Derived Fuels (Appendix 1 of this consent) and that the Applicant's responsibilities under this consent can be met. At the request of the Secretary, the Applicant shall forward a copy of the supplier's quality control and quality assurance procedures to the Department demonstrating how those procedures cause the Applicant to meet the requirements of this consent.
K1.4I	Prior to the receipt of the first batch of SWDF the Applicant shall develop and submit operational procedures for co-firing SWDF to ensure that the temperature of gas generated in the process is raised to a minimum temperature of 8500C for a minimum of two seconds. Operational procedures must include interlocks in the process control system.
K1.4J	Hi Cal 50 must only be used in Kiln 6 when blended with coal to create a homogenous blend. The concentration of Hi Cal 50 in the blend must not exceed 4%.
K3.20 Non-Standard Fuel Specifications	For each Group 1 or Group 2 Non-Standard Fuel approved for use at the development the Applicant shall provide a fuel specification, to be approved by the Secretary and the EPA prior to the use of that Non-Standard Fuel at the development under this consent. The Non-Standard Fuel specification shall include, but not be limited to, the minimum calorific value and the maximum quantity of all relevant pollutants, particularly the listed pollutants.
K3.21	Based on the Non-Standard Fuel specification specified in condition 3.20 the following Non-Standard Fuel specification criteria are required to be met:

	a) deleted MOD-109-9-2006-i; b) for Hi CAL 50 a mercury specification no greater than 1 mg/kg and a cadmium specification no greater than 10 mg/kg; c) for AKF1 a mercury specification no greater than 2 mg/kg and a cadmium specification no greater than 5 mg/kg; d) organohalogen compounds, expressed as chlorine, in any Non-Standard Fuel not to exceed 1% by weight; and e) the waste materials to be used as Non-Standard Fuels must not be diluted or blended to meet any of the fuel specification requirements.
K3.22 Non-Standard Fuels Pollution Tracking	Prior to the use of any Group 1 or Group 2 Non-Standard Fuels at the development in accordance with this consent, the Applicant shall implement a Tracking Program that meets the requirements of the Secretary. The Tracking Program shall include, but not be limited to, the identification and recording of the following information in accordance with the time periods specified in condition 3.23: a) batch analyses of Non-Standard Fuels received at the development as provided by the suppliers, and the results of any check analyses carried out by the Applicant as part of the quality control management procedures required under condition 6.7 and condition 6.8 of this consent; NSW Government Department of Planning and Environment 13 b) a mass inventory of each listed pollutant entering the process in raw materials, conventional fuels and Non-Standard Fuels, with particular attention to, but not limited to chlorine, mercury, cadmium and chromium; c) emission factors for each listed pollutant calculated from inputs, outputs, and measured air emissions, variance in the emissions factors from period to period and an assessment with regards to the reasons for any such variance; and d) any adjustments that may be necessary to Non-Standard Fuel specifications arising from the Tracking Program analysis.
K3.23	The Applicant shall submit a Report that details and assesses the results of the Tracking Program prescribed in condition 3.22 of this consent to the Secretary. The Report shall be submitted to the Secretary: a) every three months in the first year of operation using Non-Standard Fuels under this consent, (to be synchronised with stack monitoring); and b) thereafter every six months, or as otherwise agreed to by the Secretary.
K3.24 Process Parameters	The Applicant shall cease to burn Non-Standard Fuels in Kiln 6 if: a) the temperature is below 8500C in the zone where Non-Standard Fuels are fired or in the vicinity of the pre-calciner; or

	b) the temperature is below 3000C at the outlet of the preheater strings.
K3.24A	The temperature requirement of Condition 3.24(b) does not apply to the Group 1 Non-Standard Fuel Hi Cal 50, when Hi Cal 50 is blended with coal in accordance with the requirements of condition 1.4J.
K3.24B	Notwithstanding Condition 3.24A, the feed rate of the Group 1 Non-Standard Fuel, Hi Cal 50, must not exceed 400kg/hr when the temperature is below 300^0C at the outlet of the preheater strings.
K3.25	The Applicant must undertake PoP trials for the burning of SWDF. The maximum length of the trial will be eight months. At least one month prior to the PoP trials, the Applicant shall submit a detailed plan(s) for the PoP trials, to the satisfaction of the Secretary. The plan(s) must be prepared for the co-incineration of each permitted SWDF and be prepared in consultation with the EPA. The plan(s) must, as a minimum: a) verify the residence time, the minimum temperature and the oxygen content of the exhaust gas which will be achieved during normal operation and under the most unfavourable operating condition anticipated; b) establish all criteria for operation, control and management of the abatement equipment to ensure compliance with the emission limit values specified in the EPL; c) assess the performance of any monitors on the abatement system and establish a maintenance and calibration program for each monitor; d) establish criteria for the control of all alternative fuel input including the maximum flow and maximum calorific value; e) confirm that all measurement equipment of devices (including thermocouples) used for the purpose of establishing compliance with this approval have been subjected, in situ, to normal operating temperatures to prove their operation under such conditions; f) detail procedures for testing the performance of all major process components and emission control systems associated with the processing and burning of SWDF; and g) address all relevant requirements of the EPL for the project.
K3.26	The PoP trials shall: a) be carried out in accordance with a detailed PoP plan(s) approved by the Secretary; b) be undertaken by a suitably qualified and experienced person(s);

	c) test performance of all major process components including emission control systems using no SWDF, and representative fuels containing SWDF designed to cover the range of materials and compositions of SWDF; d) identify changes to the Kiln 6 emission control system that may be necessary to achieve compliance with the consent and the EPL; and e) demonstrate compliance with the relevant requirements of the EPL, development consent and relevant environmental and safety criteria.
K3.27	The Applicant is to report on each PoP trial to the Secretary and EPA. The reports shall be submitted at: a) monthly intervals during the PoP trial. The information to be contained in these reports is to be determined in consultation with the EPA as part of the PoP Trial Plan required under condition 3.25; and b) six months after the commencement of the PoP trial. The six month report shall contain but not be limited to the following information: i. the total quantity of SWDF used during the previous six months; ii. the dates and times when the trial commenced and will conclude; iii. the results of stack emissions testing for the analytes and properties specified in any relevant trial plan and baseline emissions for comparison, where applicable; iv. all monitoring data collected for the project during the previous six months; v. identification of any non-compliance with the conditions of this consent and the EPL; vi. details of additional measures to be implemented to address any non-compliance; and vii. an assessment of the suitability of the SWDF for ongoing use. Copies of the POP Trial Reports shall be made available to the public upon request.
K3.28	Use of SWDF is not permitted (outside of the approved PoP trials) until such time as the Secretary has indicated in writing that it is satisfied with the results of the six month PoP trial report specified under condition 3.27 b) for an individual SWDF.

K7.3A	In each Annual Management Report submitted after the First Year Monitoring and Modelling Assessment Report required in accordance with condition 7.6 has been submitted, the applicant shall include details of the use of all Non-Standard fuels at the development including but not limited to: a) the nature, quantity and quality of Non-Standard Fuels used at the development b) details of any fuels that did not meed the Fuel Specification, including the source of the fuels and how the rejected fuels were managed or disposed of; c) a review of the results of the Non-Standard Fuels Tracking Program and Non-Standard Fuels Quality Control Management Procedures; and d) the results of all monitoring undertaken in accordance with the requirements of this consent and an assessment of these monitoring results, including comparison of stack emissions against the concentration limits set in condition 3.10.
K7.6	One year after the commencement of the use of Non-Standard Fuels in accordance with this consent, the Applicant shall prepare a First-Year Monitoring and Modelling Assessment Report. The Report shall be submitted to the Secretary, the NSW Department of Health and the EPA not more than 15 months after the commencement of the use of Non-Standard Fuels in accordance with this consent.

Note: (K = Kiln 6, M = Mill 7)

Table 22: Response to non-standard fuels conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K1.4A	The majority of fuel consumed was coal. Small amounts of diesel are used during kiln start-ups. The site commenced the use of SWDF's in August 2018 and continued during the reporting period.	SWDF are now in use. Usage has increase from 21 809t in 2018/19 28 997t in 2019/20 34 767t in 2020/21 34 654t in 2021/22 54 396t in 2022/23 64 815t in 2023/24 99193.73t in 2024/25	Boral undertook a review of the OEMP, to reflect the Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020. A further review of the OEMP was undertaken in relation to the approval of Mod 15 and again in 2025 for Mod 14. The OEMP will continue to be implemented onsite. Tonnages of SWDF are tracked and managed.
K1.4AA	No woodchip has been received as the new road has yet to be constructed.	NA	Requirements of Mod 14 to be met prior to the receival of woodchip.
K1.4AB	SWDF currently limited to <50%	PoP trials to be undertaken should increase above 50% be required. Tests will be undertaken for every 10% increase.	PoP trial undertaken in March 2025 to assess up to SWDF 60% total fuel mass and co-firing with AKF5. A report will be supplied to the EPA and DPHI once results from testing are available.
K1.4B	Storage facilities for AKF5 were approved and constructed in 2023 with the use of tyre chips commencing in September 2023. Stockpile sizes and heights have not exceeded the guideline requirements. Storage is in accordance with the FR NSW	Ongoing management of tyre chips receival and storage facilities.	OEMP was updated and approved by DPE in line with mod 15 requirements. Management systems in place to track tonnages brought to site to ensure compliance with stock piling requirements.

	requirements and are roofed. All documents as required were approved.		
K1.4BA	Use of tyre chips commenced in September 2023 with Stack emission testing undertaken in late November 2023. The report once received was submitted to the DPE.	Emission report found no changes in emission parameters in relation to the usage of tyre chips as an alternative fuel.	6 monthly stack emission testing to be undertaken as per current monitoring plan.
K1.4BB	as above	As above	as above
K1.4C	Compliance was confirmed in the 2007-2008 AEMR.	The site recommenced the use of HiCal50 in 2020/21	
K1.4CA	Boral commenced tyre chip trial in January 2022.	Trials are one-off events that do not display reportable trends.	The trial completed, with Modification 15 approved for the installation and operation of a Tyre Chip Storage area.
K1.4D	No non-standard fuels, apart from the approved HiCal 50, were used during start-up or shut-down conditions.	Apart from HiCal 50, SWDF are currently the only non-standard fuels in use. These are fed into the Calciner and are easily removed during start-up and shut down conditions	Modification 11 was approved on 25 October 2020 which permits the use of HiCal50 when blended with coal at 4% HiCal 50 to 96% coal during start-up and shut down conditions.
K1.4E	Written approval from the Secretary received (4/4/2019) to store up to 17 500t of HiCal 50.	NA	Manage as per approved HiCal50 Storage and Handling Procedure and Hi Cal 50 Recovered Resource Specification.
K1.4F	All non-standard fuels received and used at site are tested to ensure compliance with approved specifications. Independent audit identified no non compliances.		Continue use of standard operating procedure and quality controls that are already in place. Continue Annual independent audit of suppliers.
K1.4G	Boral provided their own procedures for the Group 1 HiCal 50 Specification and Storage procedures as Boral are processing and	NA	NA

	testing for supply. Approval granted by the Secretary		
K1.4H	Boral advised DPHI in June 2024 of the commencement of chipped tyres from a new supplier. Boral had audited the operations and established the required quality processes. In May 2024, Boral advised DPHI and EPA as to the recommencement of the use of AKF1 and a new supplier. Boral had audited the operations and established the required quality processes. Investigations and discussions were ongoing on the quality of the AKF1 and the need for PoP trials.		Boral will continue to review suppliers prior to the receipt of the first batch SWDFs from a particular supplier. DPHI and EPA will be advised
K1.4I	Operational procedures were submitted as part of the PoPT plan process.	NA	NA
K1.4J	HiCal will be blended within the coal blending plant when in use.	NA	NA
K3.20	HiCal50 specification was approved on 4/4/2019. PoPT for SWDF including specification approved 28/8/2018. Tyre specification updated in 2024 to include additional suppliers not always part of the Tyre Stewardship program but that meet the appropriate quality procedures.	NA	NA
K3.21	All non-standard fuels have met the specified non-standard fuel specifications.	Laboratory results received and reviewed on a regular basis with a process in place	Annual audit to continue to review specification data, with ongoing testing and

		where materials are assessed prior to being received if out of specification.	review in place with regular supplier feedback.
K3.22	The Non-Standard Fuels pollutant tracking procedure (SP10-01-10 Non-Standard Fuels Pollutant Tracking Procedure) was issued on 1 March 2003 and a copy was provided to DP&E by email on 2 March 2003. The procedure addresses all requirements of Condition 3.22.		
K3.23	The first Tracking Program report was submitted within two weeks of the first quarterly stack test post PoPT trial approval then every six months following receipt of stack test results.	Six monthly reports continue to be prepared and have been provided.	Reports will continue to be prepared as per the Conditions and supplied to the DPE.
K3.24	This is complied with.	NA	Online system in place and independent audit assesses performance.
K3.25	PoPT plan was approved in consultation with the EPA		
K3.26	The PoPT was approved by the DPE 28/8/2018	PoPT originally was completed during the 2019/20 reporting period.	Further PoPT undertaken increasing to 50%.
K3.27	All PoPT monthly reports and the six monthly report were submitted to the Secretary and the EPA. The reports are available on request.	The PoPT six month report was accepted and approved by the DPE with continual use (with conditions limiting to 40%) of SWDF approved by the Secretary on 23/4/2019.	On 8 October 2021 Boral met with the EPA, including representatives of their air branch to discuss the POPTs. Three PoPT were completed. The submission of the PoPTs was provided on 31 March 2022 and a response to a RfI was provided on 12 May 2022. Further PoPT was completed in June/July 2022 to enable the finalisation of the request to 50%.

			This has been approved by the DPE, with an EPL licence variation pending.
K3.28	The continual use of SWDF was approved by the Secretary on 23/4/2019.		
K3.24B	HiCal is used at the approved rate.		
K7.3A	SWDFs were in use during the reporting period. This material came from the six approved suppliers. Three Wood Waste, one Refuse Derived Fuel and two tyre chip approved suppliers. A total of 99193.73t was used during the reporting period. Weekly meetings are held with suppliers to provide updates on operational demands and to review quality and the contracted specifications. All material met the consented specification during the reporting year. . An independent 3rd party audit was undertaken on QC management procedures of all suppliers in March 2025, with no non-compliances raised. Figure 8 under section 5.3 summarises stack emission test results against the licence limits. All stack tests undertaken during 2024/25 were compliant with licence limits.		
K7.6	A first-year assessment report was submitted in November 2019 to the DPIE.		

Note: (K = Kiln 6, M = Mill 7)

5.8 Visual amenity

The visual amenity consent requirements for Kiln 6 are in conditions 3.18 to 3.19A of Development Consent No. 401-11-2002-i and for Mill 7 in Condition 2.19 of Development Consent No. 85-4-2005-i, which are replicated in Table 23.

Compliance with the construction requirements of the second Kiln 6 pre-heat tower was demonstrated in previous AEMRs. It is demonstrated in Table 24 that the community has not historically lodged complaints about the visual amenity of the site and this continues for the current reporting period.

Table 23: Visual amenity conditions

Number	Condition
K3.18 Visual Amenity Impacts	The Applicant shall ensure that all external lighting associated with the cement works upgrade, and including those lights already erected, is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding properties or roadways. The lighting shall be the minimum level of illumination necessary and shall comply with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.
K3.19	The second pre-heater tower shall be designed, constructed, operated and maintained in a manner that minimises the visual impact to surrounding properties and roadways. Note: The second pre-heater tower shall be built in a manner consistent with that described in the additional information provided (identified in condition 1.2 f)). This includes using the building materials identified and minimising the height of the pre-heater tower.
K3.19A	Operational stockpiling of RDF in the external bale material storage area (identified on Drawing No.GE-B-2278-01 Revision DP, dated 15 January 2015) is limited to periods of extended kiln downtime for maintenance or repair only. RDF for stockpiling must be delivered in plastic wrapped 1 cubic metre bales. Stockpiles must not exceed a maximum height of five metres.
M2.19 Visual Amenity	Impacts The Applicant shall ensure that all external lighting associated with the cement works upgrade, and including those lights already erected, is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding properties or roadways. The lighting shall be the minimum level of illumination necessary and shall comply with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.

Note: (K = Kiln 6, M = Mill 7)

Table 24: Response to visual amenity conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.18 Visual Amenity Impacts	Provision of lighting at the Berrima Cement Works complies with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.	No community complaints regarding light spill have been received during the reporting period – the community has not previously complained about light spill from the site.	A minimum amount of lights must be on during nigh time for safety, however, management measures are implemented to prevent significant light spill from the site.
K3.19	Compliance with this condition has been confirmed previously.	No community complaints regarding light spill have been received during the reporting period – the community has not previously complained about light spill from the site.	Planting of trees for visual screening is effectively shielding the tower from sensitive receivers – this screening will become more effective as plantings mature.
K3.19A	Managed by the site EMP	No community complaints were received in relation to stockpiling	N/A
M2.19 Visual Amenity	Provision of lighting at the Berrima Cement Works complies with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.	No community complaints regarding light spill have been received during the reporting period – the community has not previously complained about light spill from the site.	A minimum amount of lights must be on during nigh time for safety, however, management measures are implemented to prevent significant light spill from the site.

Note: (K = Kiln 6, M = Mill 7)

5.9 Rehabilitation

The Guideline requirement for reporting on rehabilitation activities focuses on mining, however, Development Consent No. 401-11-2002-i and Development Consent No. 85-4-2005-i relate to activities in a cement production facility. On going assessments of further rehabilitation is being undertaken with a focus on management of weeds across the site.

5.10 Community

The community relations conditions for Kiln 6 are in conditions 5.1 to 5.5 of Development Consent No. 401-11-2002-i and in conditions 4.1 to 4.3 of Development Consent No. 85-4-2005-i for Mill 7 (Table 25). Performance for both consents are reported under the conditions for Kiln 6 in Table 26 because the conditions are the largely the same in both consents.

5 community complaints were received during the reporting period, with all complaints, made directly through to the site. The complaints were related to dust with one related to noise. These were addressed individually with each complainant.

The Community Liaison Group (CLG) was re-established during the 2019/20 reporting period with the members endorsed by the DPIE on 30 August 2019.

Two CLG meetings were held during the reporting period on 17 June 2024 and 12November 24. No whole of community meeting was held during the reporting period.

Details of these meetings are held on the (**www.boral.com.au/berrimacement**) website.

Table 25: Community conditions

Number	Condition
K5.1	Subject to confidentiality, the Applicant shall make all documents required under this consent available for public inspection upon request. This shall include provision of all documents at the site for inspection by visitors, and in an appropriate electronic format on the Applicant's internet site, should one exist.
K5.2	Prior to the commencement of construction for the cement works upgrade, the Applicant shall ensure that the following are available for community complaints for the life of the cement works upgrade (including construction and operation): a) a telephone number on which complaints about operations on the site may be registered; b) a postal address to which written complaints may be sent; and c) an email address to which electronic complaints may be transmitted, should the Applicant have email capabilities. The telephone number, the postal address and the email address shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public. These details shall also be provided on the Applicant's internet site, should one exist.
K5.3	The Applicant shall record details of all complaints received through the means listed under condition 5.2 of this consent in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to: a) the date and time, where relevant, of the complaint; b) the means by which the complaint was made (telephone, mail or email); c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect; d) the nature of the complaint; e) any action(s) taken by the Applicant in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the Applicant in relation to the complaint, the reason(s) why no action was taken. The Complaints Register shall be made available for inspection by the EPA or the Secretary upon request.
K5.4	Prior to the use of Non-Standard Fuels at the development the Applicant shall establish a Community Liaison Group that has access to all environmental management plans and monitoring data, environmental reporting and tracking and audit reports required by this consent. The Group shall: a) be comprised of the following, whose appointment has been approved by the Secretary: i) 1 or 2 representatives from the Applicant, including the person responsible for environmental management at the development; ii) 1 representative from Council; and iii) 3 or 4 representatives from the local community. b) be chaired by a representative agreed to by the Group and approved by the Secretary; c) meet a minimum of once in every 6 month period; and d) review and provide advice on the environmental performance of

	the development, including providing comment where necessary on any environmental management plans, monitoring results, audit reports, or complaints.
K5.5	The Applicant shall at its own expense: a) ensure that 1 or 2 of its representatives attend the Group's meetings; b) provide the Group with regular information on the environmental management and performance of the development; c) provide access to independent scientific/technical support to assist member in understanding and interpreting information provided, if requested; d) provide meeting facilities for the Group, where necessary; e) arrange site inspections for the Group, if requested; f) take minutes of the Group's meetings and make these minutes available to the public for inspection within 14 days of the Group meeting, or as agreed to by the Group; g) respond to any advice or recommendations the Group may have in relation to the environmental management or performance of the development; and h) maintain a record and a copy of the minutes of each Group meeting, and any responses to the Group's recommendations, to be provided to the Secretary upon request. Note: The above condition's also cover all elements of conditions 4.1 to 4.3 of the conditions set out for the development on Cement Mills 7.

Note: (K = Kiln 6, M = Mill 7)

Table 26: Response to community conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K5.1	Development Consent No. 401-11-2002-i, Development Consent No. 85-4-2005-i and EPL 1698 are available for inspection on request at the Berrima Cement Works. Current environmental monitoring data under the EPL is available at https://www.boral.com.au/our-commitment/environmental-reporting The site's environmental management plans and some previous AEMRs are available at Boral Cement Works Berrima | Boral	Boral historically and continues to make information available on request at the site and on the site's website.	Boral will continue to make information available on request at the site and on the site's website.
K5.2	Berrima Cement Plant's complaints procedures are documented in the operational environmental management plan and subordinate plans. Contact details for Boral Cement Berrima are included on all site entrance signage, and include a telephone number, postal address and email address. Additionally, contact details are provided on the website Boral Cement Works Berrima | Boral	Boral historically and continues to provide contact information on signs and on the site's website.	Boral will continue to make information available on request at the site and on the site's website.
K5.3	Berrima Cement Plant's complaints procedures are documented in the Operation Environmental Management Plan and subordinate plans. A summary of all complaints (by type) received during this reporting period of 1/05/2024 – 30/04/2025 is provided in Appendix 2. There were 5 complaints, 4 were related to dust, with 1 associated with noise.	The number of complaints has decreased for this reporting period.	Boral will continue to implement the Operational Environmental Management Plan to prevent nuisance impacts on neighbouring properties

			and implement the real-time dust monitor.
K5.4	The community liaison committee (CLC) was originally established in April 2004. Since 2010, the CLC was converted to public meetings, including invitations to the CLC members, as, at the time the CLC format proved unsuccessful in communicating meeting contents and outcomes to the broader community. In 2019/20 the Community Liaison Group was re-established. In 2024/25 the Community Liaison Group met twice. . Notes of meetings and copies of presentations made at the community meetings are sent to all meeting participants and are displayed in the community section of the Berrima website: Boral Cement Works Berrima | Boral	The aim is for the CLG to meet 6 monthly and there will be one whole of community meeting held annually, as required	The CLG met twice during the reporting period.
K5.5	The Berrima Cement Management Team is represented by the Site Operations Manager and the Environmental Sustainability Manager, together with Boral's Stakeholder Relations Manager - Southern Region (NSW/VIC/TAS/SA), and a representative from Boral Cement's Group Engineering Team. Minutes from the CLG meetings have been posted on the website.	Boral has historically, and will continue to, respond to requests from CLG members and post the meeting minutes on the website.	Boral will continue to respond to requests from CLG members and post the meeting minutes on the website.

Note: (K = Kiln 6, M = Mill 7)

6 Independent Audit

Condition 4.5 of the Kiln 6 development consent and Condition 3.3 of Cement Mill 7 development consent require Boral Cement to undertake an independent audit of the site once every three years. Both conditions are nearly identical, and the audit is undertaken as a single operation. Condition 4.5 of the Kiln 6 development consent states:

Within three years of the commencement of operation of the cement works upgrade, and every three years thereafter or as otherwise required by the Director-General, the Applicant shall commission an independent person or team to undertake an Environmental Audit of the cement works upgrade. The independent person or team shall be approved by the Director-General, prior to the commencement of the Audit. An Environmental Audit Report shall be submitted for comment to the Director-General, the EPA and Council, within one month of the completion of the Audit. The Audit shall:

- *be carried out in accordance with ISO 14010 - Guidelines and General Principles for Environmental Auditing and ISO 14011 - Procedures for Environmental Auditing;*
- *assess compliance with the requirements of this consent, and other licences and approvals that apply to the cement works upgrade;*
- *assess the cement works upgrade operations against the predictions made and conclusions drawn in the SEE and other documents listed under conditions 1.2a to 1.2q inclusive; and*
- *review the effectiveness of the environmental management of the cement works upgrade, including any environmental impact mitigation works.*

The Secretary may, having considered any submission made by the EPA and/or Council in response to the Environmental Audit Report, require the Applicant to undertake works to address the findings or recommendations presented in the Report. Any such works shall be completed within such time as the Director-General may agree.

The above wording is replicated in Condition 3.3 of the Mill 7 development consent.

The previous 3-year audit was conducted in November 2020 by Robert Byrnes from International Environmental Consultants.

A subsequent independent audit covering the period 1 November 2021 to 1st November 2023 was commenced in late November 2023 in line with the 3-year period. This audit has included a statistical review of performance data as well as assessment of compliance against conditions of concern. The audit report was issued to the DPHII on the 15th July 2024 with a response on the 10th October 2024 that the audit report generally satisfied the respective conditions of re consent.

The audit concluded …

This audit found that although there was a similar level of non-compliance with the Kiln 6 consent DA401-11-2002-i-MOD15 during the audit period compared to the 2020 Audit, improvements had been made in the management of SWDF within the plant. Additional improvements have also been made with the Electrostatic Precipitator reducing the issue with tripping.

The non-compliances relate to monitoring and management of air emissions required by the EPL which were identified by Boral and reported to both the EPA and DPHI. There was one penalty infringement notice issued by the EPA following a dust event in November 2023, which was outside of the audit period. The EPA had also raised concerns in relation to performance of the Electrostatic Precipitators (ESP) and has sought information from Boral on the potential to replace these with bag filters. It is understood that Boral has now reconditioned the ESP electrical systems which should provide greater reliability. This will be an ongoing discussion and this audit has recommended that Boral study the potential replacement of the ESP and continue discussions with the EPA. The Cement Works has maintained a high level of compliance with its development consents and has met the requirements of all pre-construction conditions and operating conditions. As detailed in the tables in Appendix A, the cement works is complying with all other consent conditions."

It was recommended that…..

ρ *Proactively engage with the EPA to finalise the real-time monitoring program to better establish compliance with noise and dust emission criteria*. A real time monitoring system is now installed with regular reporting to the EPA on its performance.

ρ *Improve the management and life of dust filter bags to avoid burst events.* A proactive maintenance plan is in place to regularly review the performance of the bags.

ρ *Determine measures to further reduce trips on the Electrostatic Precipitator*. This is an ongoing project to review the performance of operations and hence reduce trips on the ESP. Long term plans are reviewing the replacement of this technology if possible.

ρ *Investigation of causes of NOx concentration variability in the stack emissions*. The investigation of Nox concentration has been undertaken. There is a high level of knowledge in regard to Nox levels within the stack emissions usually related to a disruption in the operation of the kiln.

ρ *Continue to seek measures to reduce fugitive dust emissions during high wind events.* The use of the real time dust monitoring system will assist in determining what fugitive emissions may still be an issue during high wind events. The monitors will alarm if trigger levels are reached taking into account wind direction. The Trigger action response plan outlines the required mitigation measures and will be reviewed over the next 12 months.

ρ *Progressively reduce the stockpiled plasterboard in the quarry area until its height is less than the quarry batter to reduce dust generation during high winds.* This stockpile is being reduced as feed to the kiln when is is possible to do so.

ρ *Survey the previous tree planting around the site, remove tree guards and replace tube stock if necessary.* A review of the tree planting is yet to be undertaken. A 3 year plan for the site including assessment of these sites will be done in the next 12 months.

The next Independent audit will cover the period of the 1st November 2023 to 1st November 2026.

7 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

There was one non-compliance reported during the reporting period relating to non-compliances with the sites Environmental Protection Licence 1698 conditions.

Details of non-compliances submitted to the EPA are below.

Licence condition number not complied with ▼
M2.1
Summary of particulars of the non-compliance ▼

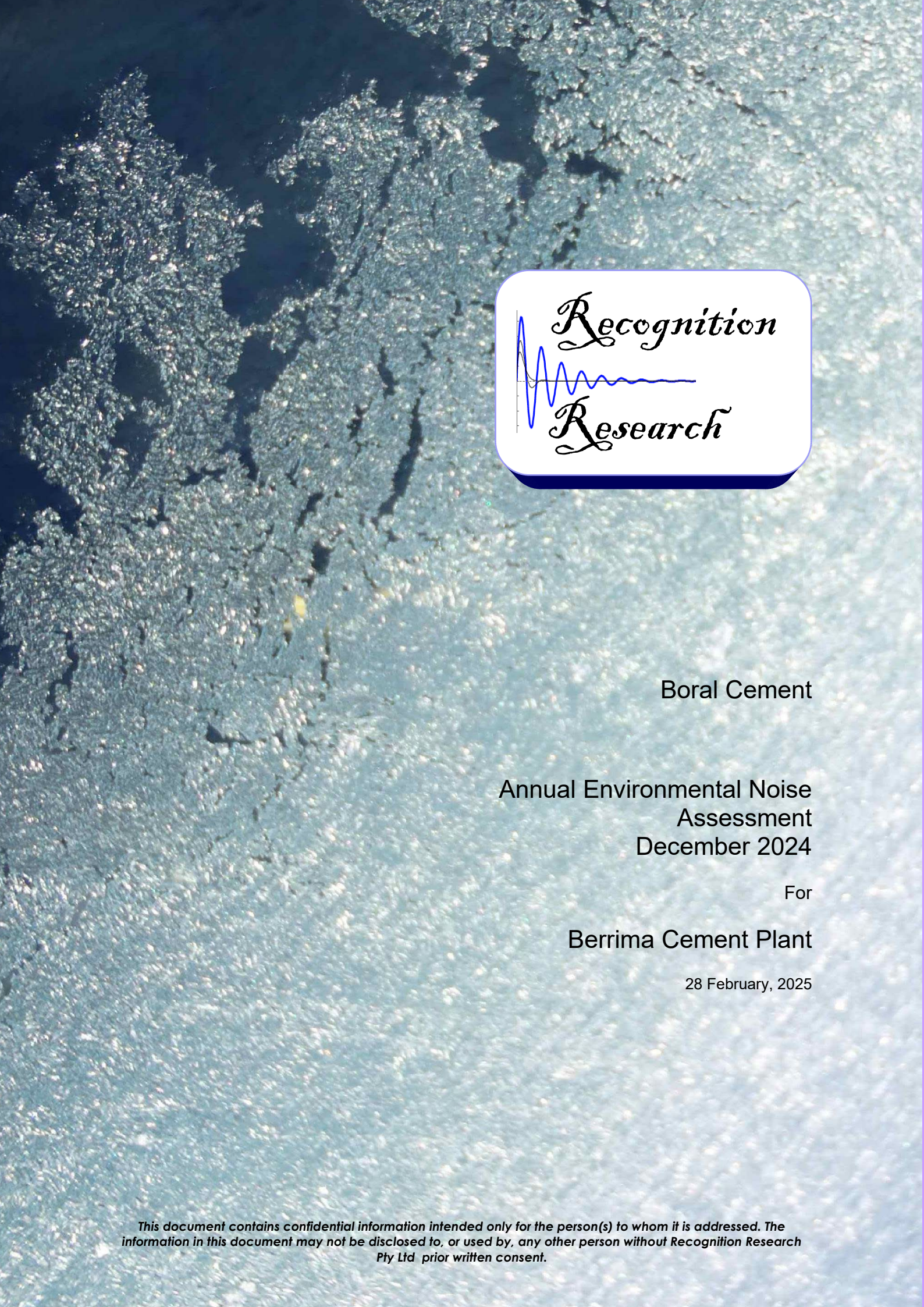
Monitoring frequency for a number of dust deposition bottles not met due to wet weather restricting access and vandalism/theft.
Further details on particulars of non-compliance, if required ▼
Twelve (12) samples are required per site. Monitoring point 11, 12 and 13 - 11 samples only Monitoring point 17 - 10 samples only
Number of times occurred ▼
5
Date(s) when the non-compliance occurred, if applicable ▼
May 2024, June 2024, March 2025,
Cause of non-compliance ▼
Monitoring point 11 - smashed bottle and funnel in March 2025 Monitoring point 12 and 13 - no safe access due to flooding in June 2024 to replace bottle Monitoring point 17 - gauge including the stand was stolen and waiting a replacement May and June 2024
Action taken or that will be taken to mitigate any adverse effects of the non-compliance ▼
No adverse effects of the non-compliance. New bottles and stands have been replaced where necessary. Real-time dust monitors now in place.
Action taken or that will be taken to prevent a recurrence of the non-compliance ▼
New real time ambient monitoring system now installed and in commissioning phase which will be a more accurate tool for identifying dust issues and managing from site. The current deposition gauge network will be reviewed.
Uploaded Document Name ▼
Uploaded Document Description ▼

8 ACTIVITIES TO BE COMPLETED DURING THE NEXT REPORTING PERIOD

During the 2024-25 reporting period, in addition to the annual kiln shutdowns, the following projects will be undertaken or be progressed:

- Review and update OEMP as required
- Implement other Modification 14 approval requirements to allow installation of new road and SWF storage infrastructure, when required.
- Progress trial of real time dust monitoring and alert system.
- Prepare 3 year rehabilitation site plan focussed on already established plantings.

APPENDIX 1 – ANNUAL ENVIRONMENTAL NOISE ASSESSMENT (SEE ATTACHED)



Recognition Research

Boral Cement

Annual Environmental Noise Assessment December 2024

For

Berrima Cement Plant

28 February, 2025

Recognition Research Pty Ltd
Unit 2 No 5 Thalassa Ave
East Corrimal NSW 2518

ABN: 25 153 946 064
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Boral Cement Berrima

Annual Environmental Noise Assessment
November - December 2024

Report of assessment

28 February 2025

RRRep:068

2025.03.31	1	Final Report	Colin Tickell	Stephen Collings		Gabriel Paicu
2025.02.28	0	Final Draft	Colin Tickell	Stephen Collings		Gabriel Paicu
Date	**Rev.**	**Status**	**Prepared By**	**Checked By**	**Approved By**	**Approved By**
Recognition Research						**Client**

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Disclaimer

This report was prepared Recognition Research Pty Ltd, for the sole and exclusive benefit of Boral Cement (the "Owner") for the purpose of assisting the Owner to assess noise at the owner's site at Berrima Cement works, and may not be provided to, relied upon or used by any third party. Any use of this report by the Owner is subject to the terms and conditions of the agreement provided with the proposal RRPR-067 between Recognition Research and the Owner dated 20 August 2024, including the limitations on liability set out therein.

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This report contains the expression of the professional opinion of Recognition Research, based upon information available at the time of preparation. The quality of the information, conclusions and estimates contained herein is consistent with the intended level of accuracy as set out in this report, as well as the circumstances and constraints under which this report was prepared.

However, this report is a review of an existing facility and, accordingly, all estimates and projections contained herein are based on limited and incomplete data. Therefore, while the work, results, estimates and projections herein may be considered to be generally indicative of the nature and quality of the Project, they are not definitive. No representations or predictions are intended as to the results of future work, nor can there be any promises that the estimates and projections in this report will be sustained in future work.

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Executive Summary

The Boral Cement Berrima works has a single noise limit condition for the total site, of $L_{A90,15\text{-minute}}$ not to exceed 58 dBA at Location 20 in the Store Yard. Monitoring for total site emissions at Location 20 over a 15 day period from 27 November to 11 December 20254 has again confirmed that total site emissions are in compliance with the licence condition, as has occurred in all annual surveys since this condition was applied in 2019. Times when that sound level limit was exceeded at the site were caused by weather conditions and extraneous sources not relevant to the compliance assessment.

Sound levels at the plant and in the residential community affected by the noise emissions from the total site have been measured regularly since 2002 and since the completion of each of the Kiln 6 Upgrade and Cement Mill No.7 projects. Monitoring of both residential receiver sound levels and site source sound levels on an annual basis since 2008 has confirmed that both of the projects were in compliance with their noise limit conditions at the time and continue to achieve their objectives.

The annual environmental noise assessment has evaluated noise emission from the Cement Plant by the following methods:

- Monitoring of sound levels at Location 20 for compliance assessment over a two-week continuous period of plant operations;
- monitoring of sound levels in one residential receiver location with unattended monitoring over the same long-term period of two weeks;
- monitoring of sound levels in the North Fence location with unattended monitoring over the same period of two weeks to provide comparisons with the residential receiver and low-frequency and potential for sleep-disturbance at night-time as required by the NSW Noise Policy for Industry;
- attended monitoring in daytime at four residential receiver locations and two site locations to compare with long-term averages from previous years and assess the audible acceptability of the received sound levels;
- listening-attended monitoring from the unattended logger recordings at 4 Melbourne St and the North Fence location during four night periods, three evening periods and two daytime periods, to identify sources contributing to the received sound levels.

The finding of this 2024 annual environmental noise assessment is that total site noise emissions are considered to be in compliance with the licence condition. The licence condition was not exceeded at any time over the two-week monitoring period.

Sound levels from the two major completed projects (Kiln 6 Upgrade and Cement Mill No.7) are also considered to be in compliance with their noise objectives at the nearest residential receiver locations.

It is also the finding of this assessment that the long-term average statistical sound levels have not increased and indicates that the Cement Plant is not increasing its emissions.

Measurements at the North Fence boundary location also assessed potential sleep disturbance and low-frequency impacts according to the 2017 release of the Noise Policy for Industry.

Measurements of the Chloride Bypass Plant (completed in 2023) contribution to received sound levels at Location 20 and the other two locations were included as part of the long-term monitoring results during its operation at various times over the two-week period. Specific assessment of its source contribution emissions was done in 2023 and verified compliance.

Calculations of sleep disturbance potential use $\mathbf{L_{A01.1\text{-}minute} - L_{A90.15\text{-}minute}}$ at night-time to provide comparisons with recommended maximum values for night-time of 60 dBA for $\mathbf{L_{A01.1\text{-}minute}}$ night-time for the Northern Boundary location and not greater than 15 dB difference for $\mathbf{L_{A01.1\text{-}minute} - L_{A90.15\text{-}minute}}$. From the analyses it is considered that the number or times that the objectives of $\mathbf{L_{A01,1\text{-}minute}}$ greater than 60 dBA and $\mathbf{L_{A01.1\text{-}minute} - L_{A90.15\text{-}minute}}$ difference results greater than 15 dB are relatively low and the noise emissions from the Cement Plant have a low potential for sleep disturbance. Only warning signals from train horns, train operations and truck bumps were likely to cause the 60 dBA objective to be exceeded. While the analysis showed there were some 369 events where the objective was exceeded at the monitor, almost all of these were identified as being caused by birds in the early morning period. It is estimated that 95% of the sample had birds as the prominent source, 11% were trucks and 9% were trucks running over a bump in Taylor Ave. 6% of the events observed were impact noise from the Cement Works.

For low frequency assessment, an initial screening test is made of the C-weighted minus A-weighted (L_C-L_A) period sound level exceeding more than 15 dB. If the screening value is exceeded a one-third octave band frequency analyses is then made of un-weighted (or Z-weighted L_Z) sound levels in the low-frequency bands from 10 Hz to 160 Hz, compared to a specific value.

From the measurements in the residential receiver locations, the low frequency assessment was made on the $L_{Aeq,15\text{-}min}$ as per the Noise Policy for Industry. Exceedance of the screening test values were identified on five occasions out of eleven measurements for $L_{eq,15\text{-}min}$ at 4 Melbourne St, one of the two measurements from 12 Brisbane St. and none from the two measurements from Adelaide St.

Of the five detailed assessments of evening and night-time measurements at 4 Melbourne St, four had minor exceedances of the objectives (less than 2 dB), one of these was marginal (less than 0.5 dB) in the 50Hz band. These minor exceedances in the 50 Hz band could be explained to electrical items that were running locally. Comparing to the 2023 LFN assessment, where 4 Melbourne St observed higher levels of low frequency sound between the 40 Hz to 80 Hz and the 160 Hz bands, this 2024 assessment had a significant reduction in sound levels in those bands. The only sound levels observed above that of the objective for residential receiver locations were in the 50 Hz band and 160 Hz band. This indicates that there is less low frequency noise observed in this survey compared to the 2023 Survey.

From the assessment of this survey it is considered that the main source of low-frequency noise events exceeding the policy objectives is from road traffic noise associated with trucks, either from within New Berrima or on distant roads and the freeway. The plant can be a source at times but this is not considered to be significant. Exceedances of the objectives by the L_{90} spectrum levels are considered to be minor.

Site noise sources

Sound levels are measured in 11 areas at locations near major plant items and the near edges of the main plant each year to compare with those of previous years. Some increases were identified in three main areas and these were mostly considered to be related to normal variability in operations. A

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higher sound level near the doorway of RM6 may be related to recent maintenance or unusual conditions and are not expected to cause increased sound levels at residential receivers.

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1 Introduction

Boral Cement Limited operates the New Berrima cement works near Berrima and Moss Vale in the New South Wales' Southern Highlands region. In 2003, approval was granted to construct and operate an upgrade to Kiln 6 at the Site. In 2005, approval was granted to construct and operate No.7 Cement Mill at the site. Both of these developments had conditions of approval which included contribution noise objectives for different receiver areas in the adjacent residential and rural areas. Demonstration of compliance with these contribution objectives was required as a condition of approval for both projects.

Contribution noise objectives for the total Berrima cement works are included in a consolidated Pollution Control Licence for the site, issued in 2019, and revised approval conditions for the projects, issued in early 2020. The licence condition is for sound levels at just one single location. The location is known as Monitoring Location No.20 at the south-eastern corner of the western storage yard. Figure 1.1 shows an aerial view of the cement works and surrounding area, with the locations of Kiln 6 and No.7 Cement Mill and monitoring Location 20 indicated. Figure 1.2 shows an aerial view of the plant immediate locality with boundary environmental noise monitoring locations shown. A plant layout aerial view is shown in Figure 1.3.

Compliance assessment is now based on not exceeding the licence and approval condition of $L_{A90,15\text{-}min}$ not greater than 58 dBA.

In November 2023 a new project was commissioned at the site – the Chloride Bypass Plant. This was subject to an environmental approval with its own contribution sound level limits, which was reported on in 2024. The noise level compliance limits for the total plant did not change.

Noise monitoring of environmental noise and source noise is undertaken regularly on an annual basis in the neighbourhood of the plant and on site. Annual reporting of compliance assessments for the two projects was made from 2007 to 2019. In 2020, compliance assessment included results of monitoring at the single Location 20. Annual environmental noise assessments are provided to the NSW EPA and other statutory authorities.

For the annual assessments, attended monitoring is made at three residential receiver locations during daytime. Unattended monitoring occurs at Location 20 (monitored since 2015), the North Fence location (monitored since 2008) and the residential receiver at 4 Melbourne Street (monitored since 2002). Sound recordings of 15-minute periods during evening and night-time at Melbourne Street and North Fence locations are also reviewed for different day, evening and night periods during the monitoring period to provide a pseudo attended monitoring assessment.

Measurements of sound levels in residential areas of New Berrima and inside the site boundary were obtained from 27 November to 11 December 2024.

During the period of measurements, the Kiln was operating for almost all of the monitoring period with operations for 94% of the monitoring period from 27 November to 11 December. Figure 1.4 shows the non-operating periods and percentage of the monitoring period of major plant items. The longest period of non-operation for Kiln 6 was 6 hours from the 5:00pm to 11:00pm on the evening to night-time of 28 November. RM7 was out of action for 65% of the monitoring period and was not operating from the start of monitoring until 6 December. The Chloride Bypass Plant was also not operating for 64% of the period.

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All of the major items of the whole plant were operating at the same time for a period of 5 hours between 10:00pm on 9 December to 3:00am on 10 December. This period was included in the pseudo attended monitoring.

All major plant items were off at the same time for 87 minutes from 8:15 am to 9:43 am on 6 December.

Operational outages of major plant items during the monitoring period from the morning of 27 November to midnight on 11 December are shown in Table 1.1 below. Figure 1.4 shows the operating times for the whole period and Figures 1.5 to 1.8 show operations for subsequent three to four-day periods.

Table 1.1: Operating outages for major plant items

00:00:00 on 27 November to 23:59:59 on 11 December 2024

Plant item	Total Period off-line	Percent of time off-line From 12am 28/11 to 11:59pm 11/12	No. of stops	Longest off-line
Kiln 6	20 hrs 9 min	5.6%	12	5 hrs 59 min
Raw Mill 6 (RM6)	1 d 23 hrs 54 min	13.3%	19	22 hrs 26 min
Raw Mill 7 (RM7)	9 d 17 hrs 8 min	64.8%	9	8d 13hrs 5 min
Cement Mill 6 (CM6)	4 d 14 hrs 42 min	30.8%	18	2 d 5 hrs 33 min
Cement Mill 7 (CM7)	4 d 20 hrs 56 min	32.5%	24	1 d 16 hrs 5 min
Chloride Bypass Plant	9 d 13 hrs 0 min	63.6%	12	1 d 17 hrs 0 min

Some of these periods may have affected measured sound levels at the residential receivers but most will not. For example for the 4 Melbourne St results, on 6 December 8:15am to 9:45am when all plant items were off at the same time, $L_{A90,15\text{-}min}$ sound levels are 5 to 7 dB lower than those of the period up until 8:00am but similar to several other days at the same time. $L_{Aeq,15\text{-}min}$ in the same period varied from 51 to 58 dBA while those before 8:00am were averaging 53 to 54 dBA and were similar to several other days at the same time. (see Appendix B).

Measurements of continuous sound levels over the period 27 November to 11 December were taken with logging sound level meters at site Location 20, Northern Boundary and residential location 4 Melbourne Street.

Measurements of attended sound levels were made during 15-minute periods in daytime within the monitoring period. Locations monitored were the same as used in previous years. These were:

Residential Receivers:

- 4 Melbourne Street;
- 12 Brisbane Street

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- Corner Adelaide and Taylor at 20m back from the edge of Taylor Ave to be in-line with the front of houses. This location provides the same received sound (or immission) as 72 Taylor Avenue used in previous monitoring.

Cement Plant Site locations

- Northern Boundary
- Location 20 Store Yard (close)

This report provides an assessment of compliance of the current operation of the total Cement Plant site. Results are compared to those taken in 2005, and 2006, then the continuous annual reviews from 2010 to 2023.

Figure 1.1: Boral Cement Berrima Works - Locality and major plant items

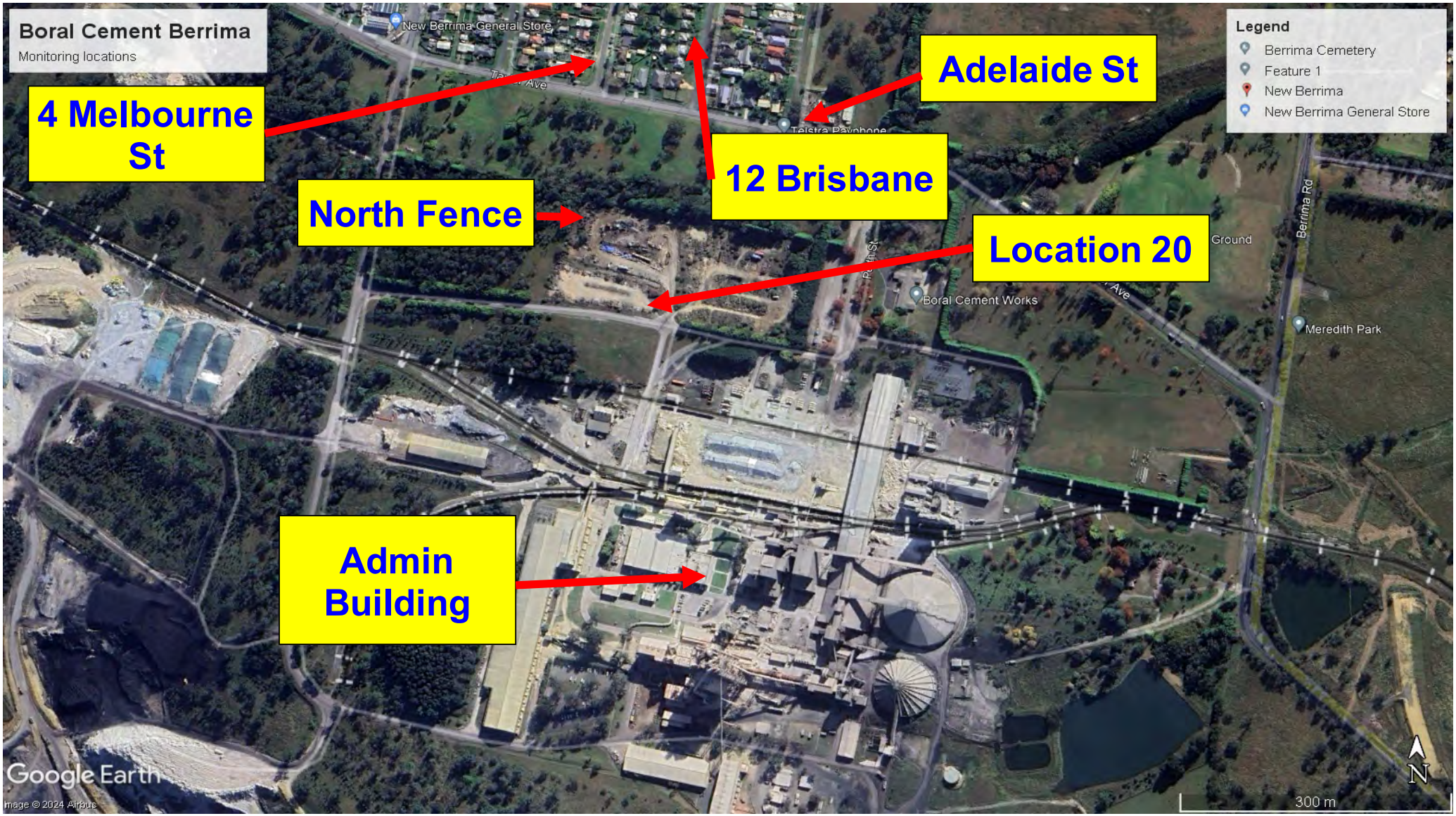


Figure 1.2: Boral Cement Berrima Works - monitoring locations

2024 report location figures.xlsx

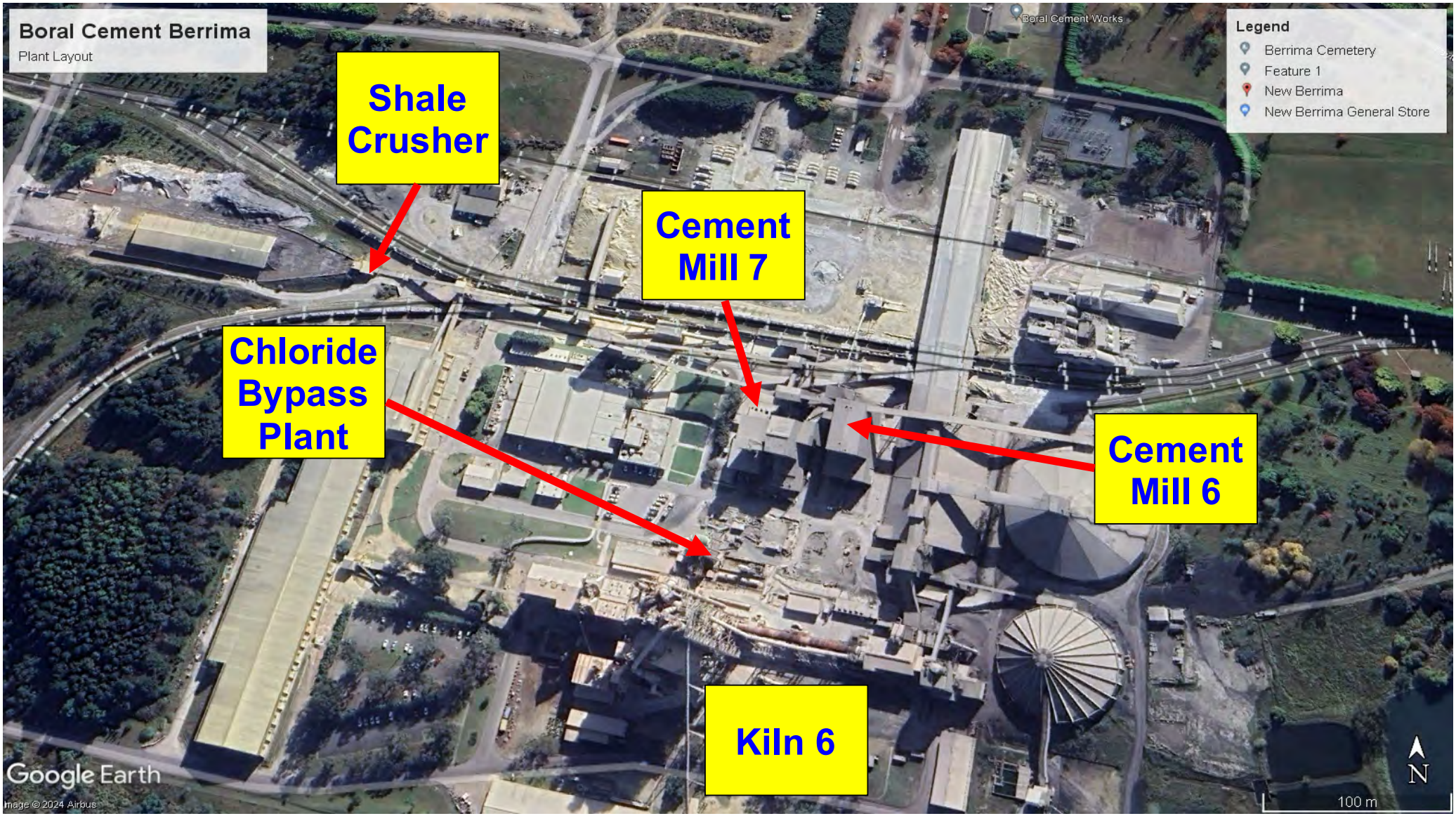


Figure 1.3: Boral Cement Berrima Works - plant layout aerial view

Figure 1.4: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant Noon 27/11 to noon 11/12/2024

Figure 1.5: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 27/11 to 1/12/2024

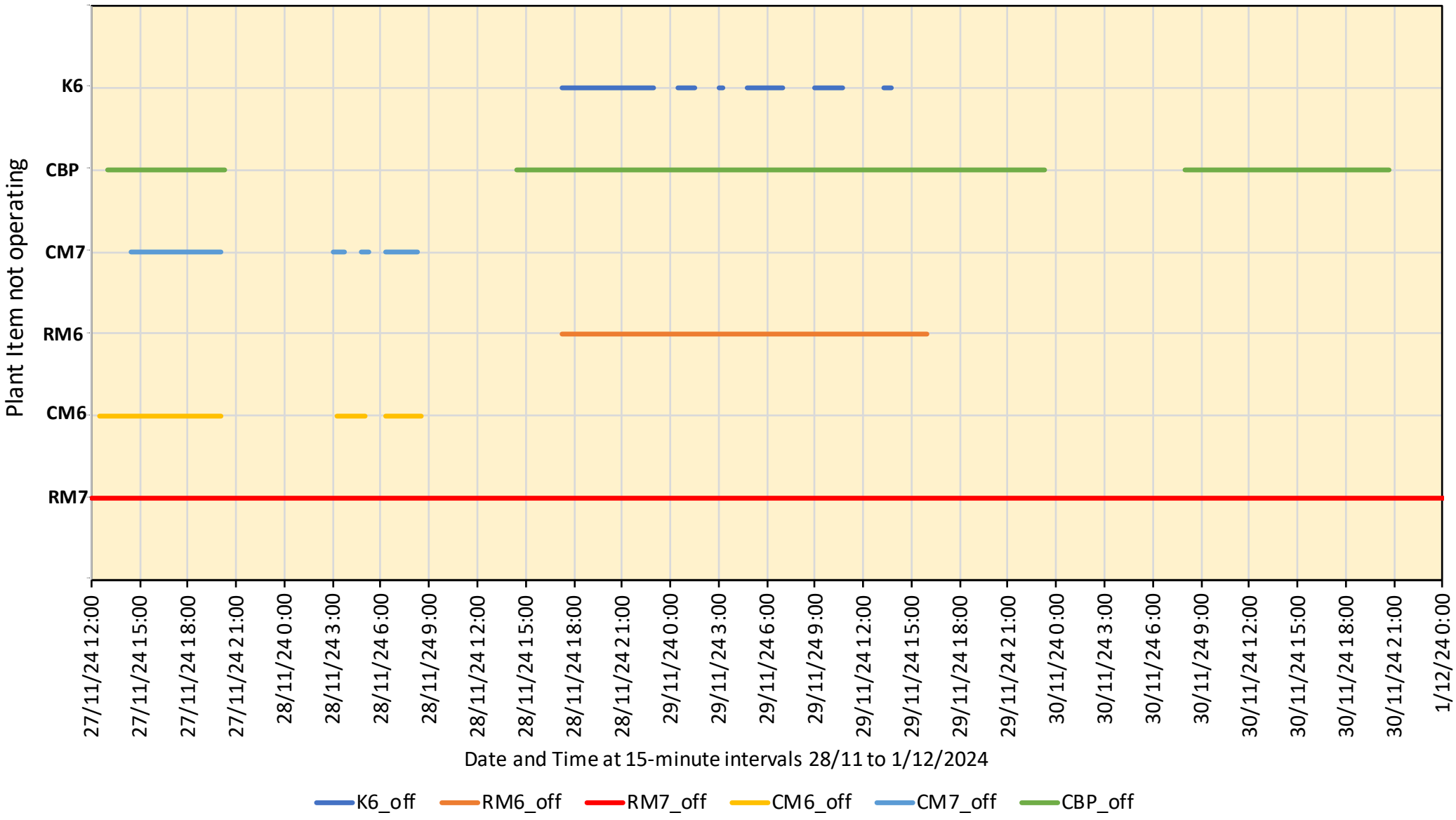


Figure 1.6: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 1 to 4/12/2024

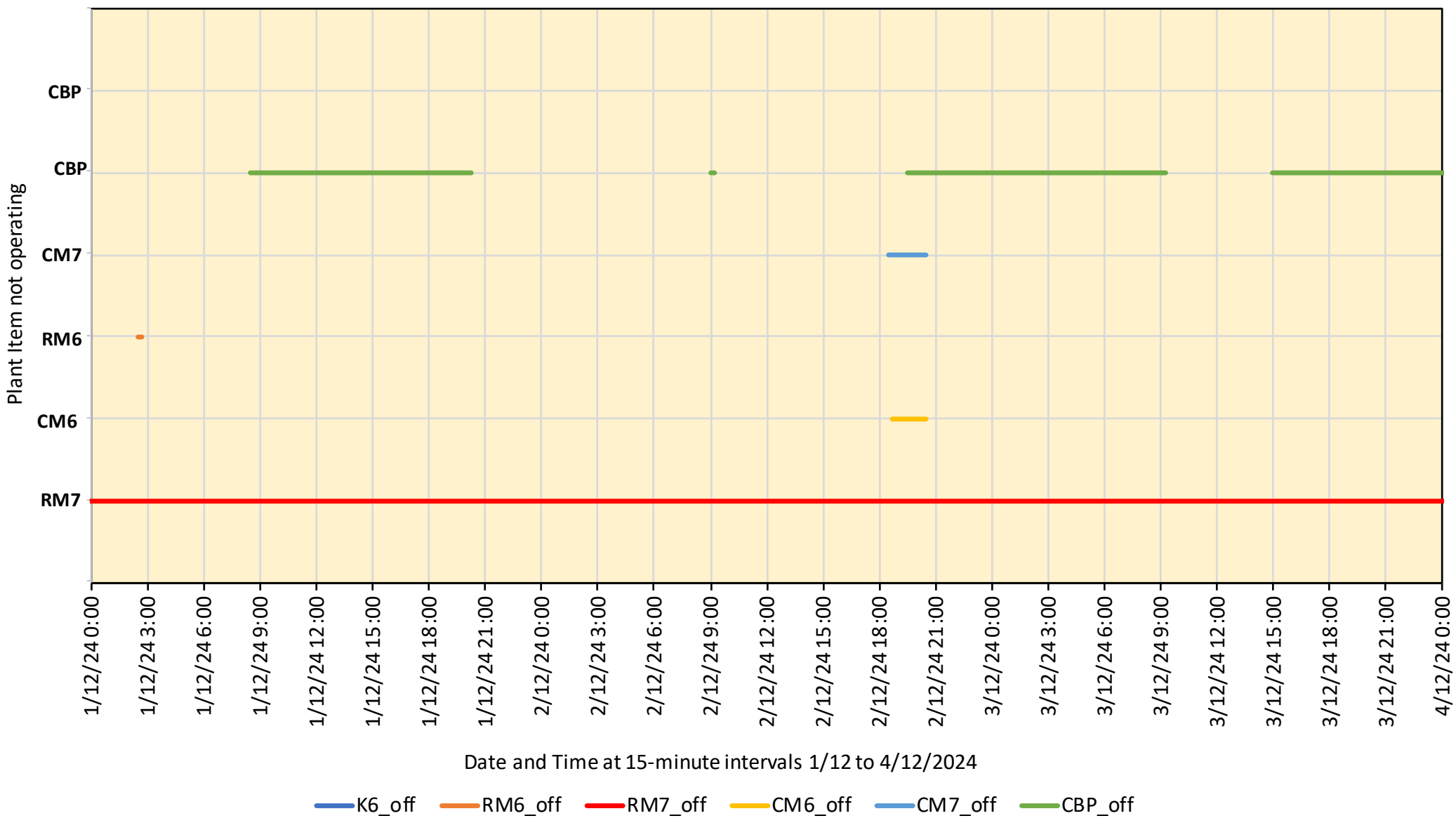


Figure 1.5: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 27/11 to 1/12/2024

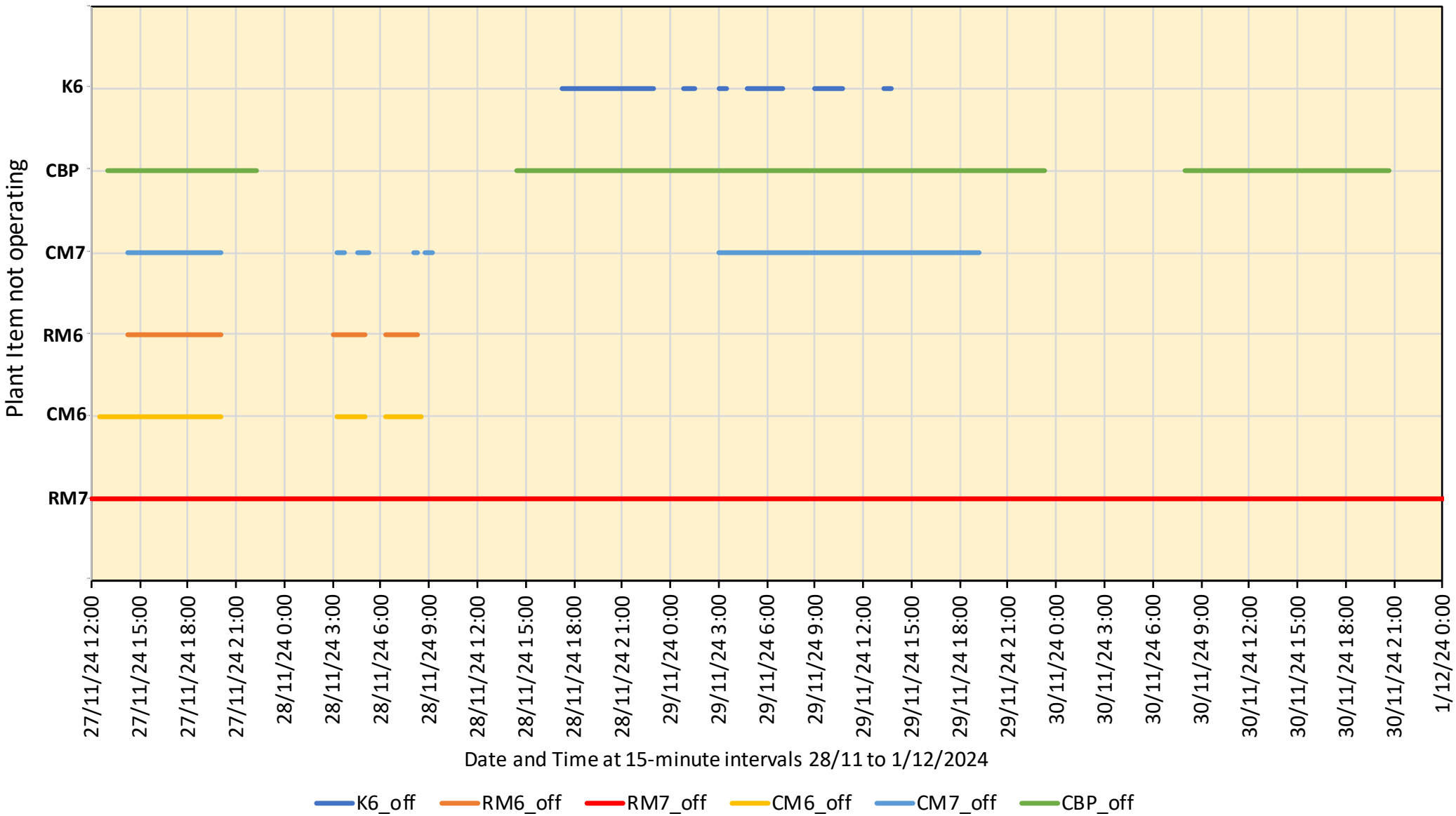


Figure 1.6: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 1 to 4/12/2024

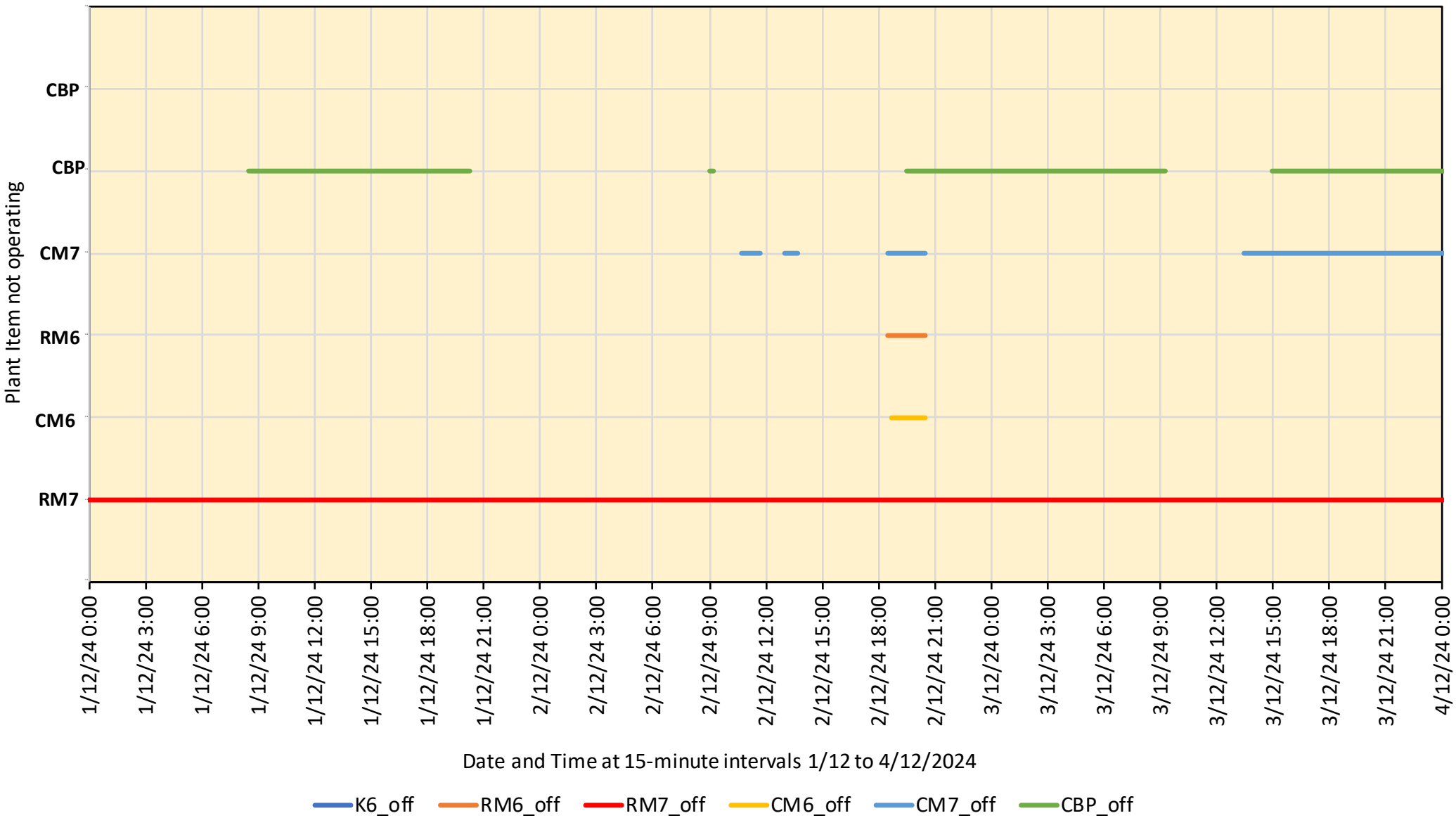


Figure 1.7: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 4 to 7/12/2024

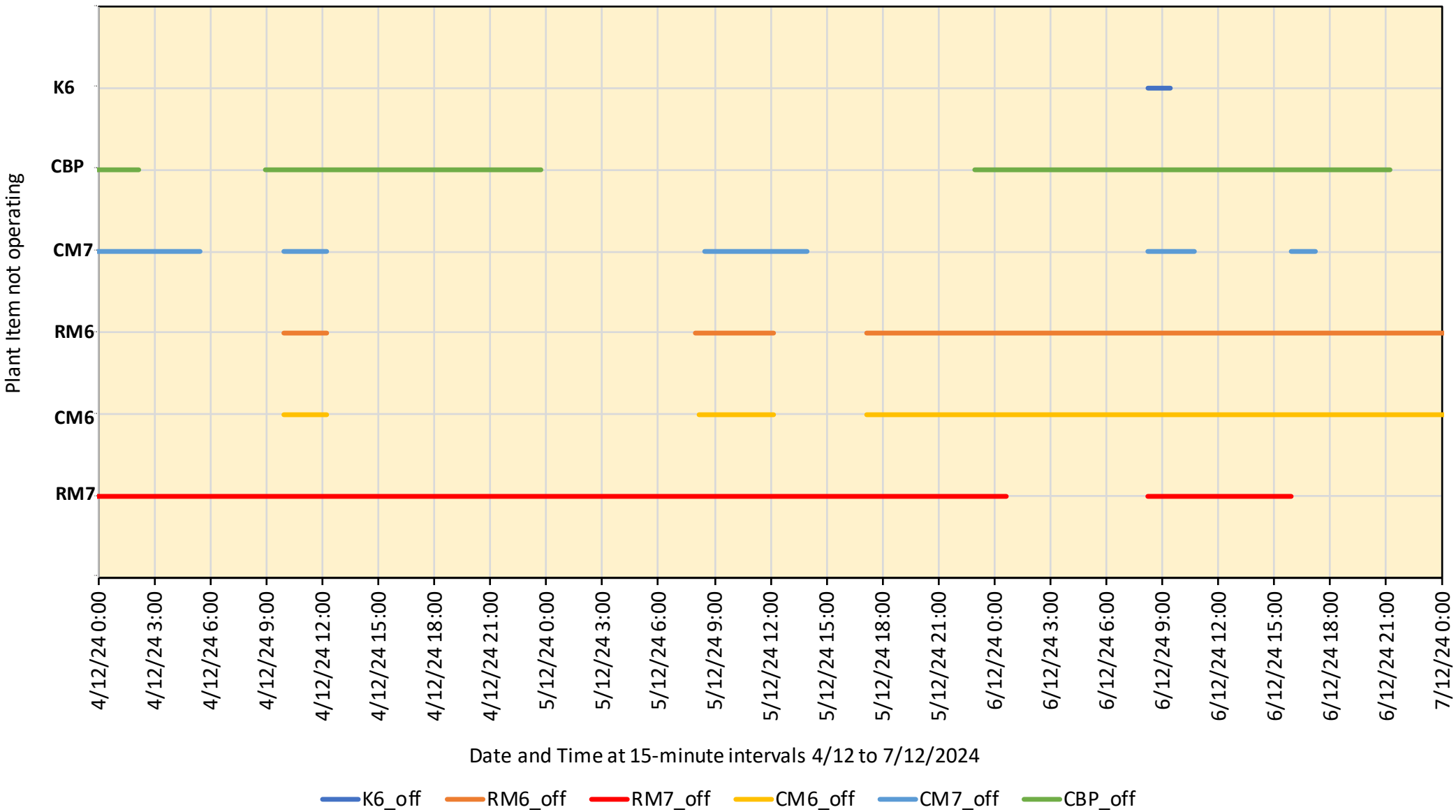


Figure 1.8: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 7 to 11/12/2024

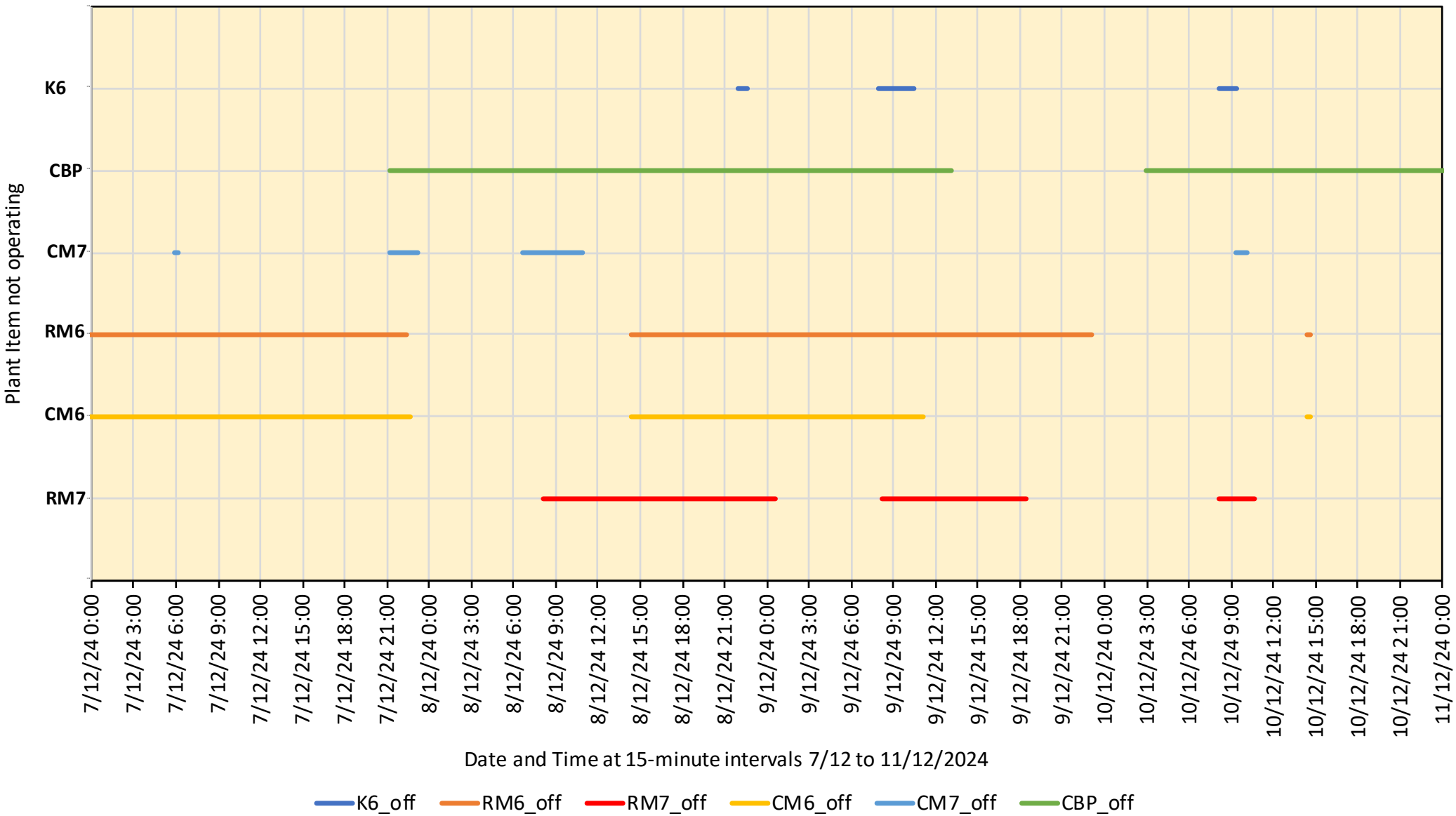


Figure 1.7: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 4 to 7/12/2024

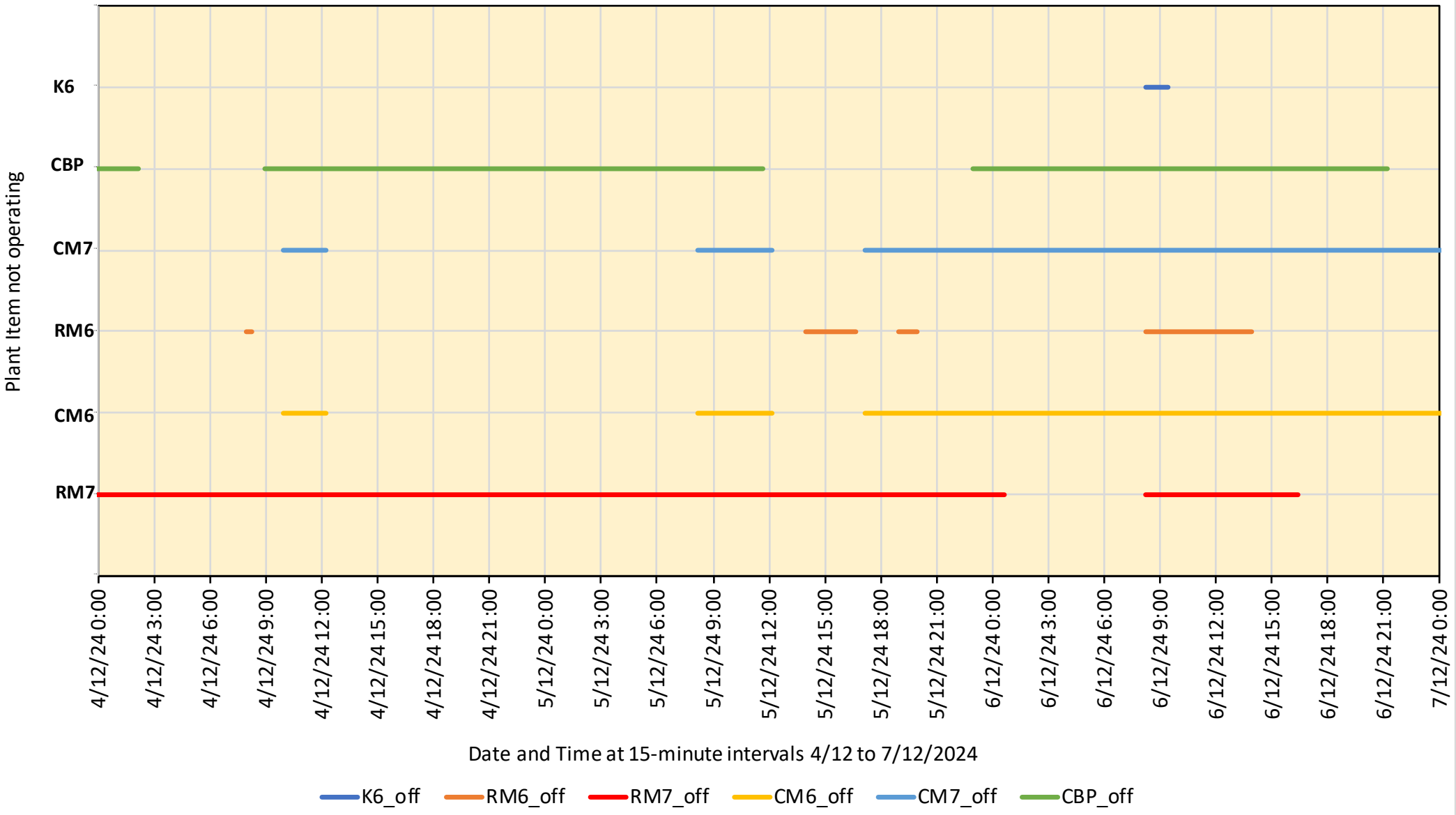
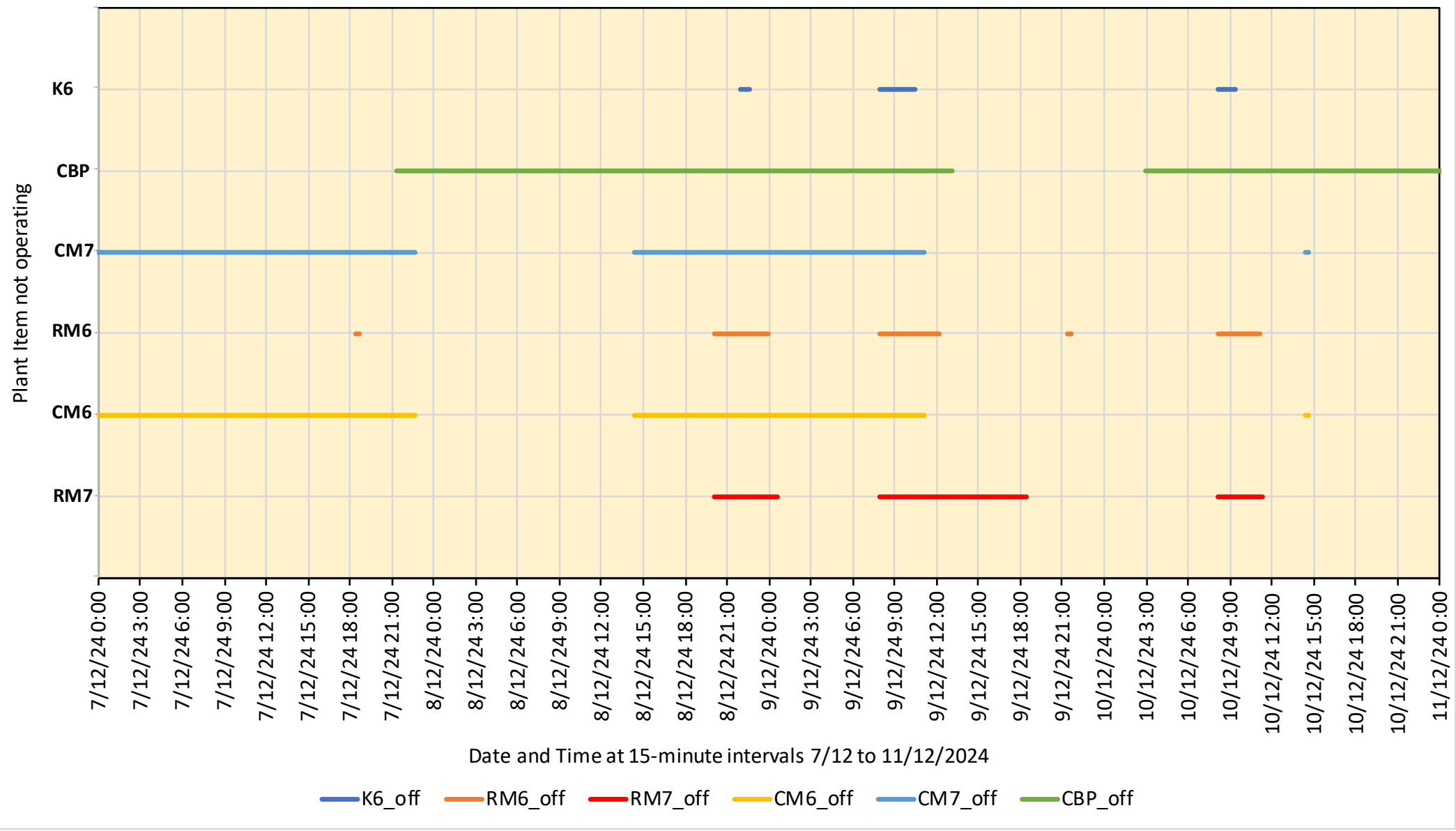


Figure 1.8: Boral Cement Berrima Environmental Noise Assessment 2024 - Non-operational periods of major plant 7 to 11/12/2024



2 Contribution sound level objectives and method of measurement and assessment

2.1 Modification of Development Consent

In 2020 the Development Consent for the site was modified to allow loading of isotainers on the site and set a single site-wide noise limit. The noise limit condition is shown in Table 2.1. From the Consent Modification document. Noise generated at the site must not exceed the noise limits at the times and location specified in Table 2.1 below.

Table 2.1 – Maximum Allowable Noise Contribution Limit (dB(A))

Location	Day $L_{A90\ (15\text{-minute})}$	Evening $L_{A90\ (15\text{-minute})}$	Night $L_{A90\ (15\text{-minute})}$
The noise compliance point Location 20 Store Yard Close	58	58	58

a. Day is defined as the period from 7:00am to 6:00pm Monday to Saturday and 8:00am to 6:00pm on Sundays and public holidays.

b. Evening is defined as the period from 6:00pm to 10:00pm.

c. Night is defined as the period from 10:00pm to 7:00am Monday to Saturday and 10:00pm to 8:00am on Sundays and public holidays

Note: The location of Noise Compliance Point (Point 20) – Store Yard is shown in Figure 1.2, along with the other monitoring locations.

2.2 Chloride Bypass Plant

A Chloride Bypass Plant (CBP) attached to the No.6 Kiln was approved in May 2021 and commissioning was completed on 30 November 2023. The approval conditions included requirements to prepare a Noise Verification Report prior to construction and also within three-months of commencement of operations. An assessment of the noise emissions of the operational plant was made by Recognition Research during the same period as the annual environmental noise assessment and reported in a separate document in early 2024.

Assessment of compliance for the CBP was by measurement of noise source sound levels and modelling of their contribution to the receiver locations in noise propagation enhancing meteorological conditions. That assessment advised that the Chloride Bypass Plant was in compliance with its noise objectives.

The noise objectives for the total plant remain as shown in Table 2.1.

2.3 Method of measurement and assessment

Total plant sound levels

Sound levels of the plant are measured by attended and unattended monitoring methods at Location 20.

Sound levels are also measured at the Northern Boundary to compare with previous measurements and also indicate potential for sleep disturbance during night periods. This is done on the assumption that if the Sleep Disturbance objectives are achieved at the boundary location, they will also be

achieved at the residential receivers, which are 150m more distant from the plant. If the low-frequency spectra indicate relative compliance at the boundary, they will also indicate compliance at the residential locations.

2024 receiver and boundary monitoring

As well as the site noise compliance monitoring, environmental receiver sound levels are measured. The set of measurements for 2024 was done between 27 November and 11 December 2024, with attended measurements on the start and finish days of the survey. The logger at 4 Melbourne St ceased operation at 1:30am on 11 December. As the three logger monitoring locations used recording sound level meters, additional listening "attended monitoring" was done at each location for the same 15-minute periods for (daytime, evening and night-time periods). These periods were:

- Thursday 28 November 00:00 am to 00:15 am Northerly — Night, all plant on except RM7, low speed
- Thursday 28 November 9:00 pm to 9:15 pm CBP, low speed Northerly — Evening, all plant on except RM7, Kiln 6 and
- Monday 2 December 00:00 am to 00:15 am — Night, all plant on except RM7, wind calm
- Wednesday 4 December 00:00 am to 00:15 am CM6, wind low speed 2.5m/s west-south-west. — Night, most plant off except Kiln 6, RM6 and
- Wednesday 4 December 9:00 pm to 9:15 pm CBP, wind low speed 1.0m/s easterly. — Evening, most plant on except RM7 and
- Friday 6 December 2:00 pm to 2:15 pm CM7, wind calm. — Daytime, most plant off except Kiln 6 and
- Tuesday 10 December 00:00 am to 00:15 am — Night-time, all plant on, calm wind
- Tuesday 10 December 2:00 pm to 2:15 pm — Daytime, all plant on except for CBP, calm
- Tuesday 10 December 9:00 pm to 9:15 pm CBP, wind low speed 2m/s north-east — Evening, plant on, all plant on except for

Night and evening periods were selected more than daytime because these are more likely to be periods of potential annoyance and road traffic noise is significantly reduced from daytime.

Results of long-term unattended receiver environmental noise monitoring have also been collated for monitoring undertaken at regular intervals since 2002. Comparison of these results also indicate any trends in receiver location sound levels occurring over the monitoring period since 2002.

Plant source sound levels

Plant source sound levels are measured by attended monitoring in eleven areas around major plant items or plant-edge boundary locations on all sides of the plant. The same locations are used each year to compare with results of previous years to identify if any major sources have significantly increased sound levels.

3. Licence monitoring location and residential receiver sound levels – activities and conditions for 2024

Environmental sound levels are measured at the Licence compliance monitoring Location 20 and at residential receiver locations in New Berrima. A combination of unattended and attended monitoring is used at three locations –

- Location 20 – the Store Yard Close – monitored since 2015
- North Fence – Monitored since 2007
- 4 Melbourne Street, New Berrima – monitored since 2002

Measurements are to assess changes at the locations, acceptability of received sound levels and compliance with the licence conditions.

Attended monitoring is also made at two other residential receiver locations to provide comparisons with previous measurements:

- 12 Brisbane St
- Adelaide St back 20m from Taylor Avenue top match the front façade of 72 Taylor Avenue, monitored previously

Attended measurements were made on 27 November and 11 December 2024 in daytime. As the three logger monitoring locations used recording sound level meters, additional listening "attended monitoring" was done at each location for the same 15-minute periods for (daytime, evening and night-time periods). The times of these periods were noted in the previous section.

3.1 Unattended measurements

Unattended measurements were made using logging sound level meters at 3 locations, shown in Figure 1.2:

- Residential:
  - 4 Melbourne Street, New Berrima (full results provided in Appendix B).
- Boral Cement industrial site:
  - Northern Boundary at the north-western corner of the Stores Yard (full results provided in Appendix C).
  - Location 20 at the south-western corner of the Stores Yard, north of the internal cross road north of the Fettler's Shed (full results provided in Appendix D).

Monitoring instruments measured the sound levels continuously and stored the statistical results every 15-minutes. The loggers at the three locations also store all of the sound levels to allow processing of other parameters, such as $L_{A01.1\text{-minute}}$. The logger at Location 20 also stored directional information of sound level quality from which the direction of a significant source can be identified.

During the period of measurements, major plant items were idle at different times, including the Kiln. Table 1.1 shows the times of non-operation of the major plant items and Figures 1.4 to 1.8 show the operating periods graphically. Some of these periods will have affected measured sound levels at the residential receivers and some will not.

There were three periods with all plant items not operating at the same time and two with them all operating at the same time:

- All major plant items off at the same time on 6 December for 87 minutes between 8:15 am and 9:43 am; on 8 December 54 minutes from 9:48pm to 10:42pm; on 9 December 2 hours 43 minutes from 8:00am to 10:43am.
- All major plant items on at the same time for a period of 5 hours between 10:00pm on 9 December to 3:00am on 10 December

Statistical sound level parameters measured include the following:

$L_{Aeq.15\text{-}minute}$ The equivalent A-weighted continuous or time averaged sound level over each 15-minute period as units of dB. This single sound level represents the equivalent of the sound energy in all of the sound levels in the period, using a logarithmic average. This value is compared with objective sound levels for amenity and intrusiveness.

$L_{A90.15\text{-}minute}$ The 90% exceedance sound level over a 15-minute period. This is the sound level exceeded for 90% of the time or 13.5 minutes in each 15-minute period. It is often referred to as the background sound level and is used for comparison with objectives.

$L_{A01.1\text{-}minute}$ The 1% exceedance sound level over a 1-minute period. This is the sound level exceeded for 1% of the time or 0.6 seconds in each minute. It is used for assessment of typical maximum night-time sound levels and for comparison of the **$L_{A01.1\text{-}minute}$ - $L_{A90.15\text{-}minute}$** difference with a maximum 15 dB difference objective for not causing sleep disturbance.

From these parameters, long-term averages are calculated for each period of day, evening and night in a 24-hour period, then averages or medians of these are obtained for the full length of the measurement periods of 15 days.

$L_{AEQ.period\ average}$ this is the energy average of the period (day, evening or night) L_{AEQ} for all of the periods monitored

$L_{A90.average}$ this is the arithmetic average of the average period $L_{A90.15\text{-}min}$ for the periods monitored.

10%$L_{A90.average}$ this is the median of the period 10% $L_{A90.15\text{-}min}$ for the monitoring period

3.2 Weather conditions

Weather is measured at the site meteorological station, located to the south of the Raw Materials Store.

A summary of the weather conditions for the period 27 November to 11 December when the monitoring was done is shown in Figure 3.1, with those relevant to noise propagation and measurement (wind speed, wind direction and rainfall) shown in Figure 3.2. The datalogger for the weather monitoring had failed on 11/12/24) and it seems that prior to failing it set the time recording to 30 mins from 9/12/24. The 15-minute data shown from 9 to 10 December has been interpolated from the 30-minute data.

Wind speed and rainfall are shown in Figure 3.3, wind direction is shown on Figure 3.4. Weather conditions for subsequent groups of three-day periods are shown in Figures 3.5 to Figure 3.9.

Daytime temperatures ranged from mild to hot, with daytime maxima from 17ºC to 30ºC. Night-times were cool to warm with minimums in a range of 10ºC to 19ºC.

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Nights were also very humid with maximum relative humidities rH 90% to 100% regularly, while days also had both high humidity maxima and low down to 25%. These conditions are typical of late autumn and early summer.

Rain occurred in 75 of the 15-minute periods on eight days, with a maximum of 19mm on 30 November and 4mm in one 15-minute period. More than 1.0mm fell in 12 periods and more than 0.5mm fell in each of seven other 15-minute periods. In total 61.5mm fell from 27 to 10 December. Most of the rain fell between 11:45am on 29 November and 5:30pm on 30 November when 40.5mm fell. There were 6 days without any rainfall.

Wind speeds were from calm to a maximum average wind speed of 6.9 m/s and a maximum of 11.5m/s in a gust in the same period at 11:45 am on 1 December. The maximum average speed in any 15-minute period was 10.9 m/s There were 206 of the 1344 15-minute periods (or 15.3%) of calm wind and 20.8% of periods in the range from 0 to 0.1m/s. Tables 3.1 to 3.3 and Figures 3.10 to 3.21 present the wind direction and speed range data as two different forms of graphs.

Most of the time – 18%, the wind speed range was 2 to 3m/s. The main directions of the wind were West-South-West and North-west to North-east. For day periods combined (7:00am to 7:00pm), 17.6% of periods were calm, while 13.1% of night periods (7:00pm to 7:00am) were calm. For wind speeds less than 0.5m/s, this occurred for 15% of day periods and 14% of night periods. This indicates there was wind for most of the time. Higher wind speeds of greater than 5m/s occurred for 1.6% of days and less than 0.2% of nights. These conditions were slightly lower wind speeds compared to those of 2023.

Wind direction was mainly from the northerly and westerly quadrants over the whole period with only 5% from the southerly quadrant (SW to SE). This was similar for both day and night periods.

Normally data for high wind speed periods greater than 10m/s are discarded as it is likely wind speeds at or close to the microphones would be above 5m/s. However, there were no periods when the average wind speed exceeded 7m/s.

During very low wind speed periods the wind direction was variable but mainly northerly. Westerly winds assist with enhancing noise propagation from the Hume freeway to New Berrima but are not significant for propagation from the Cement Plant towards New Berrima. A total of 75 periods were deleted for rain.

Table 3.1: Boral Cement Berrima Annual Environmental Noise 2024 - Wind speed range and direction frequency 27/11 to 10/12/2024 - 24-hour basis

Speed Range	Percentage of Time in Wind speed range m/s and Cardinal Wind Direction																
m/s	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Grand Total
0	15.3%																15.3%
0.01 to 0.1	0.67%	0.37%	0.15%	0.15%	0.30%	0.15%	0.07%	0.00%	0.07%	0.22%	0.22%	0.52%	0.30%	0.67%	0.74%	0.52%	5.13%
0.1 to 0.5	0.89%	0.30%	0.22%	0.30%	0.30%	0.37%	0.30%	0.45%	0.30%	0.15%	0.67%	0.89%	0.97%	0.82%	1.04%	1.56%	9.52%
0.5 to 1.0	0.97%	0.89%	0.45%	0.74%	0.30%	0.22%	0.45%	0.07%	0.15%	0.15%	0.52%	1.12%	0.82%	1.34%	1.12%	1.19%	10.49%
1.0 to 1.5	1.19%	0.52%	0.37%	1.04%	1.19%	0.60%	0.00%	0.00%	0.15%	0.07%	0.60%	1.56%	0.97%	1.04%	1.56%	1.41%	12.28%
1.5 to 2	1.93%	1.19%	0.67%	0.74%	2.08%	0.30%	0.00%	0.00%	0.07%	0.22%	0.52%	1.49%	1.04%	0.67%	1.26%	2.31%	14.51%
2 to 3	1.93%	3.27%	1.86%	0.97%	0.67%	0.37%	0.00%	0.00%	0.00%	0.00%	0.89%	3.50%	1.34%	0.74%	0.74%	2.01%	18.30%
3 to 4	3.27%	0.37%	3.42%	0.30%	0.07%	0.07%	0.00%	0.15%	0.07%	0.00%	0.67%	2.53%	1.12%	0.52%	0.00%	0.97%	13.54%
4 to 5	0.97%	0.07%	0.82%	0.07%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.37%	0.89%	0.30%	0.00%	0.00%	0.15%	3.72%
5 to 7	0.07%	0.22%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	0.30%	0.00%	0.00%	0.00%	0.00%	0.89%
Total	11.90%	7.22%	8.11%	4.32%	4.99%	2.08%	0.82%	0.67%	0.82%	0.82%	4.61%	12.80%	6.85%	5.80%	6.47%	10.12%	88.39%

Table 3.2: Boral Cement Berrima Annual Environmental Noise 2024 - Wind speed range and direction frequency 27/11 to 10/12/2024 - Daytime 7am to 7pm

Speed Range	Percentage of Time in Wind speed range m/s and Cardinal Wind Direction																
m/s	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Grand Total
Calm	17.60%																17.6%
0.01-0.5	1.0%	0.6%	0.4%	0.7%	0.3%	0.4%	0.3%	0.1%	0.3%	0.6%	1.3%	2.1%	2.1%	1.9%	1.3%	1.2%	14.9%
0.5-1	1.0%	1.0%	0.4%	0.9%	0.1%	0.3%	0.4%	0.0%	0.0%	0.1%	0.6%	1.3%	1.5%	0.9%	0.3%	0.4%	9.5%
1-1.5	0.3%	0.3%	0.1%	1.2%	1.6%	0.4%	0.0%	0.0%	0.1%	0.1%	0.7%	1.8%	1.3%	0.4%	0.1%	0.6%	9.4%
1.5-2	1.5%	0.0%	0.1%	1.0%	3.0%	0.4%	0.0%	0.0%	0.0%	0.1%	0.1%	1.5%	1.2%	0.7%	1.3%	1.2%	12.4%
2-3	1.5%	0.6%	0.6%	0.9%	1.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0.9%	2.7%	1.6%	0.7%	1.2%	2.5%	15.3%
3-5	3.4%	0.3%	5.1%	0.4%	0.1%	0.1%	0.0%	0.3%	0.1%	0.0%	1.3%	3.9%	1.6%	0.6%	0.0%	1.9%	19.3%
>5	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	0.0%	0.0%	1.6%
Grand Total	8.93%	3.13%	7.14%	5.21%	6.55%	2.53%	0.74%	0.45%	0.60%	1.04%	5.36%	13.84%	9.38%	5.36%	4.32%	7.89%	100.0%

Table 3.3: Boral Cement Berrima Annual Environmental Noise 2024 - Wind speed range and direction frequency 27/11 to 10/12/2024 - Night-time 7pm to 7am

Speed Range	Percentage of Time in Wind speed range m/s and Cardinal Wind Direction																
m/s	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Grand Total
0.00	13.1%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.11%
0.01-0.5	2.1%	0.7%	0.3%	0.1%	0.9%	0.6%	0.4%	0.7%	0.4%	0.1%	0.4%	0.7%	0.4%	1.0%	2.2%	3.0%	14.4%
0.5-1	0.9%	0.7%	0.4%	0.6%	0.4%	0.1%	0.4%	0.1%	0.3%	0.1%	0.4%	0.9%	0.1%	1.8%	1.9%	1.9%	11.5%
1-2	4.5%	3.1%	1.8%	1.3%	1.9%	0.9%	0.0%	0.0%	0.3%	0.3%	1.3%	2.8%	1.5%	2.2%	4.2%	5.7%	31.8%
2-4	4.8%	6.3%	4.8%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	5.5%	1.6%	1.2%	0.3%	1.5%	28.0%
>4	0.7%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%
Total Time	12.9%	11.2%	7.4%	3.3%	3.3%	1.6%	0.9%	0.9%	1.0%	0.6%	3.1%	10.0%	3.7%	6.3%	8.6%	12.1%	100.0%

Figure 3.1: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather

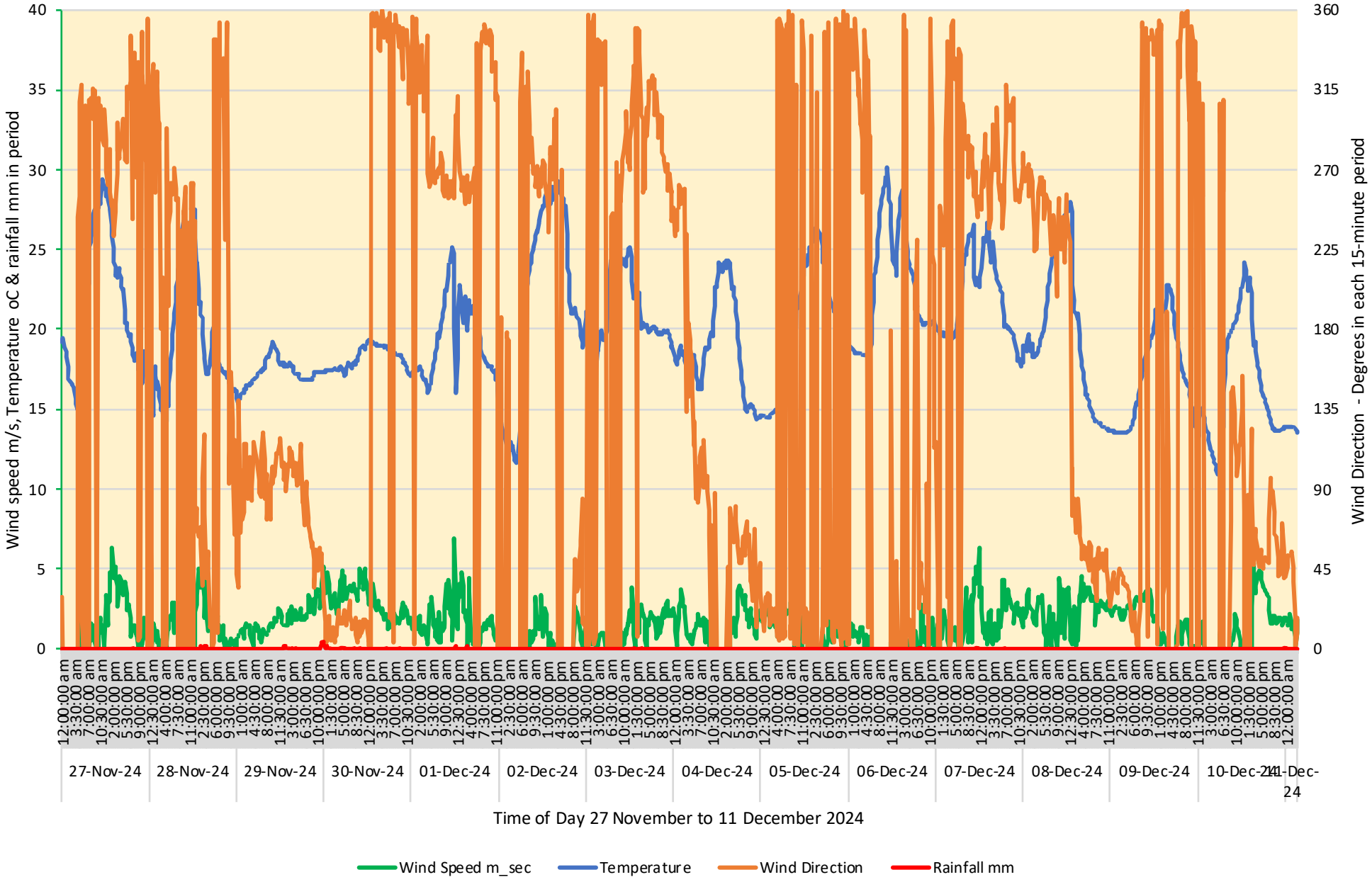


Figure 3.2: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 27/11 to 11/12/2024

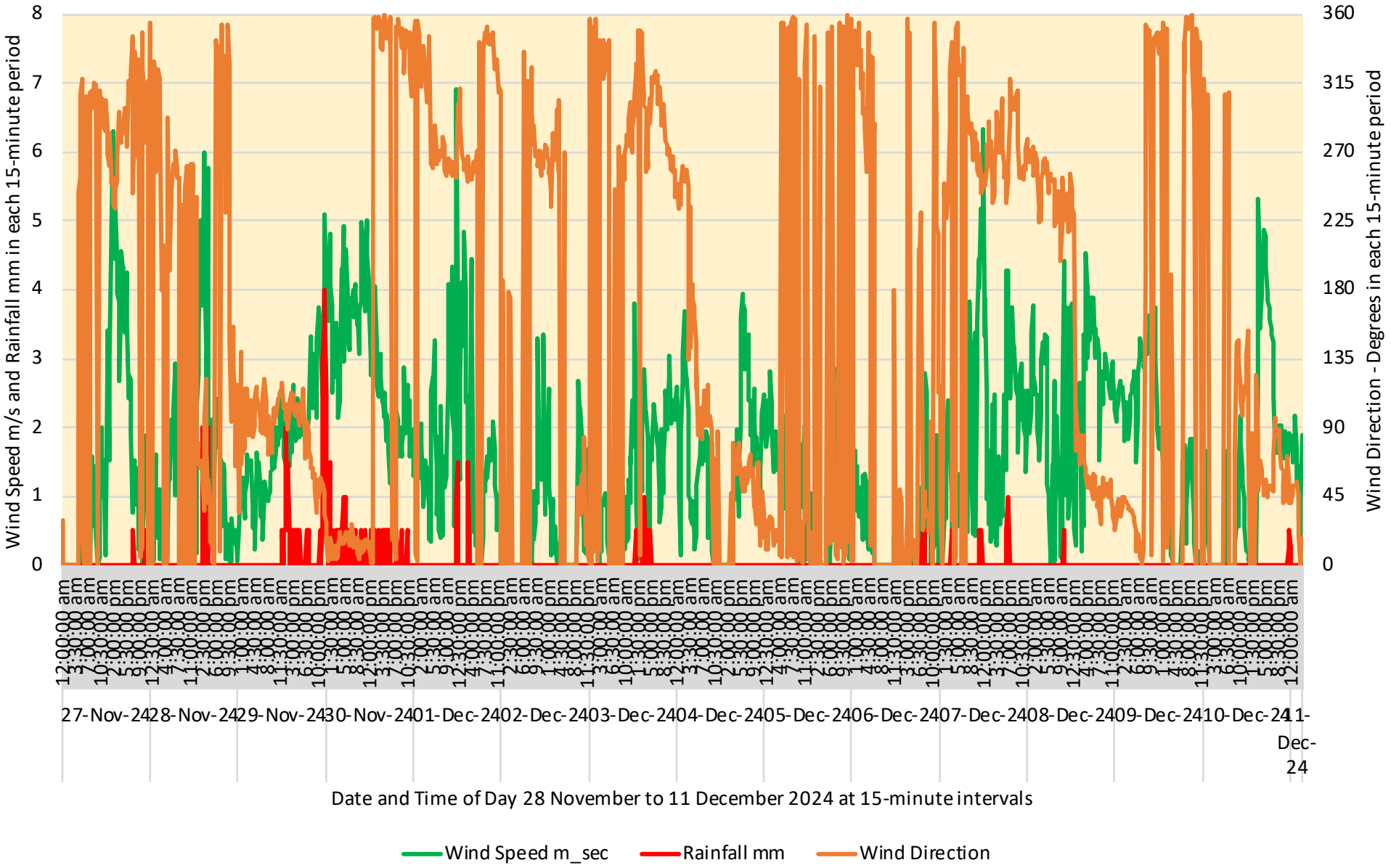


Figure 3.3: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 27/11 to 11/12/2024 Wind speed and rainfall

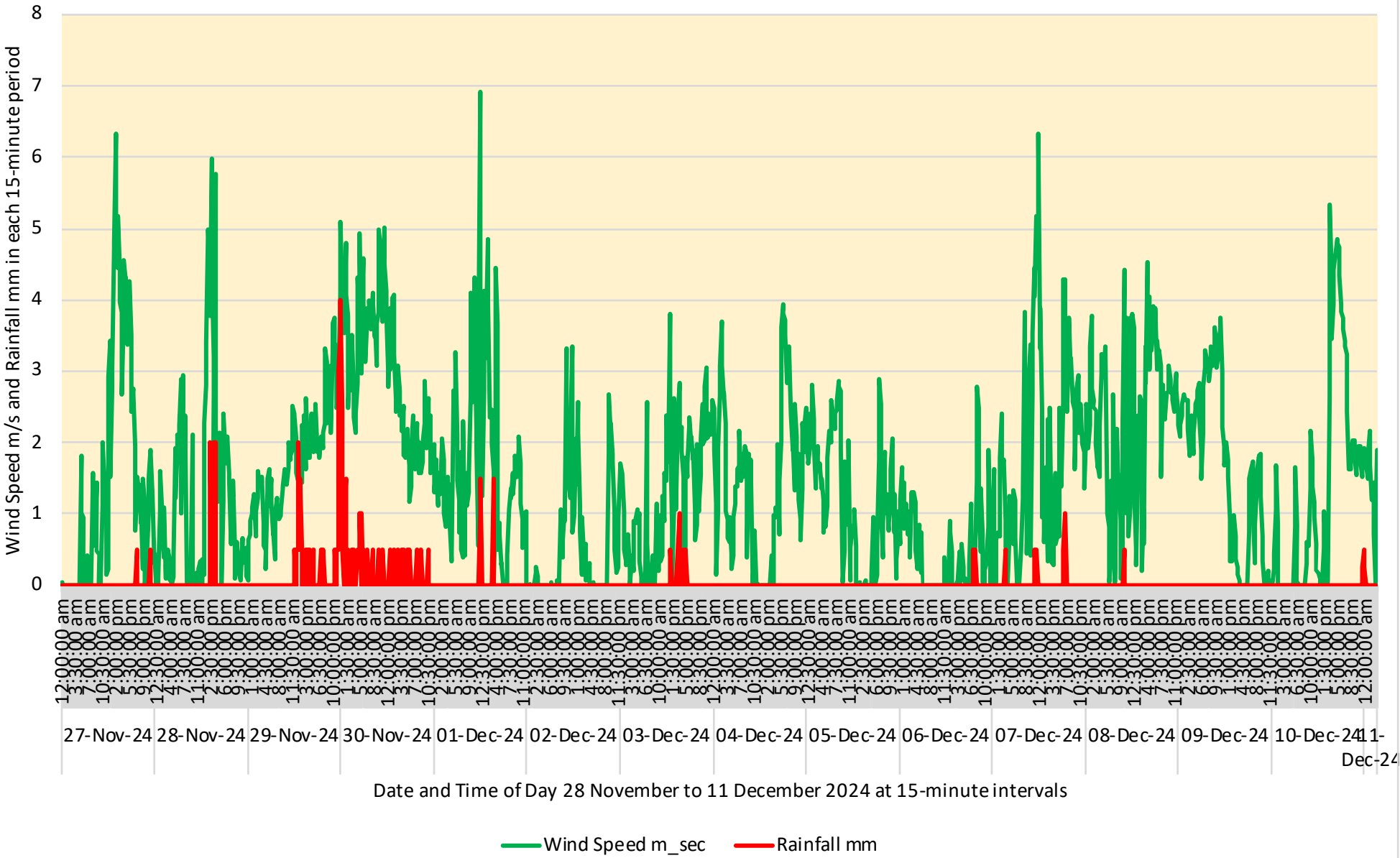


Figure 3.4: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 27/11 to 11/12/2024 Wind direction

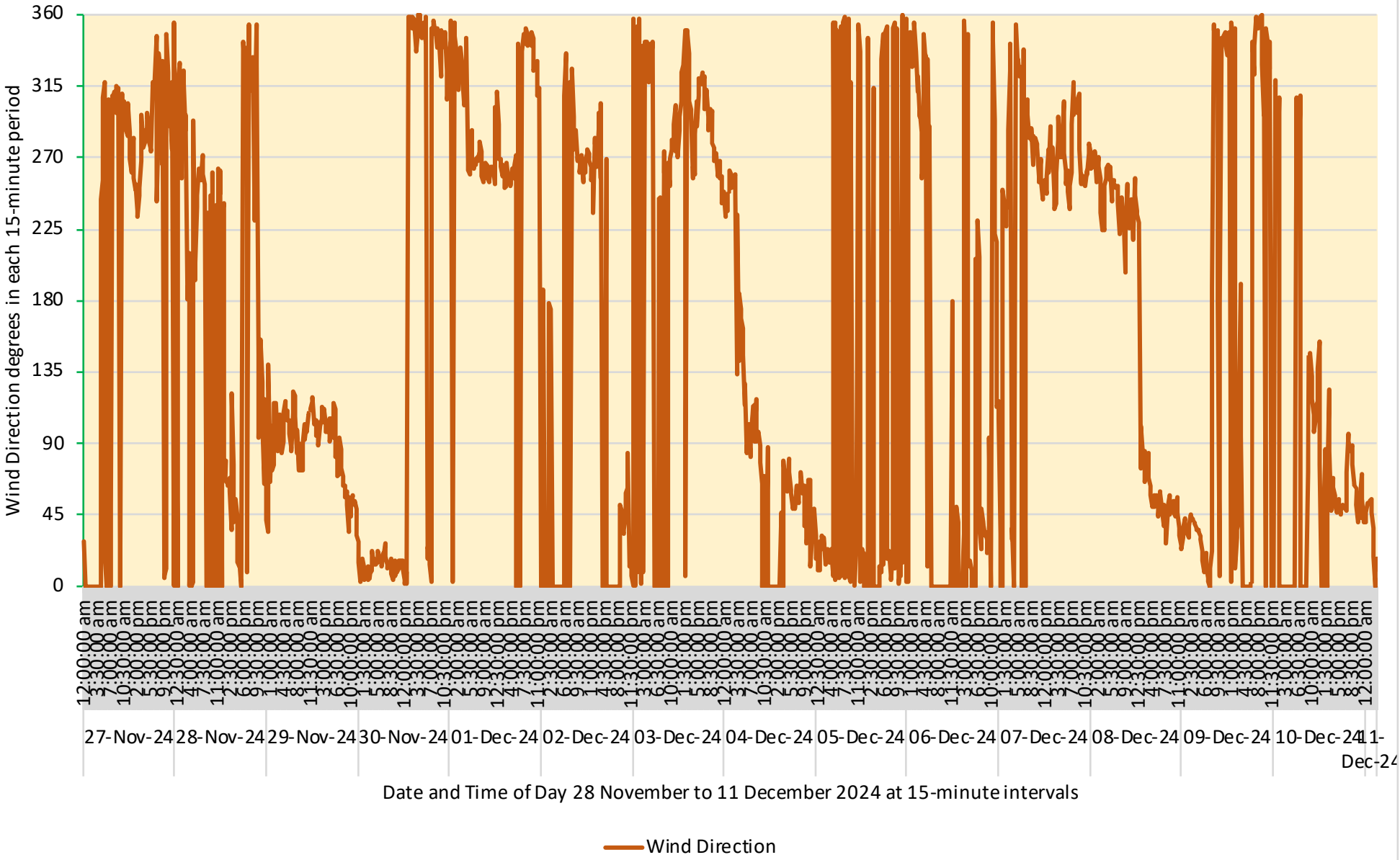


Figure 3.5: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 27/11 to 1/12/2024

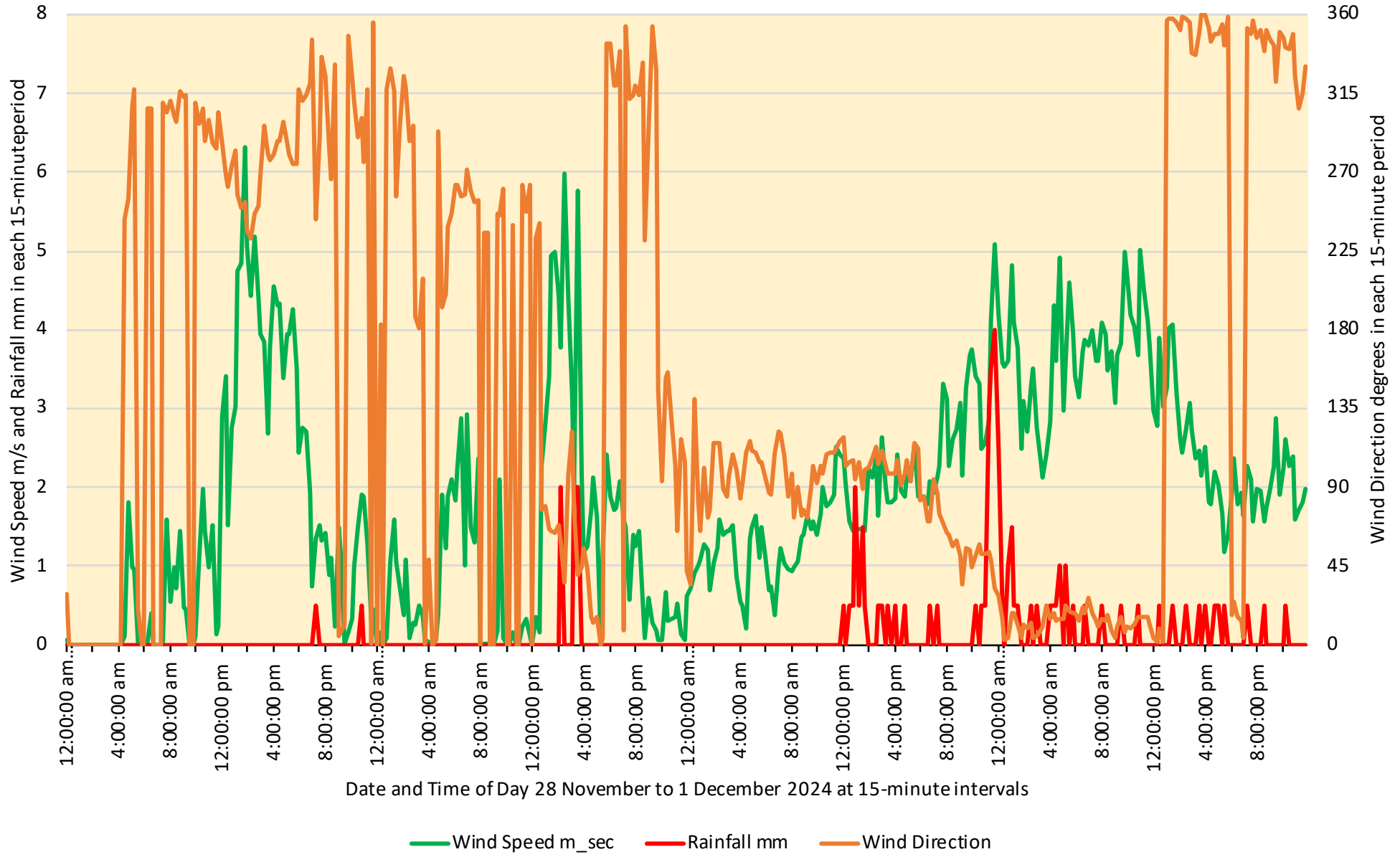


Figure 3.6: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 1 to 4/12/2024

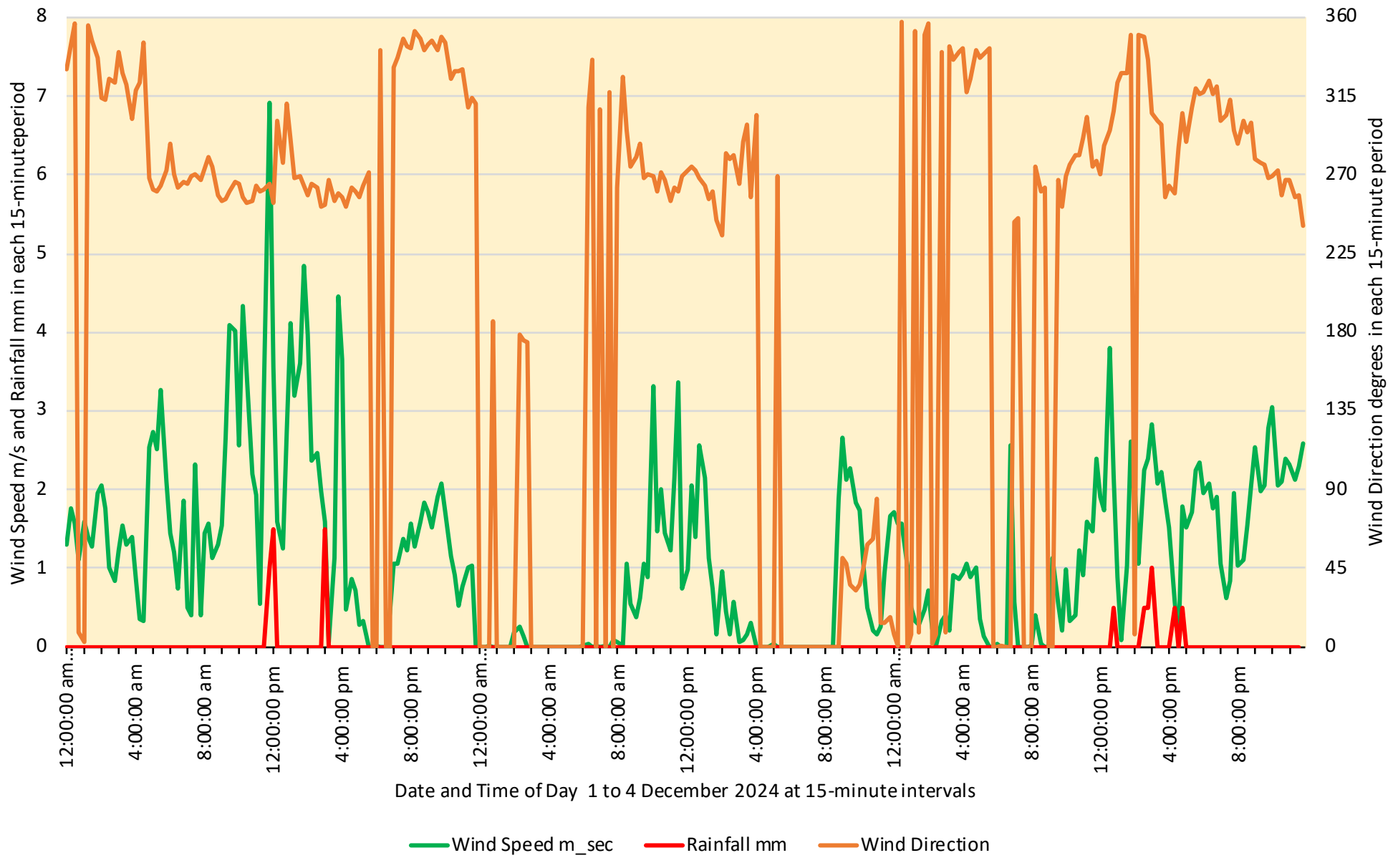


Figure 3.7: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 4 to 7/12/2024

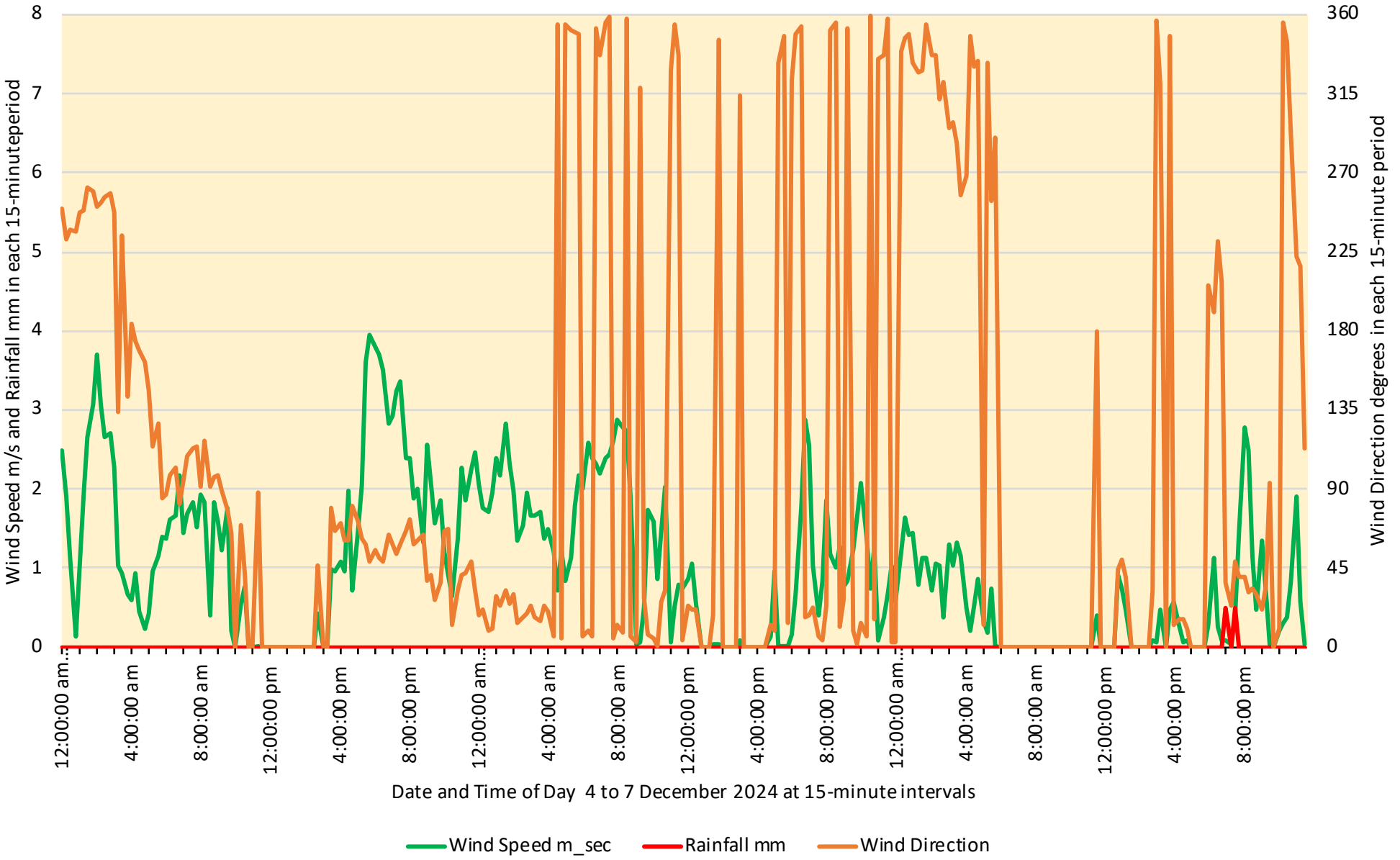


Figure 3.8: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 7 to 11/12/2024

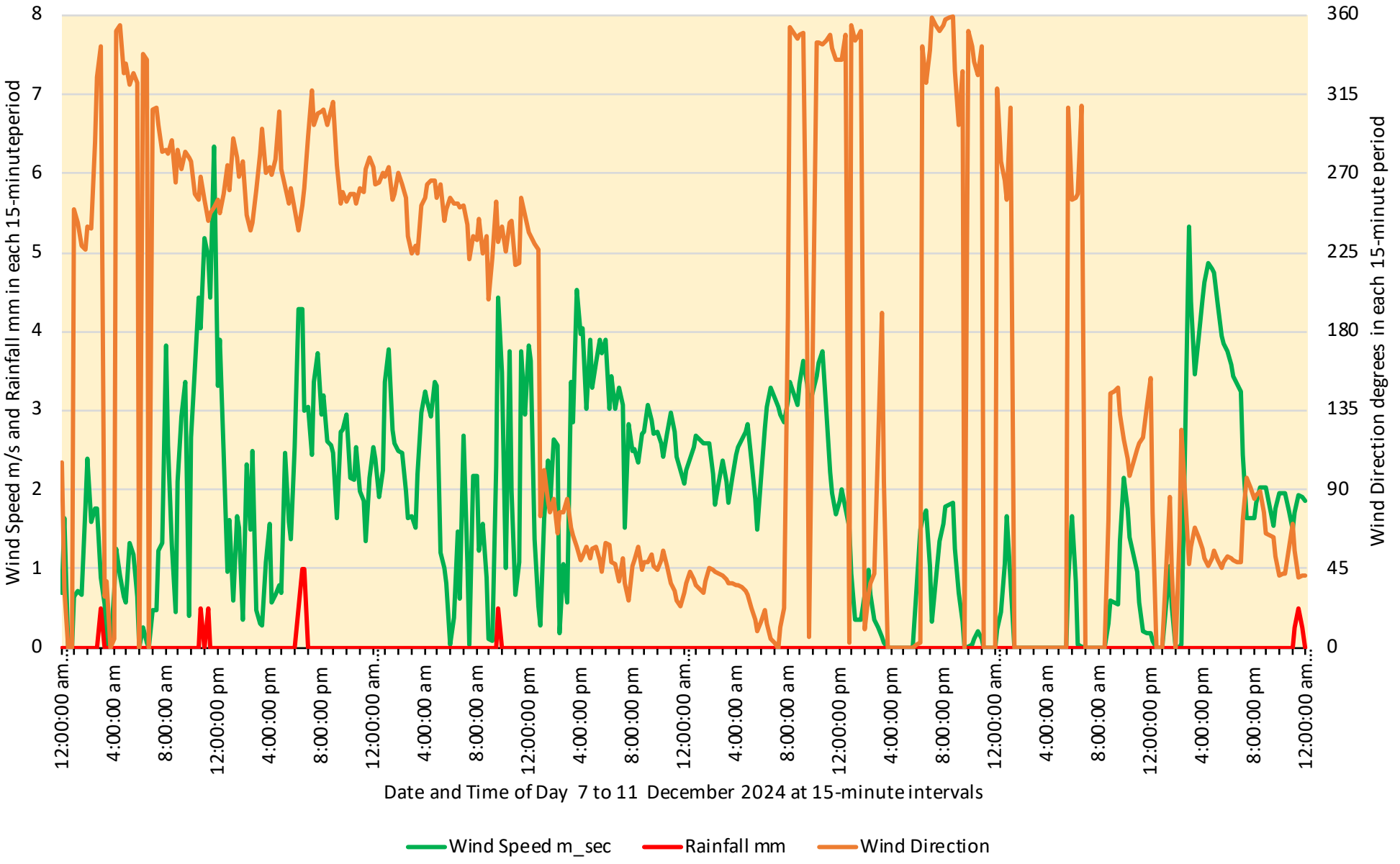


Figure 3.9: Boral Cement Berrima Annual Environmental Noise Assessment 2024 - Weather 10 to 11/12/2024

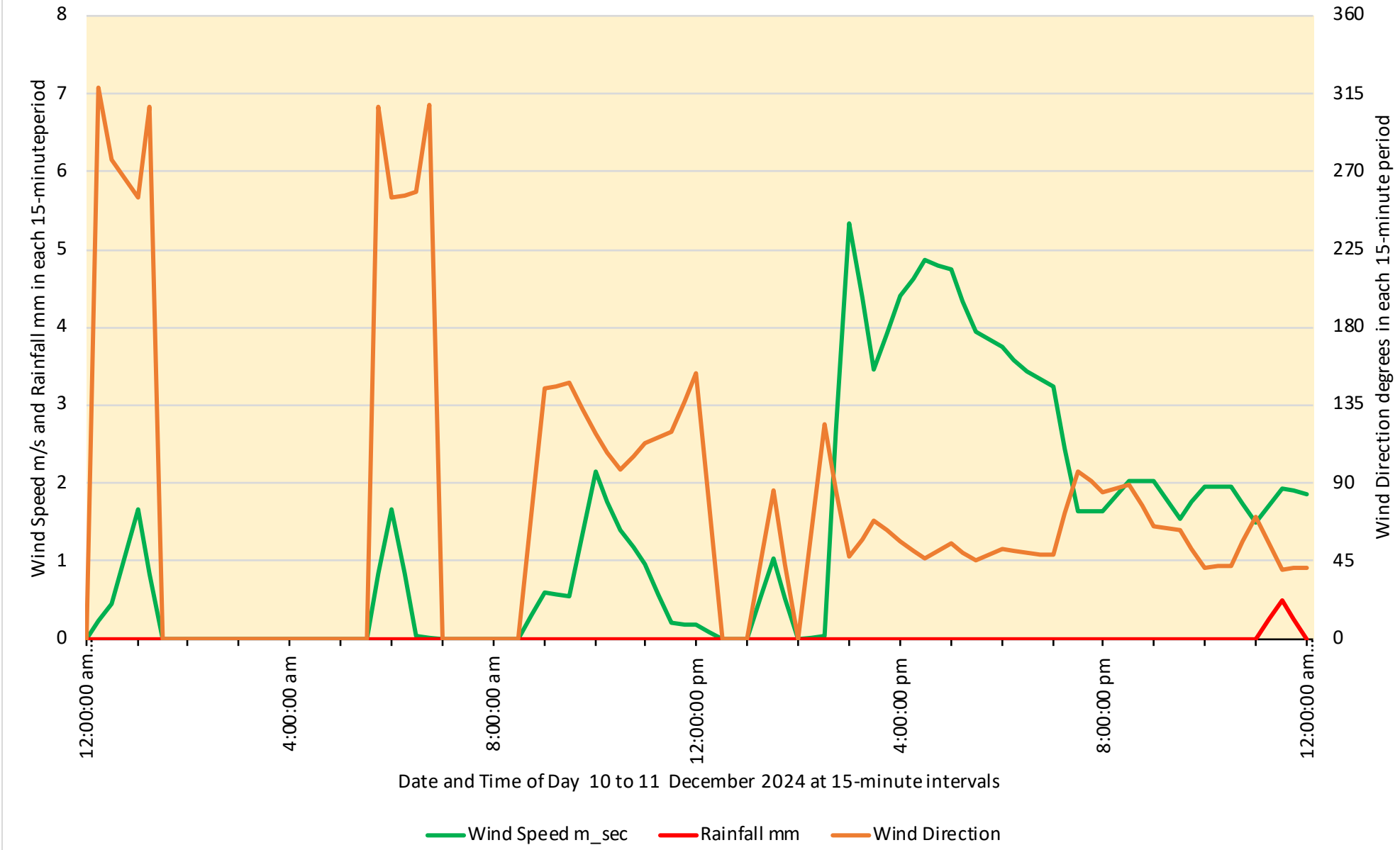


Figure 3.10: Boral Cement Berrima Annual Environmental Noise 2024 - Wind speed and direction 27/11 to 10/12/24

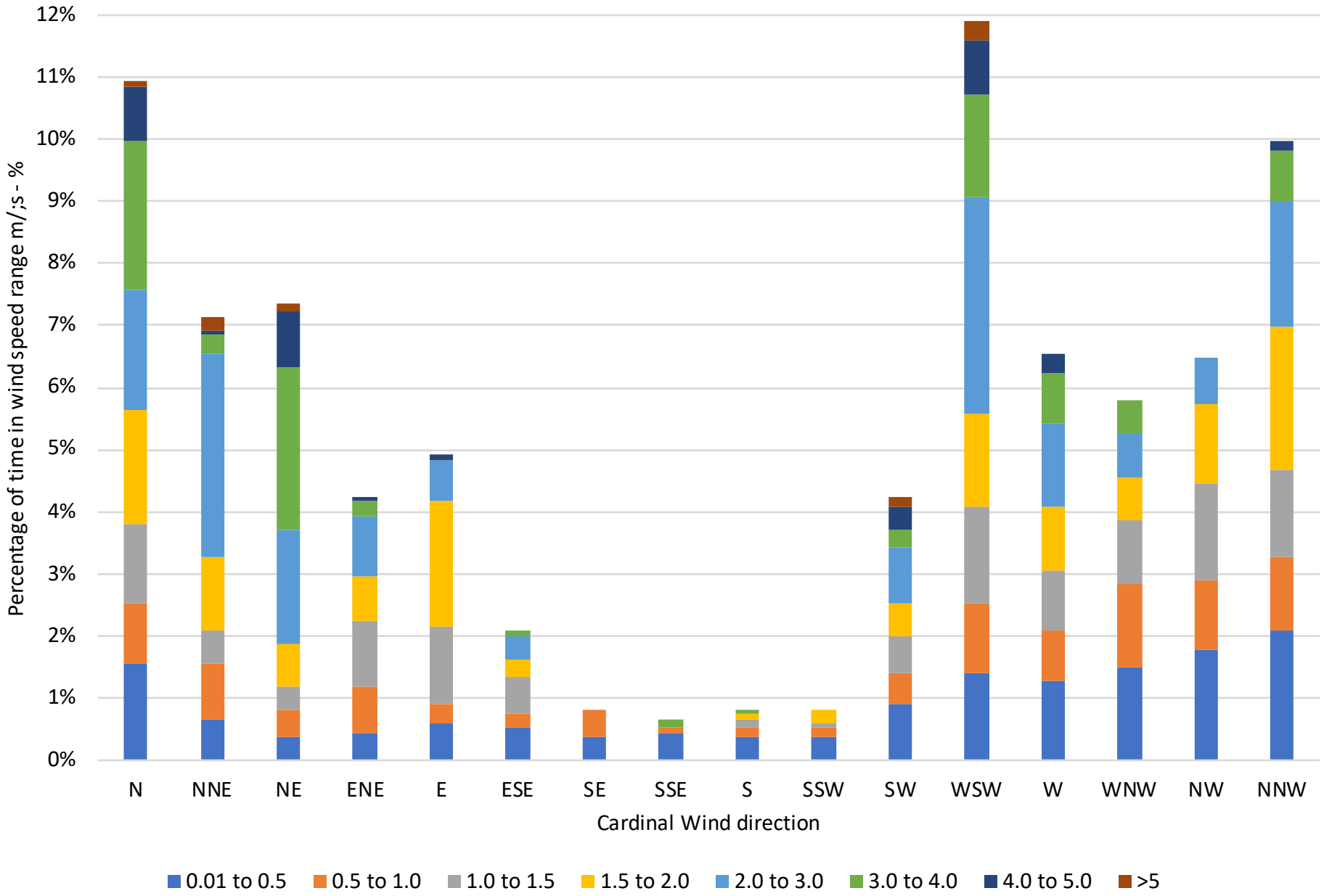


Figure 3.11: Boral Cement Berrima Annual Environmental Noise 2024 - Wind direction percentage of time 27/11 to 10/12/24

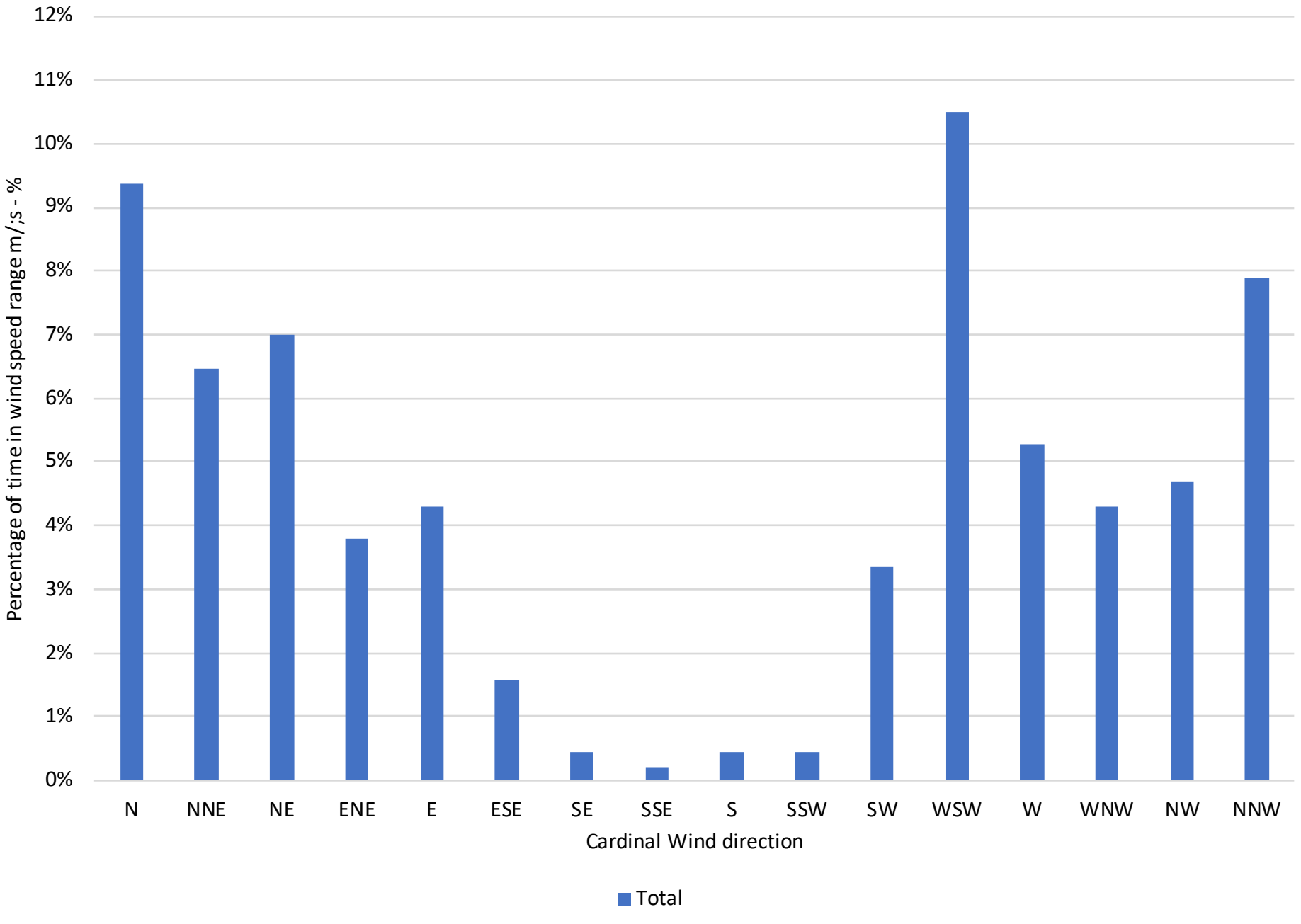


Figure 3.12: Boral Cement Berrima Annual Environmental Noise 2024 - Wind speed and direction 27/11 to 10/12/24 Wind Rose 24-hours - Calm 15.3%

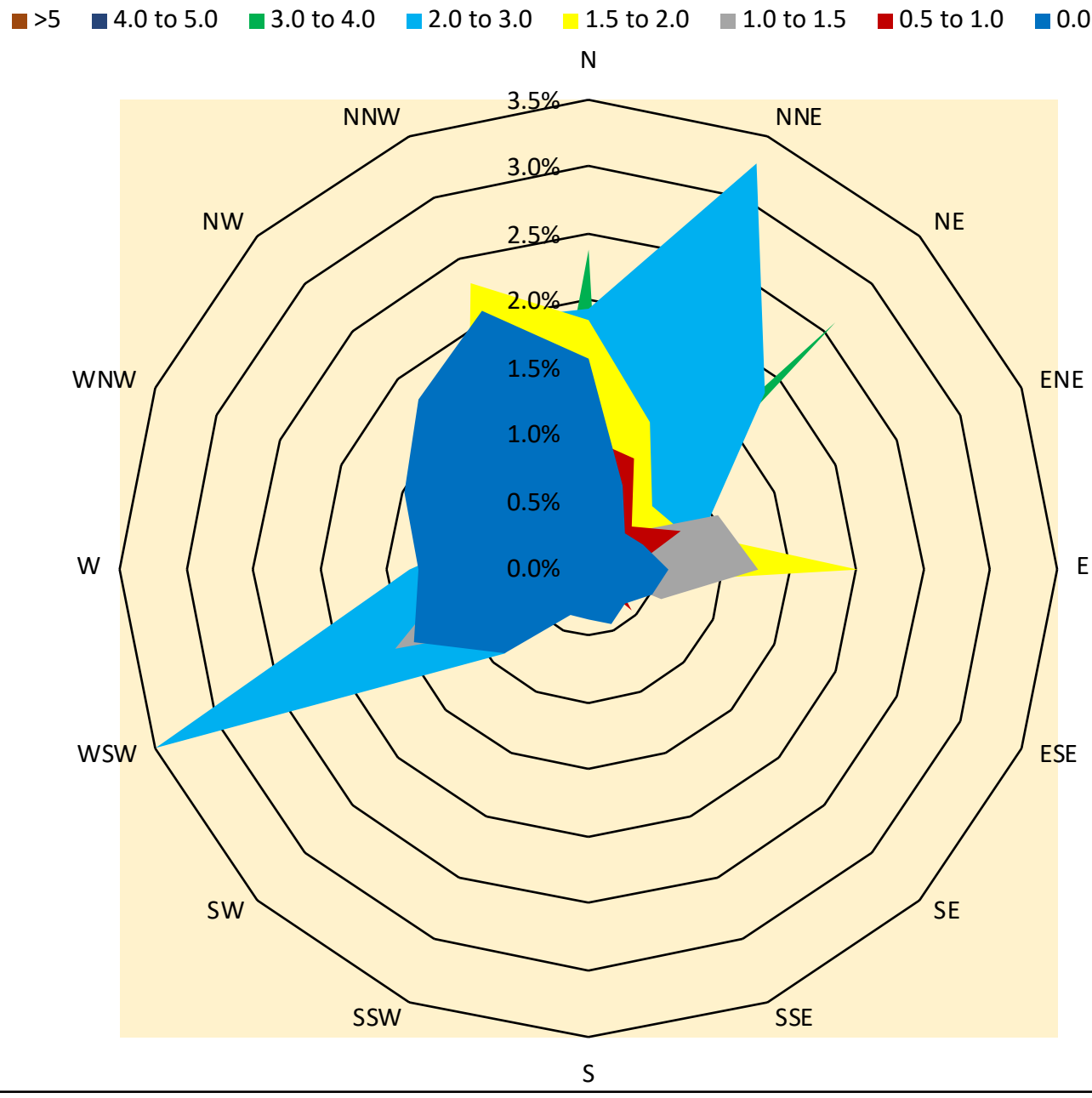


Figure 3.13: Boral Cement Berrima Annual Environmental Noise 2024 - 27/11 to 10/12/24 Wind Rose for 24-hour periods - Total Percentage of directions : Calm 15.3%

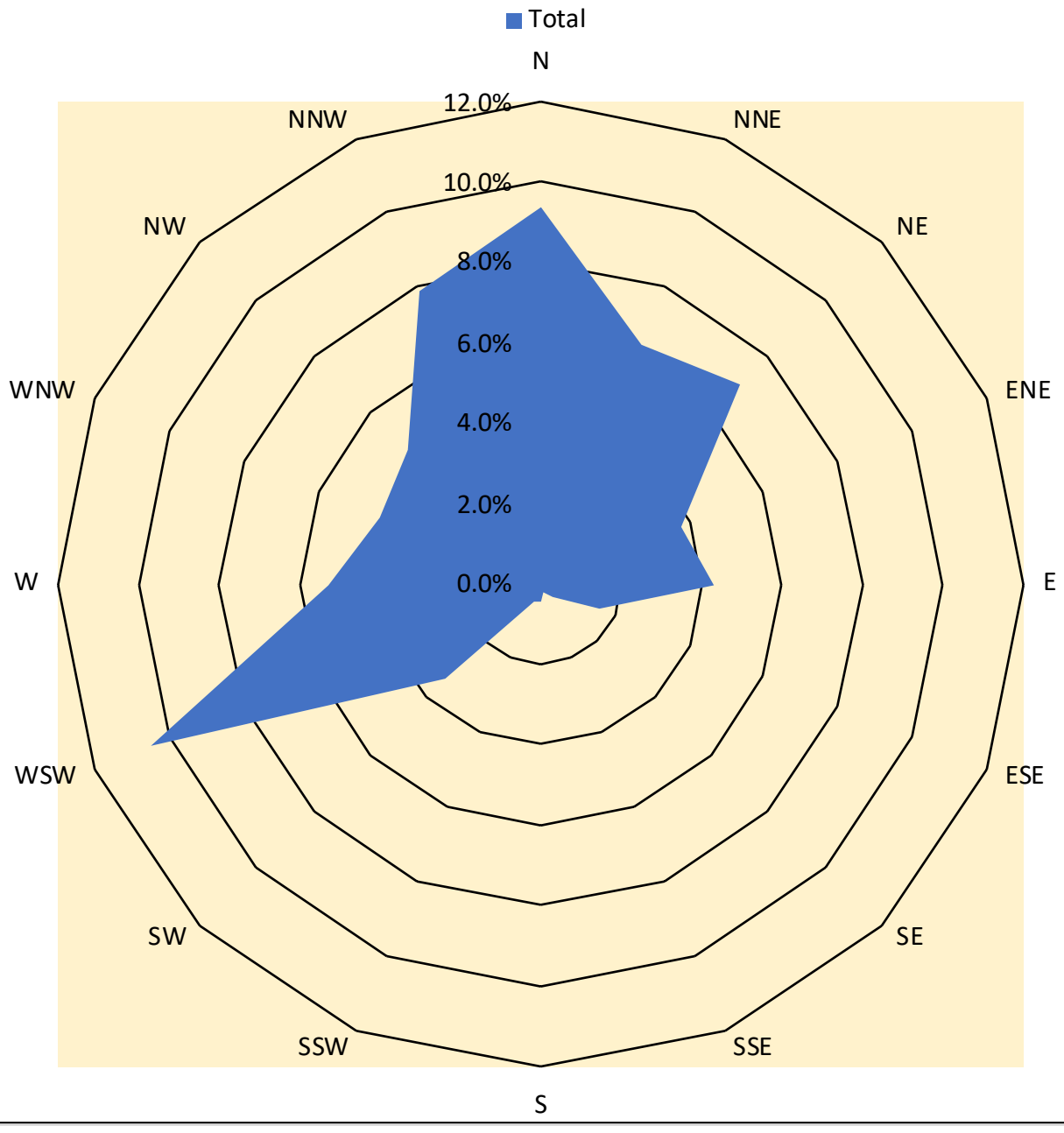


Figure 3.14: Boral Cement Berrima Annual Environmental Noise 2024 - 27/11 to 10/12/24
Wind speed and direction range for Daytime 7am to 7pm

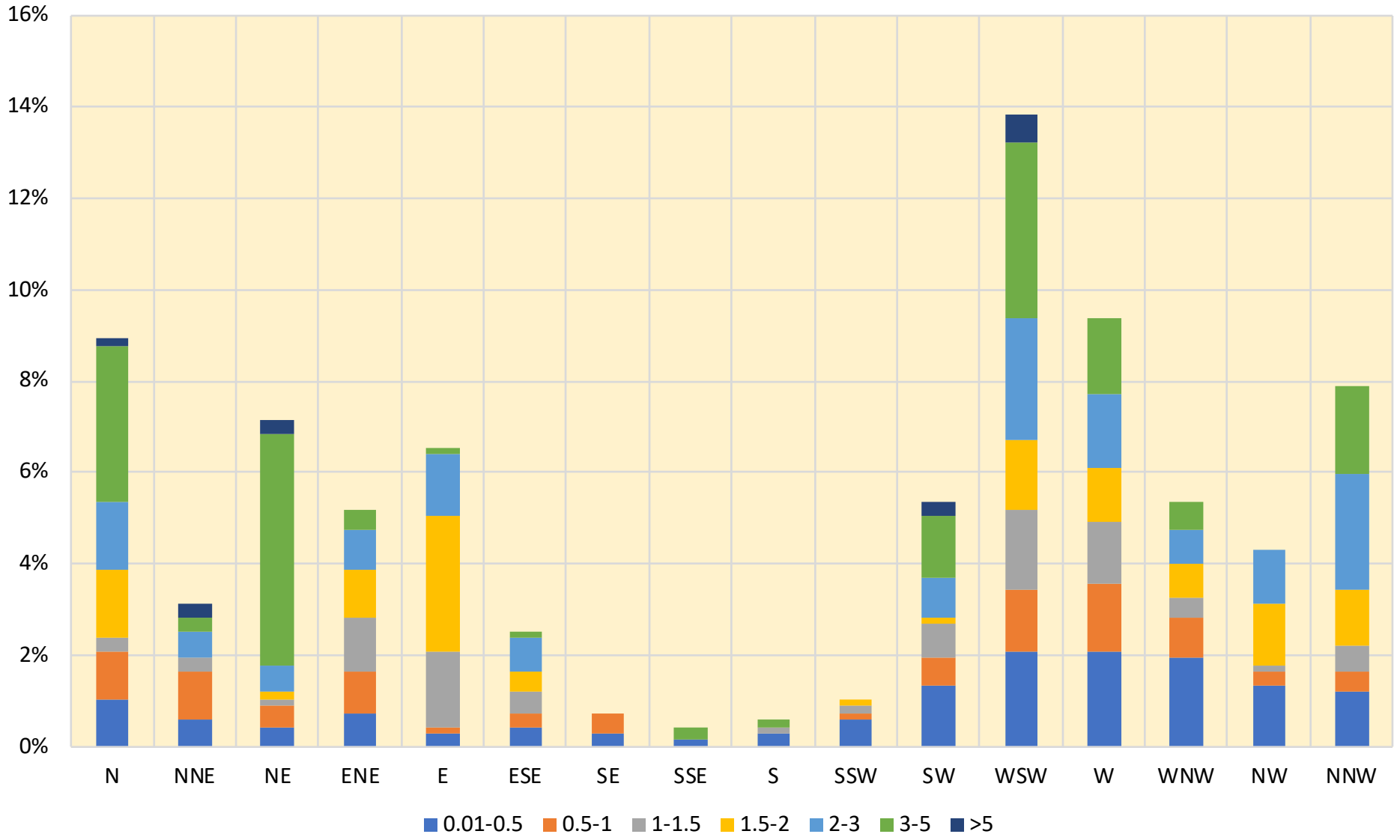


Figure 3.15: Boral Cement Berrima Annual Environmental Noise 2024 - 27/11 to 10/12/24
Daytime wind direction - Calm 17.6%

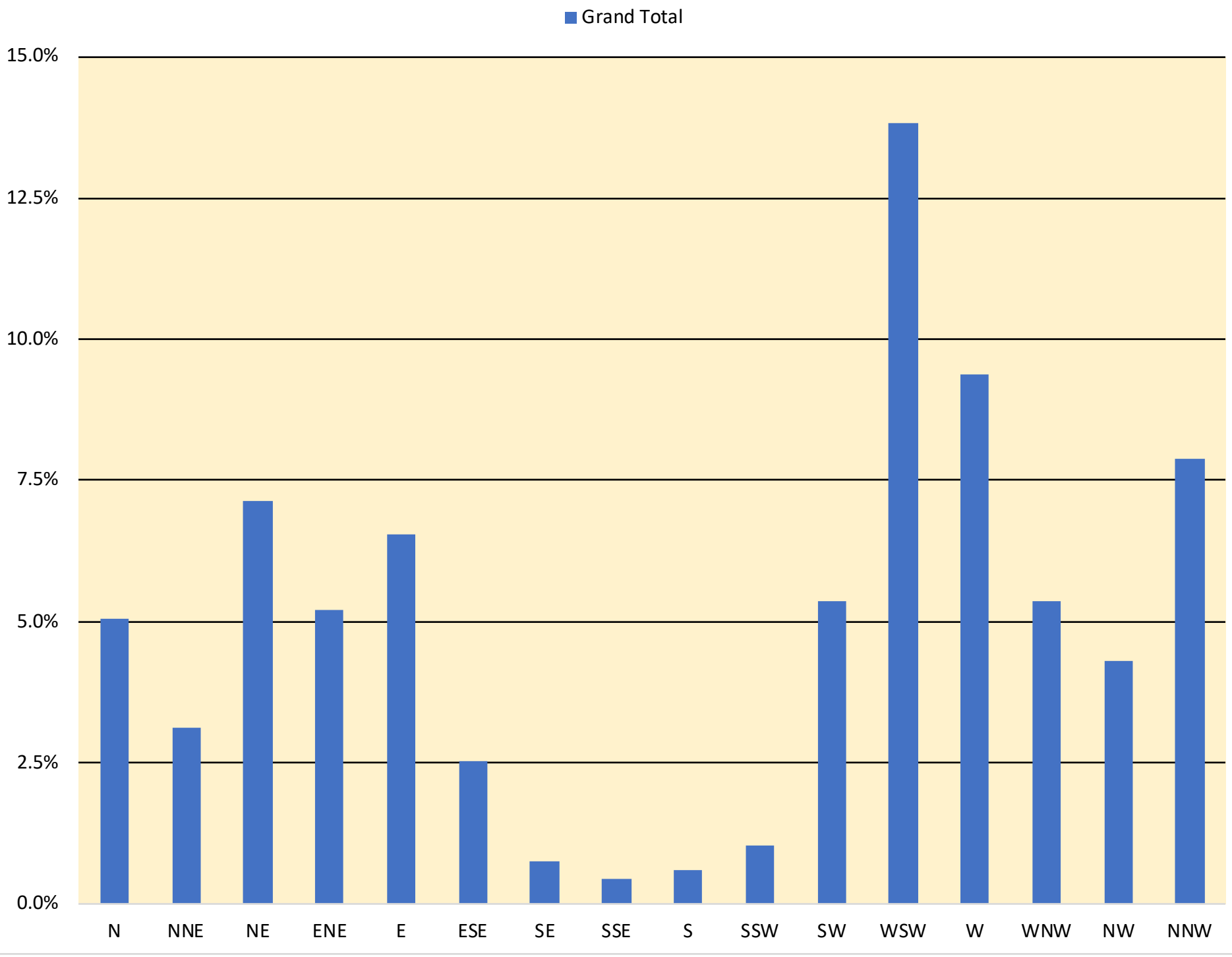


Figure 3.16: Boral Cement Berrima Annual Environmental Noise 2024 - 27/11 to 10/12/24
Daytime wind rose - Calm 17.6%

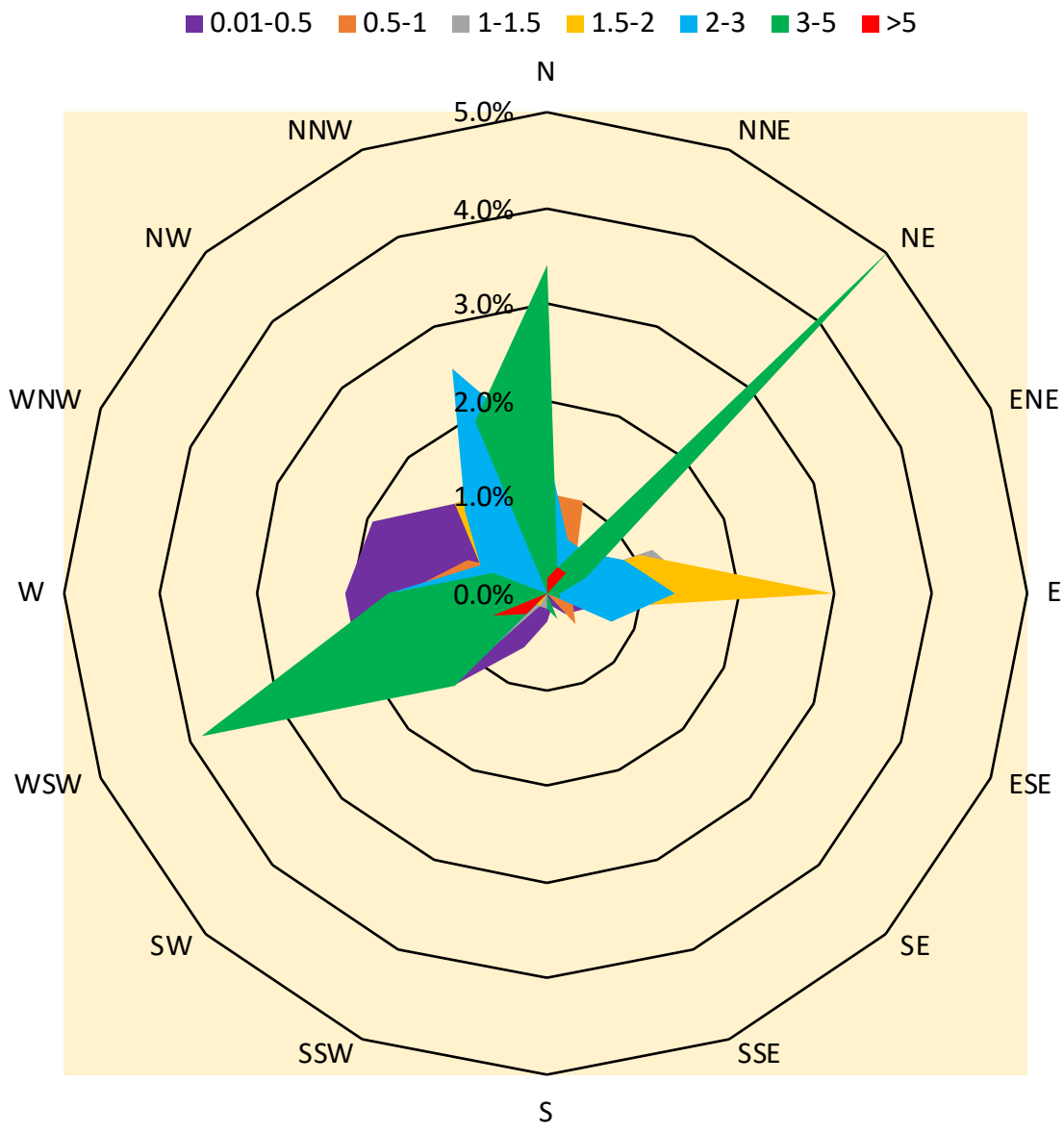


Figure 3.17: Boral Cement Berrima Annual Environmental Noise 2024 - 27/11 to 10/12/24
Daytime wind rose all speeds- Calm 17.6%

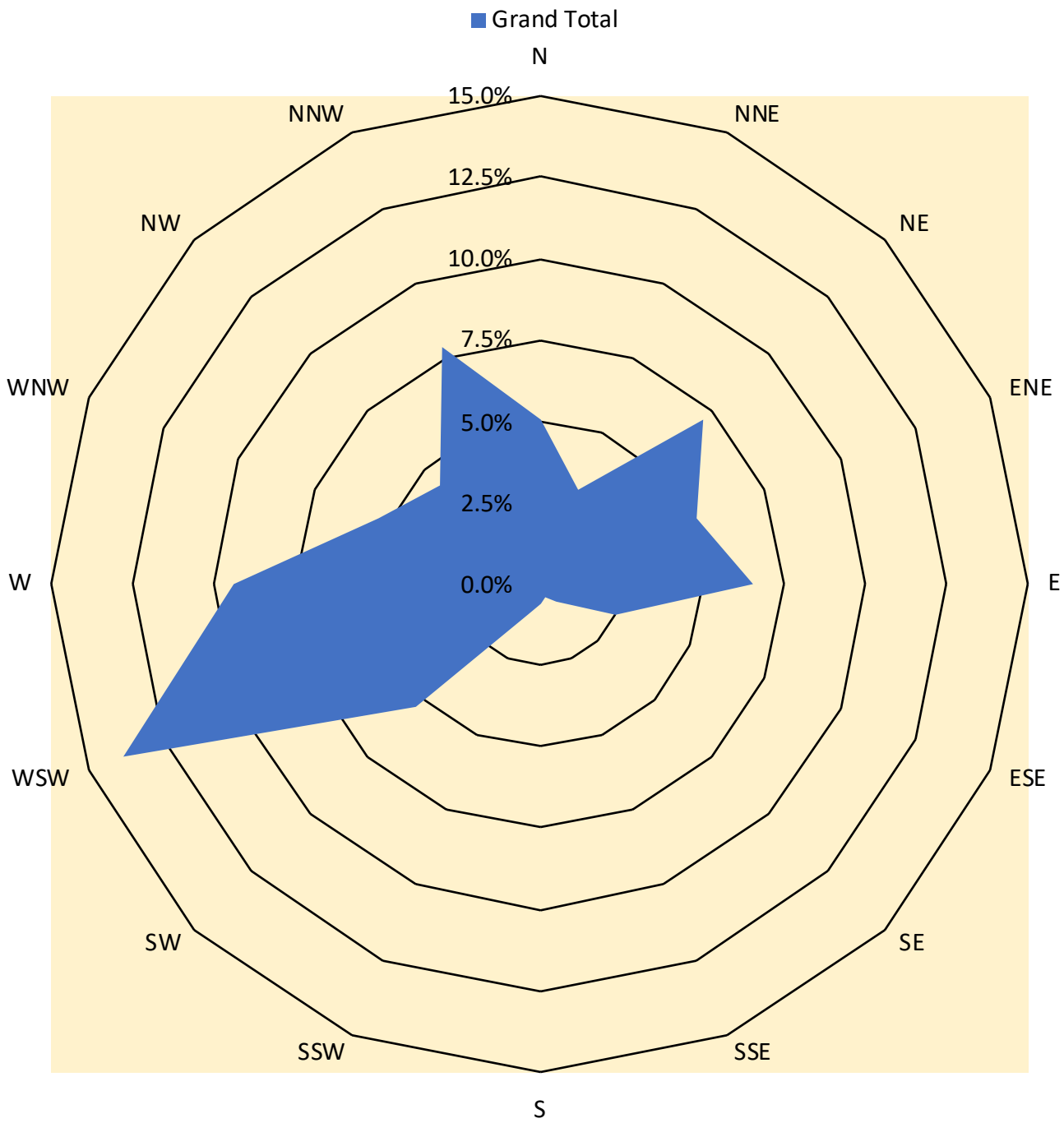


Figure 3.18: Boral Cement Berrima Annual Environmental noise 2024 -
Wind conditions 27/11 to 10/12/24 Wind speed and direction ranges Night-time - Calm 13.11%

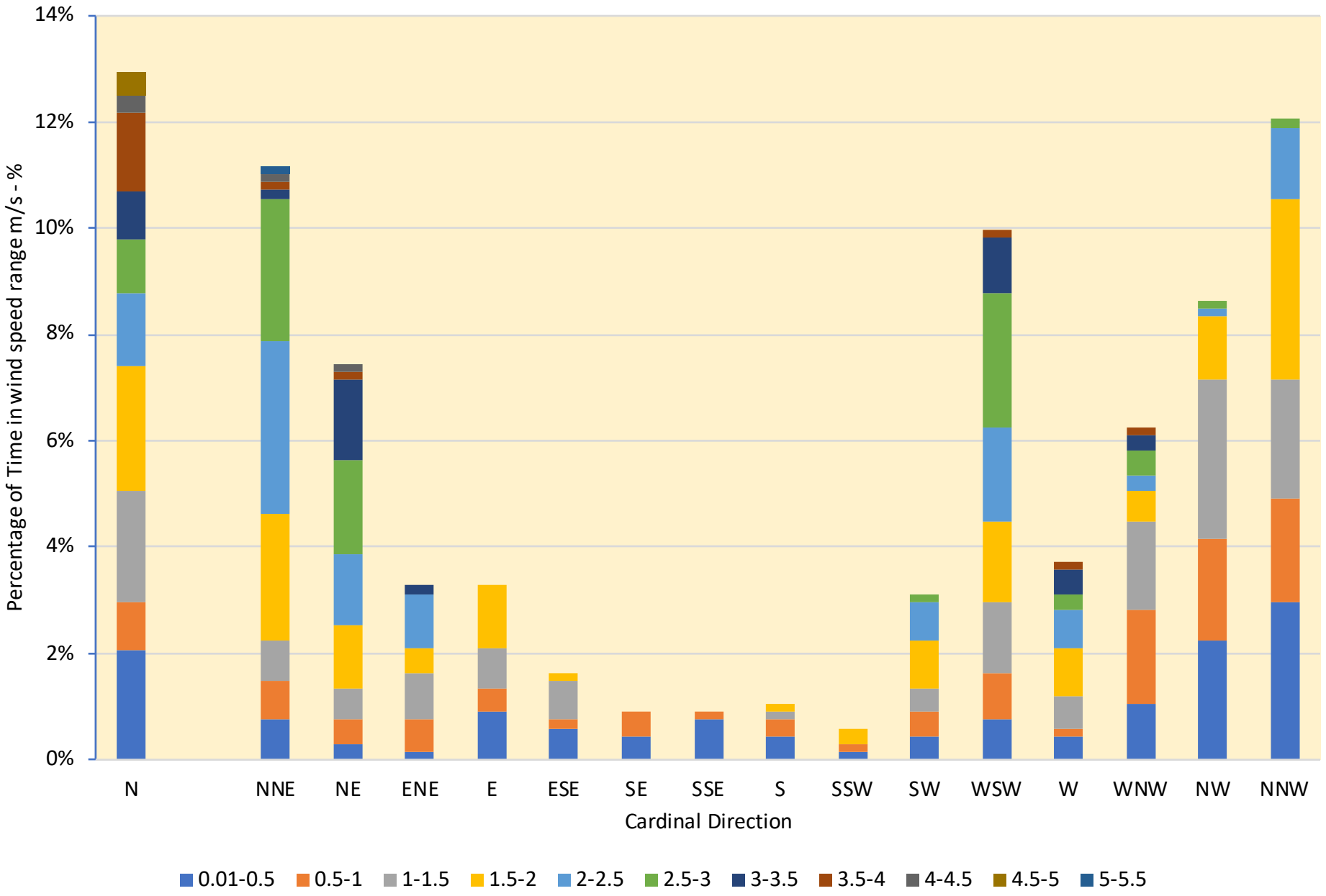


Figure 3.19: Boral Cement Berrima Annual Environmental noise 2024 -
Wind conditions 27/11 to 10/12/24 Wind direction Night-time - Calm 13.11%

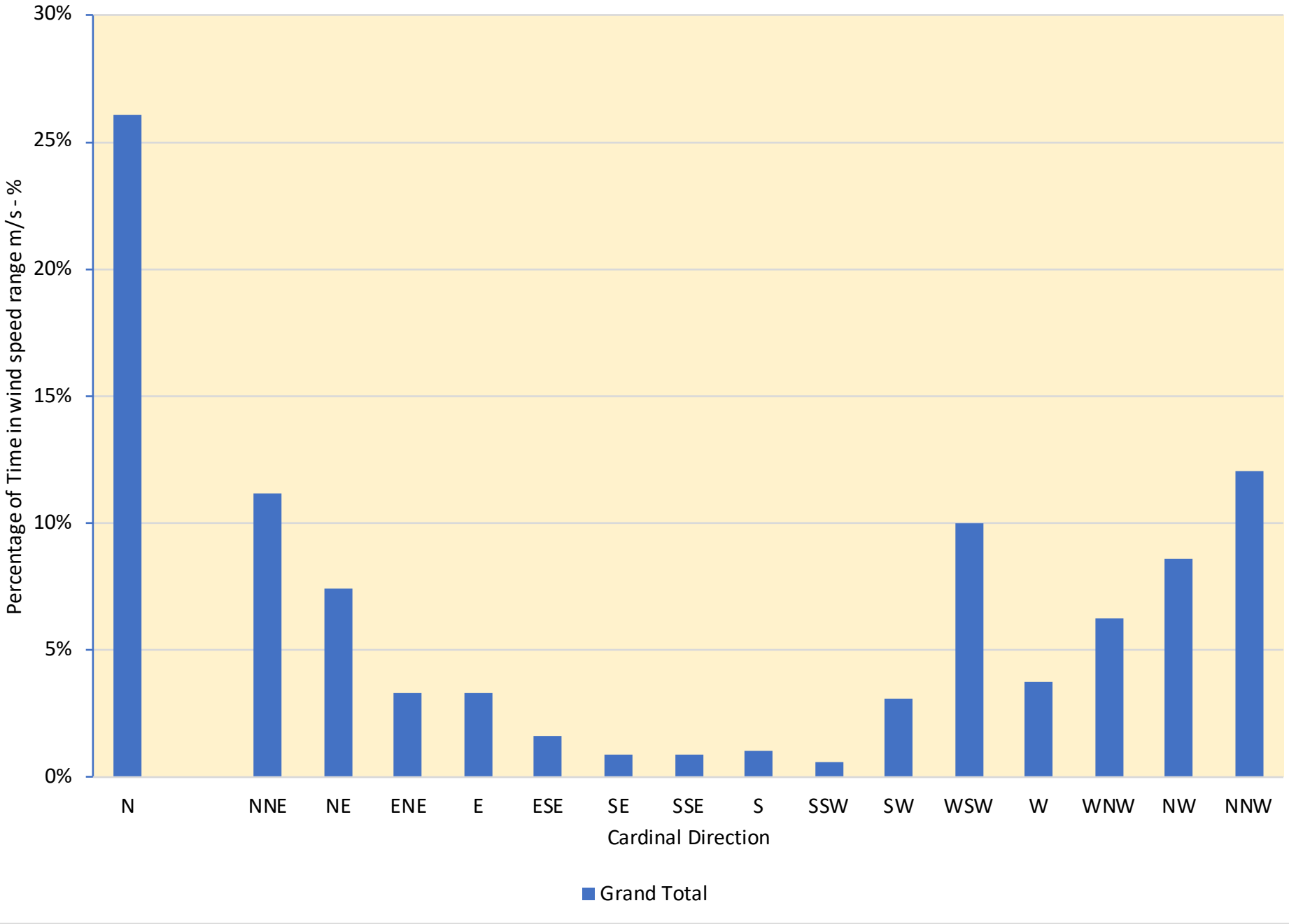


Figure 3.20: Boral Cement Berrima Annual Environmental noise 2024 - Wind conditions 27/11 to 10/12/24 Wind direction and speed range Night time wind rose - Calm 13.1%

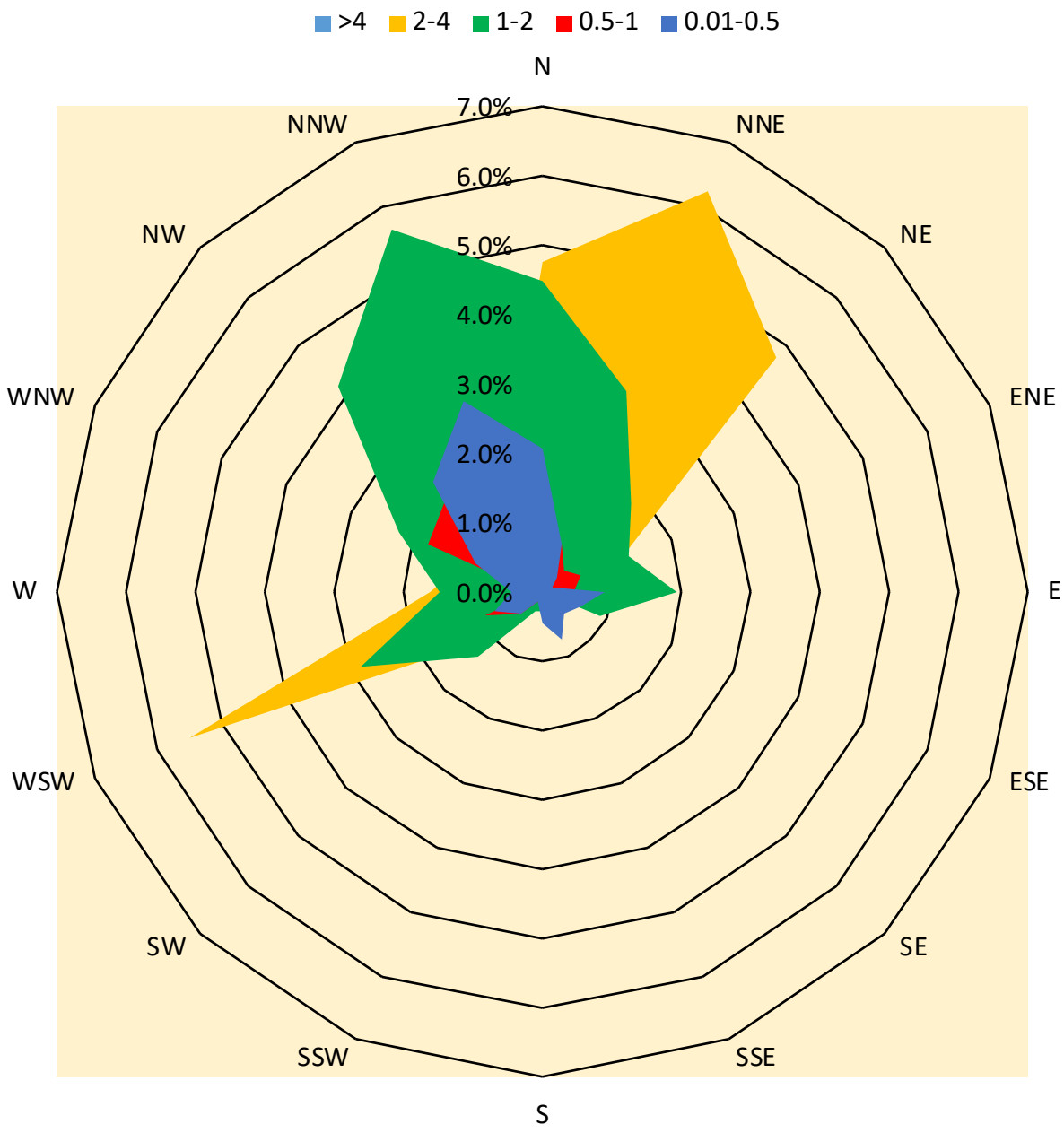
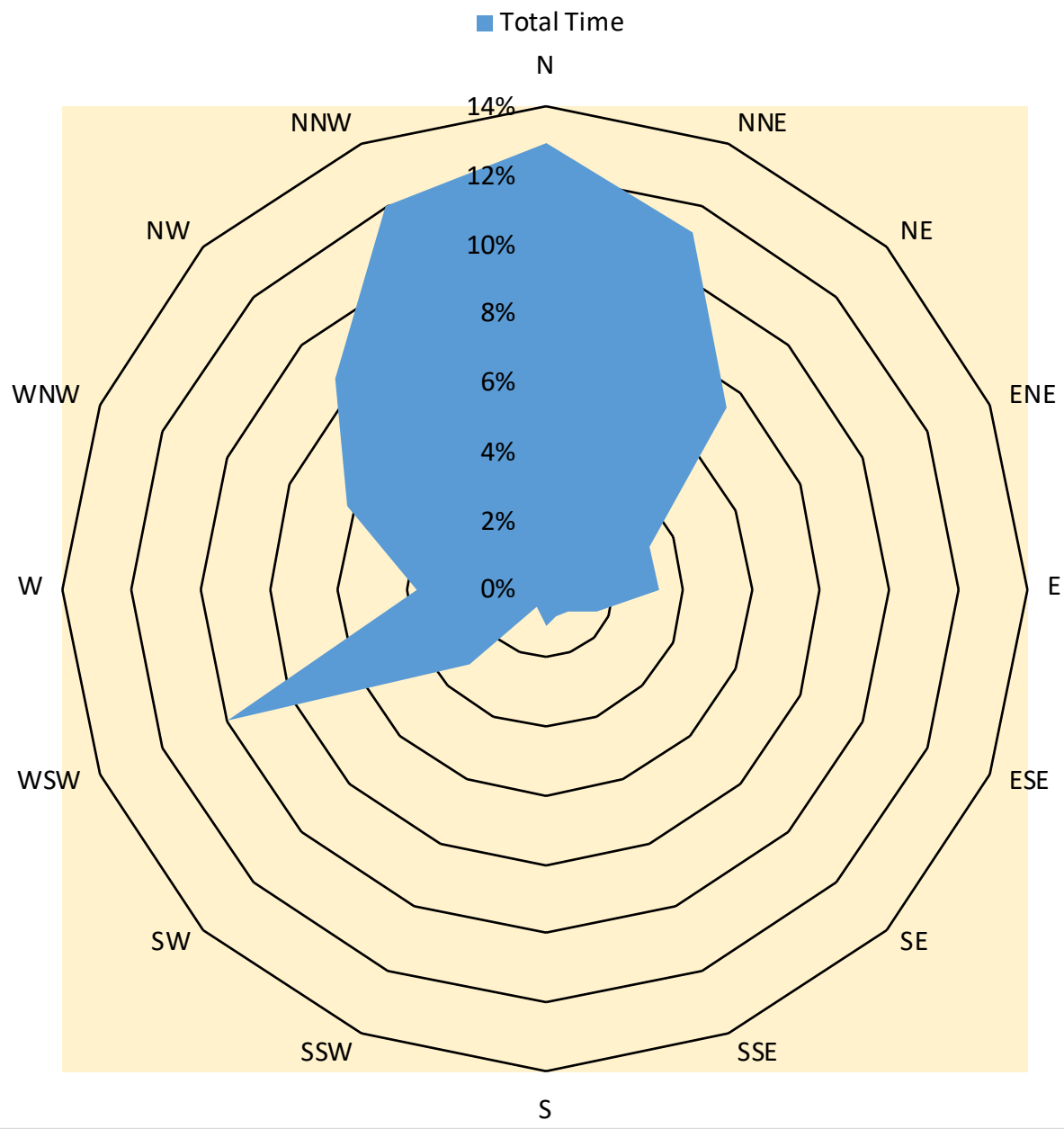


Figure 3.21: Boral Cement Berrima Annual Environmental noise 2024 - Wind conditions 27/11 to 10/12/24 Wind direction Night time wind rose - Calm 13.1%



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4 Results of Sound Level measurements

4.1 Long-term unattended monitoring results

Table 4.1 provides a summary of the statistical data for all monitored sites over the full period of the monitoring. Results for 4 Melbourne St, the Northern Fence and Location 20 are based on the long-term average sound levels over two weeks.

The results show that for average period (daytime, evening and night-time) L_{Aeq} values, Location 20 averaged 55 to 57 dBA with evening being the lowest sound level period. $L_{A90,period}$ average was 53 dBA for daytime, evening and night-time. This is below the long-term objective of 56 dBA. The two-day graphs of $L_{Aeq,15\text{-}min}$ and $L_{A90,15\text{-}min}$ are shown in Appendix D. These results are discussed in more detail in the next section. The lowest period of sound levels at location 20 was on the morning of 28 December between 4:45am and 5:45am when the $L_{Aeq,15\text{-}min}$ was as low as 52 dBA and the $L_{A90,15\text{-}min}$ was 47 to 49 dBA. The maximum $L_{A90,15\text{-}min}$ was 57 dBA at 12:30am on 30 November – the $L_{Aeq,15\text{-}min}$ in that period was 58 dBA, possibly related to rain or wind. The This was also the highest sound level period at 4 Melbourne St, as described below. This maximum $L_{A90,15\text{-}min}$ of 57 dBA is below the compliance limit for the site of 58 dBA.

4 Melbourne Street unattended monitoring provides residential receiver long-term sound levels. The long-term average $L_{Aeq,period}$ sound levels were 53 dBA daytime, 49 dBA evening and 48 dBA night-time. These are slightly lower than in 2023 and lower than the long-term average since 2002. Average $L_{A90,period}$ sound levels were 42 dBA daytime and 41 dBA evening and night-time. These are lower than in 2023 and lower than the long-term average since 2002. The results of the two-day graphs of $L_{Aeq,15\text{-}min}$ and $L_{A90,15\text{-}min}$ are shown in Appendix B. Night-time $L_{A90,15\text{-}min}$ sound levels ranged from 35 to 56 dBA, with one night being in the range 35 to 40 dBA and others higher. The difference between $L_{Aeq,15\text{-}min}$ and $L_{A90,15\text{-}min}$ values was lowest in the night-time at 3 dB on some occasions, and highest in daytime with up to 15 or 16 dB difference most of the time, apart from event periods. The highest period of night-time $L_{A90,15\text{-}min}$ sound levels was up to 56 dBA $L_{A90,15\text{-}min}$ at 12:30 am after midnight on 30 November, may have been related to a period of rainfall and wind.

The major influence on night-time sound levels appeared to be wind speed, as noted in assessments for previous years. Wind direction had some influence on some occasions with northerly wind directions having lower sound levels sometimes and south-easterly winds having higher sound levels in some periods, but this was not always the case. Non-operation of major plant items did not appear to have a significant effect on sound levels, apart from when they were all off on one occasion from 8:30am to 9:30am on 6 December and the $L_{A90,15\text{-}min}$ was 5 to 7dB lower than before or after.

Northern Boundary unattended measurement results are shown in Appendix C. Long-term average sound levels for $L_{Aeq,period}$ were 51 dBA daytime for all periods (day, evening and night). $L_{A90,period}$ average sound levels were 47 dBA for all periods (day, evening and night). While the differences between the averages are low, there are times when the 15-minute $L_{Aeq,15\text{-}min}$ sound levels vary by 10 to 12 dB between measurements, either from local vehicle activities in the stores area nearby or from bird activity.

In each location, sound levels increased on most mornings from approximately 4:30am with the increase in bird and local traffic activity.

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Table 4.2 compares the long-term average results for 2024 with those measured since 2002. Table 4.2A shows the results from 2015 to 2024. Measurements from locations at 12 Brisbane St and Adelaide St near the corner with Taylor Avenue are also included, the results since 2020 being from attended monitoring only. Overall there have been no significant changes or increases in long-term average sound levels.

A measurement of sound levels over periods of 1 to 3 minutes has also been made on the roof of the Administration Building/Control Room during each annual survey since 2016. This is to provide a comparison and identify any changes in level and spectra over time. The results for the south-east corner location are also shown in Table 4.2 and Table 4.2A. The results show only 2 dB variation over that time.

Figures 4.1 to 4.3 show graphs of the long-term average results as a type of time history comparison for each unattended monitoring site. Figures 4.3A and 4.3B show the comparisons for daytime attended monitoring at 12 Brisbane St and Adelaide St locations. Figure 4.4 shows the results for the Administration Building roof location. These graphs also indicate there have been no significant increases in long-term sound levels from 2018 to 2022 or since measurements commenced in 2002.

The absence of significant increases in long-term average sound levels for logger monitored locations indicates that the noise emissions from the total plant are achieving compliance with the objectives.

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4.2 Location 20 Store Yard (Close) location results compared to licence conditions and recommendations

4.2.1 $L_{A90,period}$ sound levels

The licence condition for noise emissions from the site is consolidated into measurements at Location 20, with $L_{A90,15\text{-minutes}}$ not to exceed 58 dBA. The PRP recommended objectives for the Store Yard Close location were a long-term average $L_{A90.period}$ not greater than 56 dBA or 58 dBA for any 15-minute period. Measurement methods have to be generally as required in the NSW Noise Policy for Industry – this means omission of results during high wind speed or rainfall or from extraneous sources. Results of the measurements are provided in Appendix D.

For the 15 days of measurements, the highest 15-minute period value for $L_{A90,15\text{-min}}$ was 57 dBA, which is similar to or lower than the highest 15-minute sound levels in previous years. This occurred in the single 15-minute period starting at 12:30am on the night/morning of 30 November. During this period there was rainfall on either side of the period and reasonably high wind speeds occurring from 3.5 to 4 m/s from the north.

Table 4.3 shows the number of $L_{A90,15\text{-minute}}$ sound levels at specific values between 42 and 59 dBA and these are also shown graphically in Figures 4.5 to 4.8. The specific 15-minute noise objective was not exceeded for 100% of the measurements. **This means that the site was in compliance with its general licence condition.**

Of the 15-minute measurements, 87% were in the range 51 to 55 dBA, with 52 dBA having the maximum number of occurrences at 13%. 99.5% of sound levels were below 56 dBA.

4.2.2 $L_{A01.1\text{-minute}}$ and $L_{A01.1\text{-minute}} - L_{A90.15\text{-minute}}$ results for the Northern Boundary

Sound levels measured at the Northern Boundary locations included $L_{A01,1\text{-minute}}$ to allow calculations of $L_{A01,1\text{-minute}} - L_{A90,15\text{-minute}}$ at night-time to be made to provide comparisons with recommended maximum values for night-time from the Noise Policy for Industry. The recommended maximum objective of 60 dBA for $L_{A01.1\text{-minute}}$ night-time for the Northern Boundary location and not greater than 15 dB difference for $L_{A01.1\text{-minute}} - L_{A90.15\text{-minute}}$ are to indicate sleep disturbance potential and were provided as recommendations in the PRP report. The analysis is made at the Northern Boundary rather than 4 Melbourne St because sound levels at 4 Melbourne St are regularly affected by noise of passing vehicles in Taylor Avenue and would require significant analysis. It is assumed that if the North Fence results indicate acceptable conditions from Cement plant emissions, then it follows that the 4 Melbourne St location would also be acceptable for Cement Plant contribution sound levels.

The analyses made for the Northern Boundary location showed that for this location in the 2024 monitoring survey from 27 November to 11 December, there were 369 1-minute night-time periods which exceeded the objective of $L_{A01,1\text{-minute}} - L_{A90,15\text{-minute}}$ not to exceed 15 dB. This is significantly more than the 55 observed in 2023 assessment but less than the 871 observed in the 2022 assessment. From the analysis for 2024, there were five (1%) of these 369 measurements observed before 3:00am and they were related to train events and fireworks. From the rest of the 364 events, 7% (26) were measured from 3am to 4am, 29% (107) were measured from 4am to 5am, 33% (123) were measured from 5am to 6am and 29% (108) were measured from 6am to 7am. On multiple occasions, in one-minute detection of exceedance, there was more than one noise source identified; for example birds and trucks.

In reviewing these events, and due to the total number in the sample set, 102 of the 369 were listened to and each of the 15-minute periods in which the events occurred would be represented. Table 4.4 shows the results of the analysis performed. It should be noted that within an event, there may have been more than one noise source and it is only the prominent noise source that caused the exceedance which was noted. The summary and distribution with respect to hour of the day of the $L_{A01,1\text{-minute}} - L_{A90,15\text{-minute}}$ parameter can be observed below in Table 4.4A.

Table 4.4A Distribution and Summary of maximum $L_{A01.1min} - L_{A90.15\text{-min}}$ periods measured at the North Fence greater than 15dB parameter with time of day

Time Period (Hour of the Day)	Maximum $L_{A01,1min} - L_{A90,15\text{-min}}$ > 15 dBA	Number of Occurrences
3:00	27	26
4:00	30	107
5:00	26	123
6:00	26	108
22:00	28	4
23:00	15	1

The maximum difference measured was 30 dBA in the period between 4:00am and 5:00am which was due to birds. The next highest in the same period was 29 dBA which was caused by the same bird. The five occurrences before midnight was caused by fireworks and rail movement activities (train horn and rail squeal). Most of the samples that was listened to in the 3am to 7am period observed birds in some form. It is estimated that 95% of the sample had birds as the prominent source, 11% were trucks and 9% were trucks running over a bump in Taylor Ave. 6% of the events observed were impact noise from the Cement Works.

As noted above, the comparison of the event sound levels received at the Northern Boundary indicated that the highest levels of $L_{A01,1\text{-minute}}$ measured were caused by birds, the highest being 80 dBA. Trucks on Taylor Ave were also identified at the Northern Boundary location. Rail squeal and a train horn were noted to have $L_{A01,1\text{-minute}}$ sound levels at times of greater than 60 dBA at the Northern boundary; however, the number of occurrences was the same as in the corresponding survey reported in the 2023 Annual Noise Assessment report (2 events) and less than the 2022 Annual Noise Assessment report (5 events).

The number of exceedances was higher than in the 2023 survey (due to the number of birds events and the season in which the survey occurred being warmer), and lower than in the 2022 survey. However, the number of events identified as being from Cement Works emissions for 2024 is very similar to those of the corresponding analysis from the 2023, 2022 and 2021 Annual Noise Assessment reports. These analyses indicate that the number or times that the objectives of $L_{A01,1\text{-minute}}$ greater than 60 dBA and $L_{A01.1\text{-minute}} - L_{A90.15\text{-minute}}$ difference results are greater than 15 dB and are caused by Cement Plant events, are relatively low compared to the other sources causing the events.

On the basis of this analysis, it is considered that the noise emissions from the Cement Plant have a low potential for sleep disturbance. Site measurements and analyses indicate that the most likely cause of site sources to exceed criteria is rail associated noise, but not all rail events cause exceedances.

4.2.3 Low frequency noise

The NSW Noise Policy for Industry has a section for assessment of low frequency noise from industry as received at residential locations. This is based on an initial screening test of the C-weighted minus A-weighted $L_{eq,15\text{-min}}$ (L_{Ceq}-L_{Aeq}) period sound level difference exceeding more than 15 dB. If the screening value is exceeded, a one-third octave band frequency analyses is then made of un-weighted (or Z-weighted L_Z) sound levels in the low-frequency bands from 10 Hz to 160 Hz, and compared to a specific criterion or threshold value. The results obtained for these calculations from the community attended monitoring locations in 2024 are shown in Table 4.5

If the threshold levels are exceeded by up to and including 5 dB in evening or night-time, a positive adjustment of 2 dB is added to the measured sound level for comparison with an objective. If the exceedance in any band is more than 5 dB, a positive adjustment of 2 dB is added to the measured sound level for daytime and 5 dB added for evening and night-time.

The initial screening test on attended measurements indicated that exceedances were reported on five occasions measured at 4 Melbourne Street, and one occasion for 12 Brisbane St (from the daytime monitoring).

Figures of the one-third octave band spectra for these occasions are compared to the objectives for both L_{eq} and L_{90} spectra in Appendix A figures A1 to A17. Figures A35 to A43 compare one-third octave band spectra from 4 Melbourne to those from the North Fence.

From the measurements in the residential receiver locations, the low frequency assessment was made on the $L_{Aeq,15\text{-}min}$ as per the Noise Policy for Industry. Exceedance of the screening test values were identified on five occasions out of eleven measurements for $L_{eq,15\text{-}min}$ at 4 Melbourne St, one of the two measurements from 12 Brisbane St. and none from the two measurements from Adelaide St.

One North Fence measurement was included in Table 4.5 primarily to further the Low Frequency Noise propagation (LFN) investigation for the residential receiver locations, as discussed below.

Referring to Table 4.5, four of the five evening and night-time measurements at 4 Melbourne St. had minor exceedances of the objectives (less than 2 dB), one of these was marginal (less than 0.5 dB) in the 50Hz band. These minor exceedances in the 50 Hz band could be explained to electrical items that were running locally.

There was one exceedance in the 160 Hz band (of 4 dB) at midnight on the 10 December. It is noted that in that same time period, the North Fence measurement (45.5 dB) was lower than the measurement at 4 Melbourne St (48.4 dB) in the 160 Hz band – this suggests another low frequency noise source was contributing to the Melbourne St receiver sound levels at that time, other than Berrima Cement Works. This is similar to the analyses made in the 2023 and 2022 assessments. It should be noted that a new petrol station has been built on the corner of Taylor Ave and Argyle St since 2020, which is about 230m from 4 Melbourne – this establishment may have equipment working at various times throughout the night that may explain the LFN observed.

Comparing to the 2023 LFN assessment, where 4 Melbourne St observed higher levels of low frequency sound between the 40 Hz to 80 Hz and the 160 Hz bands, this 2024 assessment had a significant reduction in sound levels in those bands. The only sound levels observed above that of the objective for residential receiver locations were in the 50 Hz band (and 160 Hz band as described above). This indicates that there is less low frequency noise observed in this survey compared to the 2023 Survey.

From the low frequency noise assessment of this survey, it is considered that the main source of low-frequency noise events being observed in the 50 Hz band are electrical items either in the residences or the new petrol station on the corner of Taylor Ave and Argyle St. There has been a significant reduction in road traffic noise associated with passing trucks, either from within New Berrima or on distant roads on the freeway, which was observed previously in the 63 Hz and 80Hz bands from the 2023 survey. The plant can be a source of the low frequency noise at times but this is not considered to be significant.

4.3 Attended measurement results and specific receiver locations

Attended measurements were taken at the same residential locations as the unattended measurements to identify the sources of noise occurring that were audible at the time, as well as other conditions. Attended monitoring was made during daytime on 27 November and daytime on 11 December.

Listening attended monitoring was also done for two logger locations – 4 Melbourne St and North Fence - for two day, three evening and four night-time periods. using the recordings from the three logger recording sound level meters. This listening "attended monitoring" was done at each location for the same 15-minute periods. These periods were:

- Thursday 28 November 00:00 am to 00:15 am Northerly — Night, all plant on except RM7, low speed
- Thursday 28 November 9:00 pm to 9:15 pm CBP, low speed Northerly — Evening, all plant on except RM7, Kiln 6 and
- Monday 2 December 00:00 am to 00:15 am — Night, all plant on except RM7, wind calm
- Wednesday 4 December 00:00 am to 00:15 am CM6, wind low speed 2.5m/s west-south-west. — Night, most plant off except Kiln 6, RM6 and
- Wednesday 4 December 9:00 pm to 9:15 pm CBP, wind low speed 1.0m/s easterly. — Evening, most plant on except RM7 and
- Friday 6 December 2:00 pm to 2:15 pm CM7, wind calm. — Daytime, most plant off except Kiln 6 and
- Tuesday 10 December 00:00 am to 00:15 am — Night-time, all plant on, calm wind
- Tuesday 10 December 2:00 pm to 2:15 pm — Daytime, all plant on except for CBP, calm
- Tuesday 10 December 9:00 pm to 9:15 pm CBP, wind low speed 2m/s north-east — Evening, plant on, all plant on except for

Night and evening periods were selected more than daytime because these are more likely to be periods of potential annoyance and road traffic noise is significantly reduced from daytime.

Table 4.6 provides a summary of all of the monitoring results and conditions and observations during each 15-minute period of attended or listening attended monitoring. They are also provided in Appendix F. Table 4.7 summarises these results without the comments. Table 4.8 compares the results for 4 Melbourne St and North Fence.

Figures 4.9 to 4.18 compare the statistical sound level results of $L_{Aeq,15\text{-}min}$, $L_{A90,15\text{-}min}$ and $L_{A01,15\text{-}min}$ for each location for day, evening and night periods.

Table 4.7 and Figure 4.9 shows that Adelaide St near Taylor Avenue has the highest levels of all parameters at any residential receiver location in daytime, with $L_{Aeq,15\text{-}min}$ for daytime of 65 dBA. 12

Brisbane St. had the lowest daytime $L_{Aeq,15\text{-}min}$. Night-time $L_{Aeq,15\text{-}min}$ levels were lowest at 4 Melbourne St with 41 to 45 dBA.

$L_{A90,15\text{-}min}$ sound levels also had the same variation with the lowest at 4 Melbourne St of 37 dBA at night-time and 36 dBA in the evening. Adelaide St had the highest $L_{A01,15\text{-}min}$ daytime sound levels because of its proximity to Taylor Avenue and the passing vehicles. The lowest $L_{A01,15\text{-}min}$ night-time sound level at 4 Melbourne St was 53 dBA and the highest was 57 dBA.

Figures of one-third octave band spectra and tonality spectra for all of the attended measurements are given in Appendix A. Tables A1 and A2 show the $L_{Aeq,15\text{-}min}$ and $L_{A90,15\text{-}min}$ one-third octave band spectra for the attended and listening measurements, with the tonality calculations shown in the bottom half of each table. The results in the tables show no measurement location had tonal criteria exceeded at frequencies below 1000 Hz for L_{Aeq} and in none of the bands for L_{A90}. Some L_{Aeq} measurements had criteria exceeded at 2000 Hz or above and these were considered to be caused by birds or insects and not from the Cement Plant.

Narrow band spectra for the attended monitoring have been prepared and are shown in Appendix E, with some major peaks in the frequency spectrum highlighted.

Listening attended monitoring sound recordings for 4 Melbourne St have been analysed for narrow-band frequency spectra, with periods of 20 seconds to 2 minutes for quieter periods within different parts of each recording to only include times without extraneous sources, such as vehicle passbys. These are provided in Appendix E. Figures E1 to E59 in Appendix E show the narrow band spectra analysed from the site sound recordings. The time histories of the listening periods are shown in Appendix F, Figures F1 to F9. Each set of spectra for each measurement period (for example 28/11/2024 from midnight to 00:15am is one set of measurements from different periods in the same recording) shows the overall 15-minute spectrum, then subsequent shorter period spectra. For each individual period analysis, the logarithmic and linear frequency scale graphs are shown side by side for 0 to 4000 Hz, 0 to 2000 Hz and 0 to 500 Hz. This means there are six spectra for each measurement period analysed. The spectra figure numbers in Appendix E related to the listening monitoring are as shown below:

- 28/11 midnight E1 to E7
- 28/11 21:00 E8 to E11
- 2/11 midnight E12 to E18
- 4/12 midnight E19 to E25
- 4/12 21:00 E26 to E31
- 6/12 14:00 E32 to E38
- 10/12 midnight E39 to E47
- 10/12 14:00 E48 to E53
- 10/12 21:00 E54 to E59

4.3.1 Comments on sound levels and results at residential 4 Melbourne St

Results for 4 Melbourne St attended measurements are shown in Tables 4.6 and 4.7 and Appendix F: Environmental Noise Level Assessment Reports, with unattended measurements shown in Appendix B and Table 4.1, long-term unattended results in Table 4.2. Results have been collected for this location since 2002. Attended measurements were obtained for daytime on 27 November and 11 December, with listening attended results for 22 November, 2, 4, 6 and 10 December.

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As in previous surveys, sound levels in residential receiver areas continue to be mainly caused by road traffic noise, both on Taylor Avenue or Melbourne Street, and from the Hume Freeway at night. The noise emissions from the Cement Plant form the background sound levels on most occasions. Cement Plant sources audible included broad band sources such as fans and some rail operations – loco noise and wagon wheel movement. Tonal noise was not evident on any occasions for the 15-minute sample periods. Average night-time period sound levels range from $L_{Aeq,night}$ 43 to 49 dBA and $L_{A90,night}$ 40 to 45 dBA.

One-third octave band sound levels are shown in Appendix A, Table A1 and A2 and spectra and tonality graphs are combined in Appendix A Figures A1 for $L_{Aeq,15\text{-}min}$ and A2 for $L_{A90,15\text{-}min}$. The spectra are relatively broad-band with very little or no tonality evident in either L_{Aeq} or L_{A90} results. L_{Aeq} spectra often show higher levels at higher frequencies compared to L_{A90} results – this is caused by insect noise.

Unattended sound levels shown on the two-day graphs of Appendix B show sound levels vary mainly diurnally with some influence from wind speed occasionally correlating with wind direction, but not all occasions, and there is little correlation of the effect from wind direction.

Appendix Figures F1 to F9 show time histories of the listening attended monitoring periods, with annotations showing the causes of the higher sound level events and Tables F1 to F9 showing the identified sources in each of the associated figures F1 to F9. Most of the higher events were caused by passing vehicles in Taylor Avenue or birds. Statistical sound levels and comments on sources and conditions for these measurements are given in Table 4.9.

For personal attended monitoring on the mornings of 27 November and 11 December, road traffic was the main source. The $L_{Aeq,15\text{-}min}$ were 57 dBA and 56 dBA and the $L_{A90,15\text{-}min}$ were 44 and 42 dBA respectively. Figures A3 and A4 show the one-third octave band spectra for these measurements, with significantly higher levels for the L_{Aeq}. The L_{A90} curve peaks in the 1250 Hz band for 27/11/24 and the 200 Hz band for the 11/12/24 measurement. The measurements for both parameters show the spectra were non-tonal.

For the listening monitoring, night-time assessments were all made for midnight to 12:15am on four nights – 28/11, 2/12, 4/12, 10/12. In these periods, time histories are shown in figures F1 to F4. They show that sound levels varied from about 38 to 45 dBA with occasional passing cars or trucks up to 60 dBA or higher. The ambient sound is background industrial noise from the Cement plant with variation in level from wind affecting fan noise. There were occasional noises observed from locomotives or train wagons moving but these were not considered to be significant sources as their sound level was within the ambient variation. On some occasions there were clicks in the sound from unknown sources considered to be close to the microphone, perhaps branches blowing in the wind. $L_{Aeq,15\text{-}min}$ were 41 to 45 dBA and $L_{A90,15\text{-}min}$ were 37 to 39 dBA.

Evening monitoring identified many more vehicle passbys on Taylor Avenue with trucks up to 69 dBA. All were done for the period 9:00 to 9:15pm on three evenings – 28/11, 4/12 and 10/12. These are shown in the time history graphs F5 to F7. Higher truck sound levels were associated with them passing over bumps in the road surface. On one evening there was also a dog barking in the near distance to 52 dBA. The ambient sound level was slightly higher than in night-time because there was more traffic. $L_{Aeq,15\text{-}min}$ were 43 to 50 dBA and $L_{A90,15\text{-}min}$ were 36 to 47 dBA.

Daytime listening monitoring was done for 2:00pm to 2:15pm for two days 6/12 and 10/12 December. Measurements had almost continuous traffic and the time histories are shown in figures F8 and F9.

Truck sound levels were up to 71 dBA and typically 10 dB higher than from cars. Industrial noise was the background between vehicle noise. Sound from birds was also evident in daytime - they had not been audible in the evening or night periods. $L_{Aeq,15\text{-}min}$ were 54 dBA for both periods and $L_{A90,15\text{-}min}$ were 45 to 46 dBA – these are 9 to 10 dB above the results from evening and night-time.

One-third octave band spectra for the listening monitoring at Melbourne St are provided in Appendix A Figures A3 to A13, grouped in order of night, evening and daytime. Night-time spectra show relatively higher levels in the 160 Hz and 200 Hz bands – from stack fan noise – but the highest bands are manly 800 to 1000 Hz. In none of the measurements was tonal noise above the objectives in the NPfI.

Narrow band graphs of the A-weighted spectra from listening monitoring are provided in Appendix E. The spectra showing 0 to 4000 Hz, for example in Figure E1, show no significant peaks above 1000 Hz and the higher peaks tend to be below 500 Hz. For example figure E3 shows the 0 to 500 Hz spectrum for the full 15-minute period from midnight to 12:15am on 28 November. The highest peaks are at 49 Hz, 133 Hz, 178 Hz and 201 Hz. The 178 to 201 Hz peaks are from the stack fan noise emissions. There is also a peak at 23 Hz which may be related to the rotational frequency of one of the mills – RM6, CM6 or CM7, although the cement mills have been identified previously at around 25 to 26 Hz. In some of the later short-period measurements for this interval, as in Figure E7 for 00:12:09 to 00:12:50, a peak at 183 Hz also appears next to the 178 Hz one. This is also thought to be a fan. Similar spectra occur for the other times analysed with slightly varying frequencies of major peaks caused by fans operating at different speeds, or other plant items operating.

4.3.2 12 Brisbane Street

Monitoring locations used for 12 Brisbane Street were the same as in the previous measurements from 2015. L_{Aeq} results are affected by road traffic noise from Taylor Avenue and Brisbane Street. Cement Plant noise emissions also contribute at this location. Tables 4.2 and 4.2A and Figure 4.3A shows the results of unattended monitoring from 2015 to 2020 and attended monitoring from 2020 to 2024. Daytime $L_{Aeq,15\text{-}min}$ and $L_{A90,15\text{-}min}$ results are lower than for the past two years at 47 and 38 dBA respectively.

Results for attended measurements are shown in Table 4.6 and summarised in Table 4.7 and Appendix F: Environmental Noise Level Assessment Report. Tables 4.2 and 4.2A show long-term averages of results, which are also shown graphically as a time history in Figure 4.3A. Tables A1 and A2 have the one-third octave band spectra and tonality assessment with Figures A14 and A15 showing graphs of the one-third octave band spectra and tonality. As with the other locations tonality objectives were not exceeded at this location. The spectra are considered to be broadband.

Attended measurements were made on the afternoon of 27 November from 12:39pm and morning of 11 December from 10:17am. Noise sources heard on 27/11 were cars and trucks on Taylor Avenue and Brisbane St, distant highway traffic noise (probably because of the westerly wind at the time), distant dogs barking and Cement plant noise. The daytime sound levels of $L_{Aeq,15\text{-}min}$ 56 dBA is relatively high but related to the number of truck movements in the street and Taylor Ave; the $L_{A90,15\text{-}min}$ of 43 dBA is considered to be acceptable for daytime.

On 11/12 birds and a garden blower were also a feature of the noise and sound levels were lower than on 27/11. Sound levels were also relatively quieter than 4 Melbourne St because of the added distance and shielding from Taylor Avenue. The daytime sound levels of $L_{Aeq,15\text{-}min}$ 47 dBA and $L_{A90,15\text{-}min}$ 38 dBA are considered to be well in the acceptable range for residential receivers.

4.3.3 Taylor Avenue – Corner Adelaide St

The location used for the attended measurements is in Adelaide Street, 20m north of Taylor Avenue which is in-line with the front façade of the residence at 72 Taylor Ave. Attended measurements were obtained for daytime on 27 November from 12:59pm and daytime on 11 December from 10:37am. Results are provided in Table 4.6 and 4.7.

Tables 4.2 and 4.2A and Figure 4.3B shows the results of unattended monitoring from 2015 to 2020 and attended monitoring from 2020 to 2024. Daytime $L_{Aeq,15\text{-}min}$ results are the same as for the past two years at 61 and in a similar range to all previous measurements. The sound levels are relatively high because of the proximity of the location to traffic on Taylor Avenue. The $L_{A90,15\text{-}min}$ results are slightly lower than for the past two years at 46 dBA.

One-third octave band spectra are shown in Figures A16 and A17. The tonality assessment was provided in Table A2 and showed no exceedance of the objectives. Both sets of spectra are broadband, with some peaks in the 80 and 160 Hz bands of the L_{Aeq} spectra, considered to be related to truck exhaust noise emissions along Taylor Ave. The L_{A90} spectra shows a combination of vehicle and plant noise with the addition of a peak at 200 Hz.

For the attended measurement on the afternoon of 27 November, the $L_{Aeq,15\text{-}min}$ was 65 dBA and the $L_{A90,15\text{-}min}$ 48 dBA, with ambient levels, mainly from industrial noise, between road traffic at 45 to 46 dBA. Relatively high sound levels from heavy vehicles were up to 85 dBA (bus air brakes) and 79 from the bus rattling over road surface bumps.

For the monitoring on the morning of 11/12, the $L_{Aeq,15\text{-}min}$ was 61 dBA and the $L_{A90,15\text{-}min}$ 46 dBA. A dog barking in the house at 72 Taylor Ave was included for a short time in the measurement period. Sound in the 160 Hz and 200 Hz one-third octave bands were audible during the monitoring and are apparent in the spectrum of Figure A17.

L_{Aeq} results for this location are controlled by motor vehicle noise passing on Taylor Avenue and whether trucks pass over bumps in the road surface, causing high short-term levels.

Cement Plant site sources identified included the gate alarm from the eastern (Truck) access gate opening.

4.3.4 Northern Boundary

Attended sound levels at the Northern Boundary have been measured at the northern end of the stockyard, this survey the attended measurements were made at the inside location next to the unattended meter.

Results for attended measurements are shown in Appendix F: Environmental Noise Level Assessment Report, and summarised in Table 4.7, with unattended measurements shown in Appendix C. Table 4.1 has long-term unattended results and historical data from 2015 to present is shown in Table 4.2 and Figures 4.2. Average period $L_{Aeq,period}$ sound levels were the same as last year with 51 dBA in all periods (day, evening and night). This was the same as or 1 dB lower than the overall long-term average since 2015. Average period $L_{A90,period}$ sound levels were lower than the previous two years at 47 dBA for all periods. These were 1 dB below the overall long-term average since 2015.

Personal attended sound levels were measured on 27 November and 11 December. Listening attended monitoring was done for the same five periods as for 4 Melbourne St. Tables A1 and A2

have the one-third octave band spectra and tonality assessments. Appendix A Figures A18 and A19 show the spectra and tonality assessments for all periods at the North Fence. Both L_{Aeq} and L_{A90} spectra are non-tonal below 2000 Hz. Some measurements with high frequency tonal exceedances are considered to have been caused by insect noise and not the Cement plant.

Figures A20 to A30 show the individual one-third octave band measurements for each period monitored.

The main sources of noise at this location are the Cement plant and road traffic along Taylor Avenue, with occasional wind in vegetation noise with higher wind speeds and bird noise during the day.

For the listening attended monitoring done on the same periods as at 4 Melbourne St, time-history graphs with annotated events have been prepare and are provided in figures F10 to F18. They show that sound levels are relatively constant except for events from trucks and train movements and occasional plant noise.

4.3.5 Location 20 Store Yard Close location

This location has become the Environment Protection Licence noise compliance monitoring location to indicate achievement of compliance, without significant intrusion from other external noise sources (traffic) outside the plant boundary. The licence condition is for the $L_{A90,15\text{-minutes}}$ not to exceed 58 dBA (measured according to the methods of the Noise Policy for Industry, without transient or extraneous noise sources). Objectives are also for a long-term $L_{A90,period}$ over 7 days of 56 dBA .

Earlier discussion of the results of this monitoring was provided in Section 4.2. The results indicated that for the whole of the monitoring period, sound levels from allowable periods (no rainfall or high wind speeds) were in compliance with the licence condition for $L_{A90,15\text{-min}}$ not to exceed 58 dBA and the long-term average sound levels were 53 dBA $L_{A90,period}$ compared to the objective of 56 dBA.

Results discussed in this section are for attended monitoring and associated one-third octave band and narrow-band analyses. Results of the attended monitoring are given in Tables 4.6 and 4.7, Appendix F: Environmental Noise Level Assessment Report, and summarised in Table 4.8. Appendix D provides the unattended sound level results.

Main sources were industrial noise of fans from the main parts of the plant, locomotive and train movements at times (sometimes with wheel squeal), internal traffic movements and at times vehicles on Taylor Avenue. Pneumatic impulse noise from the air-cannons on the Pre-heater tower were also noted.

Tables A1 and A2 show one-third octave band and tonality assessments, for the attended monitoring at all locations. The results for Location 20 show no measurements were considered to be tonal. Figures A31 and A32 show the combined L_{Aeq} and L_{A90} spectra and tonality assessment. None of the spectra were found to be tonal for both sets of measurements. Figures A33 and A34 show the individual measurement spectra.

Unattended sound levels shown in the two-day graphs of Appendix D show fairly constant sound levels for $L_{Aeq,15\text{-min}}$ between 53 and 62 dBA and for $L_{A90,15\text{-min}}$ 50 to 56 dBA. Wind speed had an effect with slightly increased levels but direction less of an observable effect, on both $L_{Aeq,15\text{-min}}$ and $L_{A90,15\text{-min}}$ sound levels. Of more effect was operation of plant, with CM6 and CM7 idle periods giving reduced sound levels. For the occasions when the whole plant was off, sound levels were less than 50 dBA.

4.3.6 Comparison of One-third Octave Band Spectra for Listening monitoring

The listening monitoring of the three locations for the same periods provides an opportunity to compare the frequency spectra. This has been done in Figures A35 to A43 for both $L_{Aeq,15\text{-}min}$ and $L_{A90,15\text{-}min}$ parameters. These show differences between the relative contributions of the stack fan emissions in the 160 to 200 Hz bands at each location – the relative contribution is less for the site locations than the residential location. The minor peak in the 25 Hz band is also evident in both spectra, thought to be related to the Cement Mill rotation.

There are also times in the evening and especially daytime where the L_{Aeq} spectral bands at 4 Melbourne St are higher than those for the North Fence (Figures A40, A42 and A43), indicating the influence of road traffic noise. The total band sound levels are also higher during daytime and evening than at night-time, as would be expected.

4.4 Plant source sound levels

Plant source sound levels are measured by attended monitoring in eleven areas around major plant items or plant-edge boundary locations on all sides of the plant. The same locations are used each year to compare with results of previous years to identify if any major sources have significantly increased sound levels. Measurements are typically done for 30-seconds to 1-minute at each location. These measurements are done to comply with the requirements of the NPfI. Identifying if plant noise sources are changing significantly is considered to be a key part of an assessment and valuable information for the plant operator.

Table 4.9 has the results of measurements with comparisons back 10 years to 2014. Where the 2024 result is more than 5 dB greater than a previous measurement, this is indicated in pink shading and red-font in the table.

The results indicate that there are variations in sound levels at some locations, often caused by locally open doorways for maintenance at the time of the measurement or other short-term activity occurring.

Three locations had increases to consider. These were near the centre of the kiln on the northern side, on the eastern side of the Radicon Cooler and RM6 western doorway. Sound levels in the central kiln area have increased from the additional compressed-air cooling systems placed on the northern side of the centre of the kiln to manage kiln hot spots. These are relatively high-frequency sound levels and attenuate relatively quickly with distance from atmospheric absorption and don't add to received sound levels in residential areas.

Radicon Cooler sound levels vary depending on the load of the variable-speed fans which provide the cooling. In summer times more of the 12 fans on the cooler would be operating at high speeds, causing higher sound levels than would have been measured in the early spring measurements of earlier years. This variation would be in the normal range of operations.

RM6 western doorway sound levels often vary depending on whether the doorway is open or closed for a maintenance activity. There was noted to be some higher-frequency sound from RM6 (in the 1kHz and 1.25 kHz one-third octave bands which were up to 16 dB above adjacent bands) at this location, which would have significantly increased the sound level compared to previous years. This can be seen by comparing figure A44 from 2024 measurements with A45 from 2021 measurements. These increased levels would be attenuated in the atmosphere and are not expected to be an issue for residential receivers.

Table 4.1 Comparison of Period LAEQ, Period Average LA10 and Period 90% LA90 Results

Summary of Statistical Data

$L_{AEQ.15min}$	Day			Evening			Night			24 hour		
	Max $L_{AEQ.Day}$	Min $L_{AEQ.Day}$	Ave $L_{AEQ.Day}$	Max $L_{AEQ.Eve.}$	Min $L_{AEQ.Eve.}$	Ave $L_{AEQ.Eve.}$	Max $L_{AEQ.Night}$	Min $L_{AEQ.Night}$	Ave $L_{AEQ.Night}$	Max $L_{AEQ.24hr}$	Min $L_{AEQ.24hr}$	Ave. $L_{AEQ.24hr}$
Location 20 - Cement Works	59	54	57	57	52	55	57	54	56	62	52	56
4 Melbourne St., New Berrima	56	50	53	52	47	49	52	46	48	55	46	50
North Fence, New Berrima	53	48	51	53	48	51	54	48	51	53	48	50

L90.15-min 10%	Day				Evening				Night			
	Max $L_{A90.Day}$	Min $L_{A90.Day}$	Ave $L_{A90.Day}$	Median $L_{A90.Day}$	Max $L_{A90.Eve.}$	Min $L_{A90.Eve.}$	Ave $L_{A90.Eve.}$	Median $L_{A90.Eve.}$	Max $L_{A90.Night}$	Min $L_{A90.Night}$	Ave $L_{A90.Night}$	Median $L_{A90.Night}$
Location 20 - Cement Works	53	50	51	51	54	49	52	51	54	49	52	52
4 Melbourne St., New Berrima	44	37	40	40	44	35	39	38	44	36	39	38
North Fence, New Berrima	48	43	45	45	51	43	46	44	48	44	46	45

L90.15-min	Day				Evening				Night			
	Max $L_{A90.Day}$	Min $L_{A90.Day}$	Ave $L_{A90.Day}$	Median $L_{A90.Day}$	Max $L_{A90.Eve.}$	Min $L_{A90.Eve.}$	Ave $L_{A90.Eve.}$	Median $L_{A90.Eve.}$	Max $L_{A90.Night}$	Min $L_{A90.Night}$	Ave $L_{A90.Night}$	Median $L_{A90.Night}$
Location 20 - Cement Works	54	51	53	52	55	51	53	52	55	52	53	53
4 Melbourne St., New Berrima	45	40	42	42	46	37	41	41	45	37	41	41
North Fence, New Berrima	50	44	47	46	51	45	47	45	49	45	47	47

Table 4.2: Boral Cement Berrima - 2024 Annual Environmental Noise Review:
Comparison of statistical sound levels 2002 to 2024

Receiver Location 4 Melbourne Street

Parameter	Period	Survey Dates																													Statistics			
		Sep-02	Jan-03	Feb-03	Feb-04	Mar-04	Apr-04	May-04	Sep-04	Jan-06	Feb-06	Jun-06	Apr-07	Jun-08	Dec-08	Sep-10	Jun-11	Jul-11	Jul-12	Oct-12	Oct-12	Sep-13	Aug-14	Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day	57	50	54	55	54	56	54	54	56	56	58	56	55	57	56	52	56	56	55	56	53	56	57			56	53	52	53	54	53	52	53	53	58	50	55	1.9
	Evening	53	48	54	54	65	53	51	50	60	57	53	52	54	59	53	52	51	51	50	52	50	53	52			53	49	49	48	49	48	49	51	49	65	48	52	3.8
	Night	53	44	49	47	49	50	51	49	51	51	51	52	51	56	52	50	50	51	49	51	51	52	52			52	48	48	47	47	47	48	49	48	56	44	50	2.3
LA90.ave	Day	46	40	43	43	44	45	45	44	44	45	47	46	47	50	47	45	46	46	43	45	43	48	48			48	44	43	43	43	43	44	43	42	50	40	45	2.2
	Evening	44	39	42	42	42	44	45	43	45	46	47	46	46	49	46	39	39	45	40	39	42	47	46			46	42	42	42	42	42	43	43	41	49	39	43	2.7
	Night	44	37	41	39	40	44	45	43	42	46	46	46	45	50	46	38	38	44	36	40	42	47	45			46	42	42	42	41	41	42	43	41	50	36	43	3.2
10%LA90.med	Day	44	38	41	39	41	43	43	42	43	43	45	45	45	43	45	42	44	43	40	43	41	45	46			45	42	41	40	41	40	41	42	40	46	38	42	2.0
	Evening	42	37	40	40	39	42	44	42	43	43	45	44	45	46	43	38	41	42	33	34	41	45	44			45	41	41	40	41	39	42	41	38	46	33	41	3.1
	Night	42	35	39	37	37	42	43	41	42	43	44	44	44	44	44	38	40	41	29	34	40	44	43			43	40	40	39	38	39	41	39	38	44	29	40	3.4

Receiver Location 72 Taylor Ave near Adelaide St - Note for 2020 and after, results are from attended monitoring in Adelaide St adjacent to front of reside

Receiver Location 72 Taylor Ave near Adelaide St

Parameter	Period	Survey Dates																													Statistics			
		Sep-02	Jan-03	Feb-03	Feb-04	Mar-04	Apr-04	May-04	Jan-06	Feb-06	Feb-06	Jun-06	Apr-07	Jun-08	Dec-08	Sep-10	Jun-11	Jul-11	Jul-12	Oct-12	Oct-12	Sep-13	Aug-14	Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day								61	62	54	63	62	63	63	60	57	60	60	60	59	61	61	52			63	58	60	60	61	62	63	61	61	63	52	60	2.7
	Evening								57	58	50	59	57	59	59	56	57	53	55	54	48	57	55	47			58	54	55	54	51	58	59			59	47	55	3.5
	Night								56	56	49	58	56	59	58	56	55	56	55	52	48	60	55	50			58	53	55	54	52					60	48	55	3.3
LA90.ave	Day								47	45	41	48	48	49	49	47	46	47	49	45	48	50	47	49			50	46	47	48	51	45	47	48	46	51	41	47	2.1
	Evening								46	44	40	47	46	46	47	45	37	42	48	40	41	49	47	46			48	44	46	47	43	47	49			49	37	45	3.2
	Night								45	42	40	47	46	45	48	46	36	42	47	38	41	47	47	46			48	44	46	47	44					48	36	44	3.3
10%LA90.ave	Day								45	43	39	47	46	47	45	45	43	43	46	42	46	48	46	47			47	44	44	45	51	45				51	39	45	2.4
	Evening								45	42	40	46	45	46	44	44	39	44	46	39	40	49	46	44			46	43	45	45	41	47				49	39	44	2.7
	Night								44	41	39	46	45	46	43	43	38	42	46	35	39	45	46	45			45	44	45	44	44					46	35	43	3.0

Receiver Location 12 Brisbane Street - Note for 2020 and after, results are from attended monitoring

Receiver Location 12 Brisbane Street

Parameter	Period	Survey Dates																													Statistics			
		Sep-02	Jan-03	Feb-03	Feb-04	Mar-04	Apr-04	May-04	Sep-04	Jan-06	Feb-06	Jun-06	Apr-07	Jun-08	Aug-10	Sep-10	Jun-11	Jul-11				Sep-13	Aug-14	Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day														51	50	52	52				50	52	56			53	51	51	54	59	52	52	52	47	59	47	52	2.7
	Evening														46	46	48	47				47	48	49			49	47	49	51	41	54	49			54	41	48	2.9
	Night														48	47	45	46				48	48	48			48	46	49	49	42					49	42	47	1.9
LA90.ave	Day														44	44	43	45				41	45	47			47	43	46	46	47	42	39	47	38	47	38	44	2.8
	Evening														42	43	41	42				43	41	45			45	41	47	46	37	44	45			47	37	43	2.5
	Night														44	42	38	42				42	41	45			44	40	45	45	38					45	38	42	2.5
10%LA90.ave	Day														42	42	40	42				42	42	46			44	42	43	42	47	42				47	40	43	1.9
	Evening														41	41	37	41				42	42	43			43	41	44	43	36	44				44	36	41	2.4
	Night														39	41	35	40				39	42	44			41	40	44	43	38					44	35	41	2.5

Most Off Most on

Receiver Location 4 Northern Boundary

Receiver Location 4 Northern Boundary

Parameter	Period	Survey Dates																													Statistics			
		Sep-02	Jan-03	Feb-03	Feb-04	Mar-04	Apr-04	May-04	Sep-04	Jan-06	Feb-06	Jun-06	Apr-07	Jun-08	Aug-10	Sep-10	Jun-11	Jul-11	Jul-12	Oct-12	Oct-12	Sep-13	Aug-14	Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day	52												63	53	50	52	55	52	49	50	51	51	52	51	54	53	51	53	51	51	51	54	51	51	63	49	52	2.7
	Evening	52												54	51	49	49	51	50	45	49	50	50	51	50	51	53	49	53	51	51	51	52	51	51	54	45	51	1.8
	Night	53												54	51	50	47	52	51	44	50	49	51	52	51	52	52	49	52	51	51	51	53	51	51	54	44	51	2.1
LA90.ave	Day	48												53	49	47	47	51	48	43	46	44	47	49	49	51	49	47	49	48	48	47	48	48	47	53	43	48	2.1
	Evening	50												53	48	47	45	49	48	41	47	47	48	48	48	50	49	47	51	48	48	48	48	48	47	53	41	48	2.2
	Night	50												53	49	47	43	49	48	39	47	46	48	48	46	50	49	47	49	49	45	47	48	49	47	53	39	48	2.7
10%LA90.ave	Day	46												51	48	46	44	49	46	41	45	46	46	47	47	49	47	45	47	45	45	44	46	46	45	51	41	46	2.0
	Evening	48												51	47	46	42	49	46	40	46	45	47	47	46	49	47	45	50	46	47	46	48	48	44	51	40	47	2.4
	Night	48												51	47	47	42	48	46	37	45	44	47	48	48	49	47	45	48	46	45	45	47	47	45	51	37	46	2.7

Most Off Most on Most Off Most on

Receiver Location 20 Store Yard Close from 2015

Receiver Location 20 Store Yard Close from 2015

Parameter	Period	Survey Dates																													Statistics			
																						Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Nov-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day																					58		58	58	59	56	62	56	57	57	57	57	62	56	58	1.6
	Evening																					56		56	53	55	55	59	55	55	56	55	55	59	53	55	1.4
	Night																					57		56	53	57	55	57	55	56	56	56	56	57	53	56	1.1
LA90.ave	Day																					54		53	53	53	52	53	52	52	53	53	53	54	52	53	0.7
	Evening																					54		53	50	53	53	52	52	52	54	53	53	54	50	53	1.1
	Night																					54		53	50	54	53	53	53	52	53	54	53	54	50	53	1.1
10%LA90.ave	Day																					52		52	52	52	51	53	51	44	52	51	51	53	44	51	2.4
	Evening																					53		52	51	53	51	51	51	46	53	53	51	53	46	51	2.0
	Night																					51		52	51	53	52	52	51	45	52	52	52	53	45	51	2.1

Receiver Location Admin Building Roof South East Corner

Parameter	Period	Survey Dates									Statistics			
		Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day Leq	71	72	72	72	71	72	70	72	74	74	70	72	1.1
LA90.ave	Day L90	70	71	72	72	71	72	70	70	73	73	70	71	1.0

Table 4.2: Boral Cement Berrima - 2024 Annual Environmental Noise Review:
Comparison of statistical sound levels 2002 to 2024 continued
Receiver Location 4 Melbourne Street

Table 4.2A: Boral Cement Berrima - 2024 Annual Environmental Noise Review: Comparison of statistical sound levels 2015 to 2024

Receiver Location 4 Melbourne Street

Parameter	Period	Survey Dates												Statistics			
		Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day	57			56	53	52	53	54	53	52	53	53	58	50	55	1.9
	Evening	52			53	49	49	48	49	48	49	51	49	65	48	52	3.8
	Night	52			52	48	48	47	47	47	48	49	48	56	44	50	2.3
LA90.ave	Day	48			48	44	43	43	43	43	44	43	42	50	40	45	2.2
	Evening	46			46	42	42	42	42	42	43	43	41	49	39	43	2.7
	Night	45			46	42	42	42	41	41	42	43	41	50	36	43	3.2
10%LA90.med	Day	46			45	42	41	40	41	40	41	42	40	46	38	42	2.0
	Evening	44			45	41	41	40	41	39	42	41	38	46	33	41	3.1
	Night	43			43	40	40	39	38	39	41	39	38	44	29	40	3.4

Receiver Location 72 Receiver Location 72 Taylor Ave near Adelaide St

Parameter	Period	Survey Dates												Statistics			
		Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day	52			63	58	60	60	61	62	63	61	61	63	52	60	2.7
	Evening	47			58	54	55	54	51	58	59			59	47	55	3.5
	Night	50			58	53	55	54	52					60	48	55	3.3
LA90.ave	Day	49			50	46	47	48	51	45	47	48	46	51	41	47	2.1
	Evening	46			48	44	46	47	43	47	49			49	37	45	3.2
	Night	46			48	44	46	47	44					48	36	44	3.3
10%LA90.ave	Day	47			47	44	44	45	51	45				51	39	45	2.4
	Evening	44			46	43	45	45	41	47				49	39	44	2.7
	Night	45			45	44	45	44	44					46	35	43	3.0

Receiver Location 12 Receiver Location 12 Brisbane Street

Parameter	Period	Survey Dates												Statistics			
		Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day	56			53	51	51	54	59	52	52	52	47	59	47	52	2.7
	Evening	49			49	47	49	51	41	54	49			54	41	48	2.9
	Night	48			48	46	49	49	42					49	42	47	1.9
LA90.ave	Day	47			47	43	46	46	47	42	39	47	38	47	38	44	2.8
	Evening	45			45	41	47	46	37	44	45			47	37	43	2.5
	Night	45			44	40	45	45	38					45	38	42	2.5
10%LA90.ave	Day	46			44	42	43	42	47	42				47	40	43	1.9
	Evening	43			43	41	44	43	36	44				44	36	41	2.4
	Night	44			41	40	44	43	38					44	35	41	2.5

Receiver Location 4 N Receiver Location 4 Northern Boundary

Parameter	Period	Survey Dates												Statistics			
		Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day	52	51	54	53	51	53	51	51	51	54	51	51	63	49	52	2.7
	Evening	51	50	51	53	49	53	51	51	51	52	51	51	54	45	51	1.8
	Night	52	51	52	52	49	52	51	51	51	53	51	51	54	44	51	2.1
LA90.ave	Day	49	49	51	49	47	49	48	48	47	48	48	47	53	43	48	2.1
	Evening	48	48	50	49	47	51	48	48	48	48	48	47	53	41	48	2.2
	Night	48	46	50	49	47	49	49	45	47	48	49	47	53	39	48	2.7
10%LA90.ave	Day	47	47	49	47	45	47	45	45	44	46	46	45	51	41	46	2.0
	Evening	47	46	49	47	45	50	46	47	46	48	48	44	51	40	47	2.4
	Night	48	48	49	47	45	48	46	45	45	47	47	45	51	37	46	2.7

Receiver Location 20 Receiver Location 20 Store Yard Close from 2015

Parameter	Period	Survey Dates												Statistics			
		Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Nov-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day	58		58	58	59	56	62	56	57	57	57	57	62	56	58	1.6
	Evening	56		56	53	55	55	59	55	55	56	55	55	59	53	55	1.4
	Night	57		56	53	57	55	57	55	56	56	56	56	57	53	56	1.1
LA90.ave	Day	54		53	53	53	52	53	52	52	53	53	53	54	52	53	0.7
	Evening	54		53	50	53	53	52	52	52	54	53	53	54	50	53	1.1
	Night	54		53	50	54	53	53	53	52	53	54	53	54	50	53	1.1
10%LA90.ave	Day	52		52	52	52	51	53	51	44	52	51	51	53	44	51	2.4
	Evening	53		52	51	53	51	51	51	46	53	53	51	53	46	51	2.0
	Night	51		52	51	53	52	52	51	45	52	52	52	53	45	51	2.1

Receiver Location Admin Building Roof South East Corner

Parameter	Period	Survey Dates									Statistics			
		Jul-16	Sep-17	Jul-18	Sep-19	Oct-20	Oct-21	Oct-22	Dec-23	Dec-24	Max	Min	Ave	SD
LAEQ.ave	Day Leq	71	72	72	72	71	72	70	72	74	74	70	72	1.1
LA90.ave	Day L90	70	71	72	72	71	72	70	70	73	73	70	71	1.0

Table 4.3 : BoralCement Berrima Annual Environemtnal Noise December 2024 - Location 20 LA90,15-min Sound Level occurrences and percentages

LA90,15-	No. at	% at level	Cumulativ	-	Cumulativ	Percentile	LA90,15-
42	0	0.0%	0.00%	100.00%	0	0%	47.3
42.5	0	0.0%	0.00%	100.00%	0	1%	49.4
43	0	0.0%	0.00%	100.00%	0	2%	49.9
43.5	0	0.0%	0.00%	100.00%	0	3%	50.1
44	0	0.0%	0.00%	100.00%	0	4%	50.3
44.5	0	0.0%	0.00%	100.00%	0	5%	50.4
45	0	0.0%	0.00%	100.00%	0	10%	50.9
45.5	0	0.0%	0.00%	100.00%	0	15%	51.3
46	0	0.0%	0.00%	100.00%	0	20%	51.5
46.5	0	0.0%	0.00%	100.00%	0	25%	51.7
47	1	0.1%	0.00%	100.00%	0	30%	52.0
47.5	0	0.0%	0.08%	99.92%	1	40%	52.3
48	3	0.2%	0.08%	99.92%	1	50%	52.8
48.5	3	0.2%	0.32%	99.68%	4	60%	53.2
49	10	0.8%	0.56%	99.44%	7	70%	53.7
49.5	16	1.3%	1.36%	98.64%	17	75%	54.0
50	40	3.2%	2.64%	97.36%	33	80%	54.2
50.5	67	5.4%	5.85%	94.15%	73	85%	54.4
51	96	7.7%	11.22%	88.78%	140	90%	54.6
51.5	143	11.5%	18.91%	81.09%	236	95%	55.0
52	163	13.1%	30.37%	69.63%	379	96%	55.1
52.5	136	10.9%	43.43%	56.57%	542	97%	55.2
53	137	11.0%	54.33%	45.67%	678	97.5%	55.3
53.5	114	9.1%	65.30%	34.70%	815	98.0%	55.5
54	155	12.4%	74.44%	25.56%	929	98.5%	55.6
54.5	105	8.4%	86.86%	13.14%	1084	99.0%	55.8
55	32	2.6%	95.27%	4.73%	1189	99.1%	55.8
55.5	19	1.5%	97.84%	2.16%	1221	99.2%	55.9
56	7	0.6%	99.36%	0.64%	1240	99.3%	55.9
56.5	1	0.1%	99.92%	0.08%	1247	99.4%	56.0
57	0	0.0%	100.00%	0.00%	1248	99.5%	56.0
57.5	0	0.0%	100.00%	0.00%	1248	99.6%	56.1
58	0	0.0%	100.00%	0.00%	1248	99.7%	56.1
58.5	0	0.0%	100.00%	0.00%	1248	99.75%	56.1
59	0	0.0%	100.00%	0.00%	1248	99.80%	56.2
						99.85%	56.2
						99.90%	56.3
						99.95%	56.4
						100%	56.6

Table 4.4 Berrima Cement Annual Noise Assessment 2024

Survey of audible sources of the Sleep Disturbance parameter LA01.1min - LA90.15-min > 15 dBA
for Night-time exceedances at the Berrima Cement Works North Fence monitoring location 27 Novemeber to 11 December 2024

Date Time	Event Time	Time period	LA01.1min - LA 90.15-min dB	LA 1.1min dB	L90	Observations in period	Prominent Noise
28/11/24 4:00	28/11/24 4:02	4	28.8	79	50.0	birds	birds
28/11/24 4:00	28/11/24 4:04	4	29.2	79	50.0	birds Vehicle	birds
28/11/24 4:00	28/11/24 4:03	4	29.7	80	50.0	birds	birds
28/11/24 4:00	28/11/24 4:05	4	28.8	79	50.0	birds	birds
28/11/24 4:15	28/11/24 4:21	4	16.2	66	49.3	birds	birds
28/11/24 4:15	28/11/24 4:26	4	16.9	66	49.3	birds	birds
28/11/24 5:15	28/11/24 5:16	5	17.8	68	50.4	Birds truck	Birds
28/11/24 5:15	28/11/24 5:17	5	18.1	69	50.4	Birds	Birds
28/11/24 5:15	28/11/24 5:18	5	17.8	68	50.4	Birds truck	Birds
28/11/24 5:15	28/11/24 5:19	5	19.0	69	50.4	Birds truck over bumps	Birds
28/11/24 5:15	28/11/24 5:20	5	17.4	68	50.4	Birds truck over bumps	Birds
28/11/24 5:15	28/11/24 5:21	5	17.8	68	50.4	Birds truck	Birds
28/11/24 5:15	28/11/24 5:22	5	18.3	69	50.4	Birds Thump	Birds
28/11/24 5:15	28/11/24 5:23	5	18.7	69	50.4	Birds	Birds
28/11/24 5:15	28/11/24 5:24	5	17.3	68	50.4	Birds Thump truck	Birds
28/11/24 5:15	28/11/24 5:25	5	25.6	76	50.4	Birds	Birds
28/11/24 5:15	28/11/24 5:26	5	17.4	68	50.4	Birds	Birds
28/11/24 5:15	28/11/24 5:27	5	18.1	69	50.4	Birds	Birds
28/11/24 5:15	28/11/24 5:28	5	18.3	69	50.4	Birds truck over bumps truck,Thump	Birds
29/11/24 3:45	29/11/24 3:46	3	18.2	63	44.9	birds	birds
29/11/24 3:45	29/11/24 3:47	3	17.4	62	44.9	birds	birds
29/11/24 3:45	29/11/24 3:48	3	19.7	65	44.9	birds	birds
29/11/24 3:45	29/11/24 3:49	3	18.6	64	44.9	birds	birds
29/11/24 3:45	29/11/24 3:50	3	17.5	62	44.9	birds	birds
29/11/24 3:45	29/11/24 3:51	3	19.2	64	44.9	birds	birds
29/11/24 3:45	29/11/24 3:52	3	19.6	65	44.9	birds	birds
29/11/24 3:45	29/11/24 3:53	3	19.4	64	44.9	birds	birds
29/11/24 3:45	29/11/24 3:54	3	19.4	64	44.9	birds	birds
29/11/24 3:45	29/11/24 3:55	3	18.1	63	44.9	birds Thump	birds
29/11/24 3:45	29/11/24 3:56	3	17.9	63	44.9	birds	birds
29/11/24 3:45	29/11/24 3:57	3	19.6	65	44.9	birds	birds
29/11/24 3:45	29/11/24 3:58	3	17.4	62	44.9	birds	birds
29/11/24 3:45	29/11/24 3:59	3	19.1	64	44.9	birds	birds
29/11/24 3:45	29/11/24 4:00	3	18.5	63	44.9	birds	birds
30/11/24 22:00	30/11/24 22:15	22	24.9	70	45.1	Fireworks	Fireworks
30/11/24 22:00	30/11/24 22:13	22	19.6	65	45.1	rail squeal (early) fireworks at end	rail squeal (early)
30/11/24 22:00	30/11/24 22:14	22	27.8	73	45.1	Fireworks	Fireworks
1/12/24 5:45	1/12/24 5:59	5	20.8	67	46.1	Birds	Birds
2/12/24 4:30	2/12/24 4:35	4	17.4	64	46.9	Birds	Birds
2/12/24 4:30	2/12/24 4:43	4	19.9	67	46.9	Birds	Birds
2/12/24 4:30	2/12/24 4:36	4	16.2	63	46.9	Birds	Birds
2/12/24 4:45	2/12/24 4:48	4	17.2	65	47.4	Birds	Birds
3/12/24 4:00	3/12/24 4:14	4	18.0	67	48.5	Birds	Birds
3/12/24 4:00	3/12/24 4:15	4	15.8	64	48.5	Birds Truck	Birds
3/12/24 4:15	3/12/24 4:16	4	16.1	65	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:18	4	18.6	67	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:19	4	19.0	68	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:20	4	20.3	69	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:22	4	15.3	64	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:23	4	21.2	70	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:24	4	17.9	67	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:25	4	16.6	65	48.8	Birds	Birds
3/12/24 4:15	3/12/24 4:30	4	20.7	70	48.8	Birds	Birds
3/12/24 6:00	3/12/24 6:01	6	21.7	70	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:06	6	17.0	65	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:07	6	15.5	64	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:08	6	17.1	65	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:09	6	17.5	66	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:10	6	18.3	66	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:11	6	17.2	65	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:12	6	17.9	66	48.1	Birds Truck	Birds
3/12/24 6:00	3/12/24 6:13	6	16.2	64	48.1	Birds	Birds

Table 4.4 Berrima Cement Annual Noise Assessment 2024

Survey of audible sources of the Sleep Disturbance parameter LA01.1min - LA90.15-min > 15 dBA
for Night-time exceedances at the Berrima Cement Works North Fence monitoring location 27 Novemeber to 11 December 2024

Date Time	Event Time	Time period	LA01.1min - LA 90.15-min dB	LA 1.1min dB	L90	Observations in period	Prominent Noise
28/11/24 4:00	28/11/24 4:02	4	28.8	79	50.0	birds	birds
3/12/24 6:00	3/12/24 6:14	6	17.8	66	48.1	Birds	Birds
3/12/24 6:00	3/12/24 6:15	6	16.4	65	48.1	Birds	Birds
4/12/24 3:45	4/12/24 4:00	3	19.3	69	49.4	Birds	Birds
4/12/24 3:45	4/12/24 3:59	3	18.2	68	49.4	Birds	Birds
5/12/24 5:15	5/12/24 5:16	5	15.6	62	46.8	Birds Truck over bumps	Birds
5/12/24 5:15	5/12/24 5:17	5	16.2	63	46.8	Birds	Birds
5/12/24 5:15	5/12/24 5:18	5	17.2	64	46.8	Birds Truck over bumps	Birds
5/12/24 5:15	5/12/24 5:19	5	16.7	64	46.8	Birds Truck	Birds
5/12/24 5:15	5/12/24 5:20	5	15.8	63	46.8	Birds	Birds
5/12/24 5:15	5/12/24 5:21	5	16.2	63	46.8	Birds	Birds
5/12/24 5:15	5/12/24 5:23	5	15.1	62	46.8	Birds Truck over bumps	Birds
5/12/24 5:15	5/12/24 5:24	5	17.0	64	46.8	Birds	Birds
5/12/24 5:15	5/12/24 5:25	5	17.9	65	46.8	Birds	Birds
5/12/24 5:15	5/12/24 5:26	5	15.0	62	46.8	Birds Truck over bumps	Birds
5/12/24 5:15	5/12/24 5:27	5	17.5	64	46.8	Birds	Birds
5/12/24 5:15	5/12/24 5:28	5	18.5	65	46.8	Birds Truck over bumps	Birds
5/12/24 5:15	5/12/24 5:30	5	15.2	62	46.8	Birds	Birds
5/12/24 6:45	5/12/24 6:46	6	23.0	70	46.5	Birds Truck	Birds
5/12/24 6:45	5/12/24 6:47	6	23.3	70	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:48	6	22.6	69	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:49	6	21.2	68	46.5	Birds Truck over bumps	Birds
5/12/24 6:45	5/12/24 6:50	6	25.2	72	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:51	6	17.2	64	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:52	6	22.7	69	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:53	6	24.3	71	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:54	6	23.7	70	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:55	6	22.6	69	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:56	6	20.2	67	46.5	Birds	Birds
5/12/24 6:45	5/12/24 6:58	6	22.7	69	46.5	Birds	Birds
6/12/24 3:45	6/12/24 4:00	3	27.4	73	46.0	Birds Thump	Birds
6/12/24 3:45	6/12/24 3:59	3	26.6	73	46.0	Birds	Birds
6/12/24 3:45	6/12/24 3:58	3	26.1	72	46.0	Birds	Birds
6/12/24 3:45	6/12/24 3:57	3	24.8	71	46.0	Birds Truck	Birds
6/12/24 3:45	6/12/24 3:56	3	25.3	71	46.0	Birds	Birds
6/12/24 3:45	6/12/24 3:55	3	23.9	70	46.0	Birds Thump	Birds
6/12/24 3:45	6/12/24 3:54	3	22.6	69	46.0	Birds	Birds
7/12/24 22:30	7/12/24 22:38	22	23.9	71	47.2	Train Horn	Train Horn
8/12/24 3:45	8/12/24 3:59	3	23.5	69	45.7	Birds	Birds
8/12/24 3:45	8/12/24 4:00	3	27.0	73	45.7	Birds	Birds
9/12/24 23:00	9/12/24 23:02	23	15.1	62	46.4	Rail Squeal	Rail Squeal

Table 4.5 Low Frequency Noise Analysis for Attended Monitoring : Community Locations

Frequency (Hz) Criteria	10	13	16	20	25	32	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

							One third Octave Band Spectra												
Description	Condition	MeasureDateTime	Laeq	Lceq	initial screening (diff >15?)	Fail screening test for LNF 1= To Proceed	10 Hz	12_5 Hz	16 Hz	20 Hz	25 Hz	31_5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz
12 Brisbane St	Day	27/11/24 12:39	55.8	67.5	11.7	0	62	61	62	60	66	60	56.6	61	60	55	54.2	52.6	50
12 Brisbane St	Day	11/12/24 10:17	46.8	63.7	16.9	1	70	59	59	65	60	55	55	55	54	49	48.9	46.5	45.7
4 Melbourne St	Day	27/11/24 12:19	56.7	69.9	13.2	0	66	63	62	61	61	59	59.4	60	59	67	56.1	54.4	54.4
4 Melbourne St	Day	11/12/24 8:43	55.9	68.9	13.0	0	70	61	62	63	60	60	60.2	59	59	62	56.9	58.2	60.4
4 Melbourne St	Night	28/11/24	41.4	60.3	18.9	1	54	55	56	59	60	51	49.9	51	45	41	35.2	34.8	39.3
4 Melbourne St	Night	2/12/24	43.1	61.5	18.4	1	54	54	57	58	62	50	52.6	52	47	45	39.6	39.7	42.8
4 Melbourne St	Night	4/12/24	43.4	62.1	18.7	1	55	55	58	58	62	55	51.9	52	48	46	39.4	36.5	43.6
4 Melbourne St	Night	10/12/24	44.7	60.4	15.7	1	55	56	57	58	59	51	52.8	50	48	43	38.1	38.6	48.4
4 Melbourne St	Evening	28/11/24 21:00	42.8	59.3	16.5	1	45	49	50	51	61	49	47.5	49	46	42	37.9	35.9	39.7
4 Melbourne St	Evening	4/12/24 21:00	50.3	64.9	14.6	0	56	55	59	59	64	56	55.5	57	54	53	46.2	45.7	48.6
4 Melbourne St	Evening	10/12/24 21:00	49.5	63.7	14.2	0	56	56	59	61	61	58	57.6	56	52	48	43	40.7	47.8
4 Melbourne St	Day	10/12/24 14:00	53.6	67.1	13.5	0	57	58	60	60	63	61	59	61	59	57	49.1	50	51.4
4 Melbourne St	Day	6/12/24 14:00	53.5	67.4	13.9	0	57	59	58	59	60	59	61.3	61	60	61	54.9	51.6	53.5
Adelaide St 20m to Taylor Ave I	Day	27/11/24 12:59	64.5	78	13.5	0	72	70	69	67	66	64	63.9	62	70	75	62.2	65.1	68.7
Adelaide St 20m to Taylor Ave I	Day	11/12/24 10:37	61.4	72.9	11.5	0	70	62	64	66	64	63	62	62	63	67	58	58.5	64.6
North Fence *	Night	10/12/24	48.8	69.1	20.3	1	60	59	63	70	70	58	57.5	54	50	50	47.2	41.1	45.5

Frequency (H. (values)

			10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
			One third Octave Band Spectra Criteria values												
Description	Condition	MeasureDateTime	10 Hz	12_5 Hz	16 Hz	20 Hz	25 Hz	31_5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz
12 Brisbane St	Day	27/11/24 12:39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12 Brisbane St	Day	11/12/24 10:17	-21.6	-30.5	-26.7	-12.5	-8.6	-6.5	1.0	4.7	3.6	0.5	0.9	0.5	1.7
4 Melbourne St	Day	27/11/24 12:19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Melbourne St	Day	11/12/24 8:43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Melbourne St	Night	28/11/24	-38.1	-34.1	-29.5	-18.4	-9.0	-10.2	-4.1	1.0	-5.2	-6.6	-12.8	-11.2	-4.7
4 Melbourne St	Night	2/12/24	-38.2	-34.6	-29.2	-19.4	-7.3	-10.6	-1.4	2.1	-3.4	-3.0	-8.4	-6.3	-1.2
4 Melbourne St	Night	4/12/24	-37.5	-34.3	-28.0	-18.9	-7.0	-6.0	-2.1	2.4	-2.0	-1.9	-8.6	-9.5	-0.4
4 Melbourne St	Night	10/12/24	-37.5	-33.4	-28.6	-19.0	-10.3	-9.6	-1.2	0.4	-2.4	-5.5	-9.9	-7.4	4.4
4 Melbourne St	Evening	28/11/24 21:00	-46.7	-39.7	-35.7	-26.1	-8.5	-11.8	-6.5	-0.9	-4.0	-6.2	-10.1	-10.1	-4.3
4 Melbourne St	Evening	4/12/24 21:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Melbourne St	Evening	10/12/24 21:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Melbourne St	Day	10/12/24 14:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Melbourne St	Day	6/12/24 14:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adelaide St 20m to Taylor Ave I	Day	27/11/24 12:59	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adelaide St 20m to Taylor Ave I	Day	11/12/24 10:37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North Fence *	Night	10/12/24	-32.1	-30.3	-22.8	-7.3	0.8	-2.6	3.5	3.6	-0.1	1.5	-0.8	-4.9	1.5

** North Fence included for reference*

Day Time measurement: < 5 dB Compliant
marginal - less than 0.5 db exceedance
issues with Low freq Noise : +ve
North Fence Lower than Melbourne St
exceeds 5 dB

Table 4.6: Boral Cement Berrima - Annual Environmental Noise Assessment 27 November to 11 December 2024
Summary of attended monitoring in chronological order with observations

Location	Date	Time start	Period mm:ss	File No.	Statistical Sound Level - dBA							Comments
					LAeq,t	LA01,t	LA10,t	LA90,t	LCeq,t	LA01-LA90	LCeq-LAeq	
4 Melbourne St	27/11/24	12:19 pm	15:00	N1	57	68		44	70	24.0	13.2	29C, wind 2m/s W. Industry heard 43-45, surging 48; Car 54-63 over bump 65, car pass in street 65; Truck 56-70, double bogie over bump 66
12 Brisbane St	27/11/24	12:39 pm	15:00	N2	56	67		43	68	24.0	11.7	Industry Heard 42-43, Highway Noise audible 44 - 45, Car Taylor Ave 46-52 - over bump 55, Car Local 48 , 69 , 76, Trucks 51-61, Truck local 78, voice 45, Car door closing 48, Dogs barking distant
Adelaide St near Taylor Ave	27/11/24	12:59 pm	15:00	N3	65	76		48	78	28.0	13.5	Wind N-NW < 5 km/hr, Industry Heard 45-49, Motor Bike 62, Car 60 -72, Car Local 48 , 69 , 76,Trucks 72 - 76, Truck Air brakes 85, gate alarm ~ 48, Bus 79 - Rattle over bumps
Location 20	27/11/24	3:23 pm	15:00	N4	56	63		54	69	9.0	12.9	23C, wind 3.6 m/s W. Very light rain, industry heard 53-54, aircraft 57-60, car 65, truck Taylor 59, Pneumatic pulse @ SW corner 57
North Fence	27/11/24	3:46 pm	15:00	N5	51	58		48	66	10.0	14.4	23C, wind 3.6 m/s W. Industry Heard 48 49 surging to 55, Traffic Taylor 48 - 52, Mowing in green space paddock 51
4 Melbourne St	11/12/24	9:38:31 AM	0:03:42	1	60	67	63	44	71	23.0	11.0	Pre-cal 94.0. Mid to high cloud 6/8, wind 0.5 to 2.5m/s N, 16.5C. Passing traffic
4 Melbourne St	11/12/24	9:43:35 AM	0:14:00	2	56	67	59	42	69	24.9	13.0	Restart above. Trucks passing on Taylor, 64 to 73, cars 55 to 66, birds 50+, quiet is 40. Main sources trucks, birds, dogs barking
12 Brisbane St	11/12/24	10:17:57 AM	0:15:00	5	47	59	49	38	64	20.9	16.9	Noise from LF of blower or plane to N. Quieter here than 4MS - traffic more distant. Passing trucks in Taylor 50 to 54, 60 on bumps, cars in street 60 to 64, birds 45 to 62, train horn 47, cloud cover reducing now 4/8, wind 0 to 1.5m/s N mostly <1
Adelaide St	11/12/24	10:37:20 AM	0:15:00	6	61	74	63	46	73	28.0	11.5	Dog barking in house low level & to 70. Plant audible, trucks using exhaust brakes down hill to enter plant, birds, truck pass 71 to 78 on bumps. Quiet 46 to 48. Wind calm to <0.5m/s N. 160 & 200 Hz bands at times >10 dB on adjacent.
North Fence	11/12/24	10:17:00 AM	15:00	41	50	56		47	70	9.0	20.1	Calm Conditions - No Wind, Industry Heard 48 49 increase briefly 53-54, Truck Taylor 53, car Taylor 53, Truck local 55
Location 20	11/12/24	11:15:00 AM	15:00	42	57	68		54	72	14.0	15.3	Calm Conditions - No Wind, Industry heard 54-55, Truck Taylor 55, Truck local 76, loco 55, rail wheel squeal 55-57, rail movement 56, impact 56, birds 55-59
Admin Bld Roof SW	11/12/24	11:22:20 AM	0:01:00	8	72	73	72	72	81		9.2	Roof AC on
Admin Bld Roof SW	11/12/24	11:23:40 AM	0:01:00	9	70	72	71	70	80		9.6	Roof AC off
Admin Bld Roof SE	11/12/24	11:29:21 AM	0:01:00	13	74	77	75	73	81		7.1	
Admin Bld Roof NE	11/12/24	11:30:53 AM	0:01:01	14	74	75	74	73	81		6.9	

Copy with table of summary NA28 data 2024 Berrima 11122024.xlsx

Table 4.7: Boral Cement Berrima - Annual Environmental Noise Assessment 27/11 to 11/12/24
Summary of attended and listening monitoring statistical results

Location	Date	Time start	Period	File	Statistical Sound Level - dBA			
			mm:ss	No.	LAeq,t	LA01,t	LA10,t	LA90,t
4 Melbourne St	27/11/24	12:19 pm	15:00	N1	57	68		44
	28/11/24	12:00:00 am	15:00		41	53	40	37
	28/11/24	9:00:00 pm	15:00		43	55	44	36
	2/12/24	12:00:00 am	15:00		43	55	43	39
	4/12/24	12:00:00 am	15:00		43	54	43	39
	4/12/24	9:00:00 pm	15:00		50	62	51	45
	6/12/24	2:00:00 pm	15:00		54	65	57	45
	10/12/24	12:00:00 am	15:00		45	57	44	39
	10/12/24	2:00:00 pm	15:00		54	64	57	46
	10/12/24	9:00:00 pm	15:00		50	57	51	47
	11/12/24	9:43:35 am	14:00	2	56	67	59	42
12 Brisbane St	27/11/24	12:39 pm	15:00	N2	56	67		43
	11/12/24	10:17:57 am	15:00	5	47	59	49	38
Adelaide St near Taylor Ave	27/11/24	12:59:00 pm	15:00	N3	65	76		48
	11/12/24	10:37:20 am	15:00	6	61	74	63	46
North Fence	27/11/24	3:46:00 pm	15:00	N5	51	58		48
	28/11/24	12:00:00 am	15:00		48	51		47
	28/11/24	9:00:00 pm	15:00		48	50		47
	2/12/24	12:00:00 am	15:00		48	50		47
	4/12/24	12:00:00 am	15:00		43	54		39
	4/12/24	9:00:00 pm	15:00		51	54		49
	6/12/24	2:00:00 pm	15:00		53	66		48
	10/12/24	12:00:00 am	15:00		49	54		48
	10/12/24	2:00:00 pm	15:00		52	56		50
	10/12/24	9:00:00 pm	15:00		53	56		51
	11/12/24	10:17:00 am	15:00	41	50	56		47
Location 20	27/11/24	3:23:00 pm	15:00	N4	56	63		54
	11/12/24	11:15:00 am	15:00	42	57	68		54

Copy with table of summary NA28 data 2024 Berrima 11122024.xlsx

Table 4.8: Boral Cement Berrima - Annual Environmental Noise Assessment 27/11 to 11/12/24
Comparison of attended and listening monitoring statistical results for 4 Melbourne St and North Fence

Time of Day	Date	LA01			LAeq			LA90		
		4 Melb	NF	Diff	4 Melb	NF	Diff	4 Melb	NF	Diff
D	27/11/24	68	58	10.0	57	51	6.0	44	48	-4.0
N	28/11/24	41	51	-9.6	53	48	5.2	37	47	-9.8
E	28/11/24	43	50	-7.2	55	48	6.6	36	47	-11.4
N	2/12/24	43	50	-6.9	55	48	6.8	39	47	-8.4
N	4/12/24	43	54	-10.6	54	43	11.2	39	39	0.3
E	4/12/24	50	54	-3.7	62	51	11.4	45	49	-3.8
D	6/12/24	54	66	-12.5	65	53	11.9	45	48	-3.4
N	10/12/24	45	54	-9.3	57	49	7.7	39	48	-8.7
D	10/12/24	54	56	-2.4	64	52	11.6	46	50	-3.9
E	10/12/24	50	56	-6.5	57	53	3.7	47	51	-4.3
D	11/12/24	67	56	11.3	56	50	5.9	42	47	-4.6

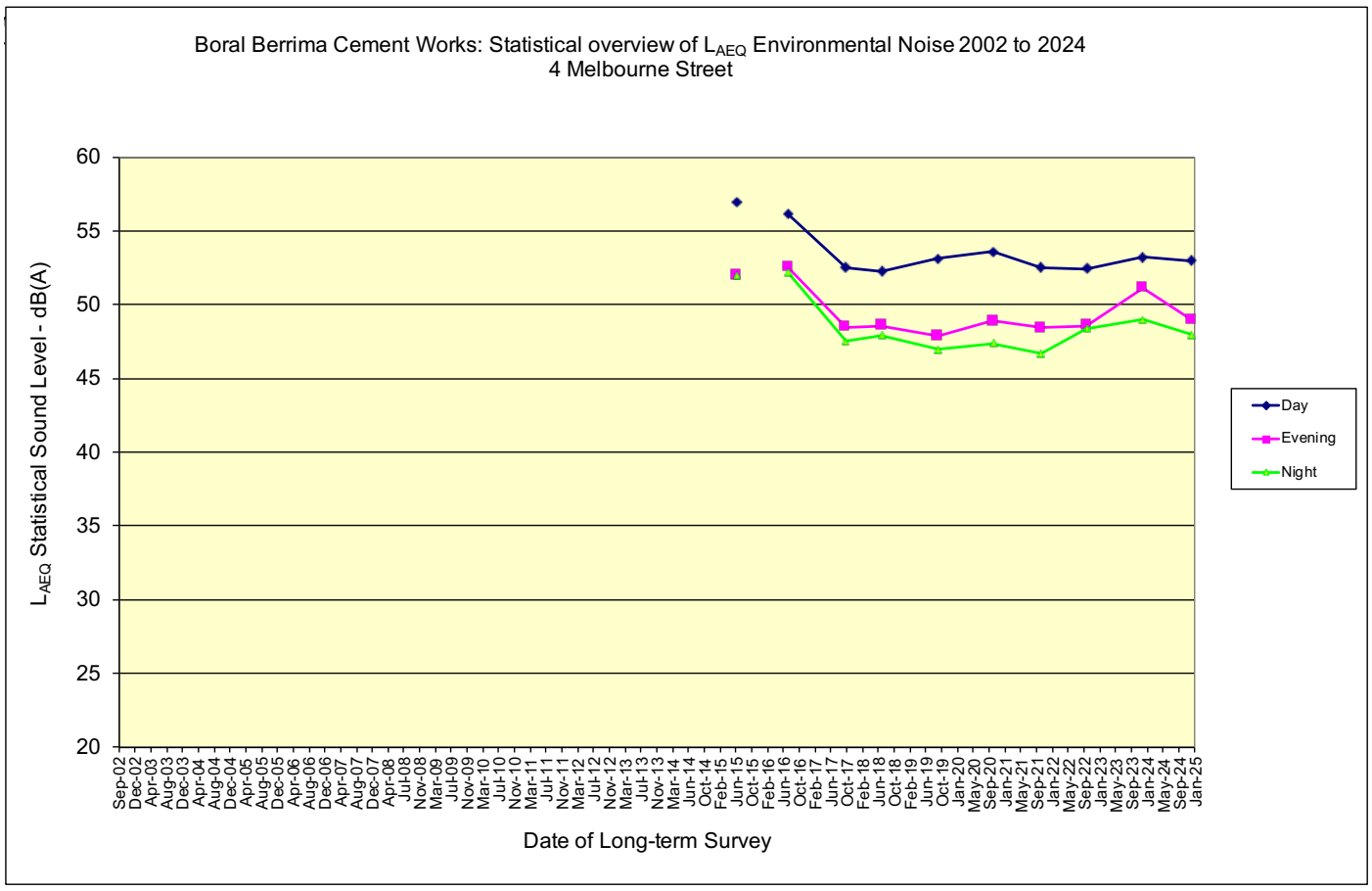
Copy with table of summary NA28 data 2024 Berrima 11122024.xlsx

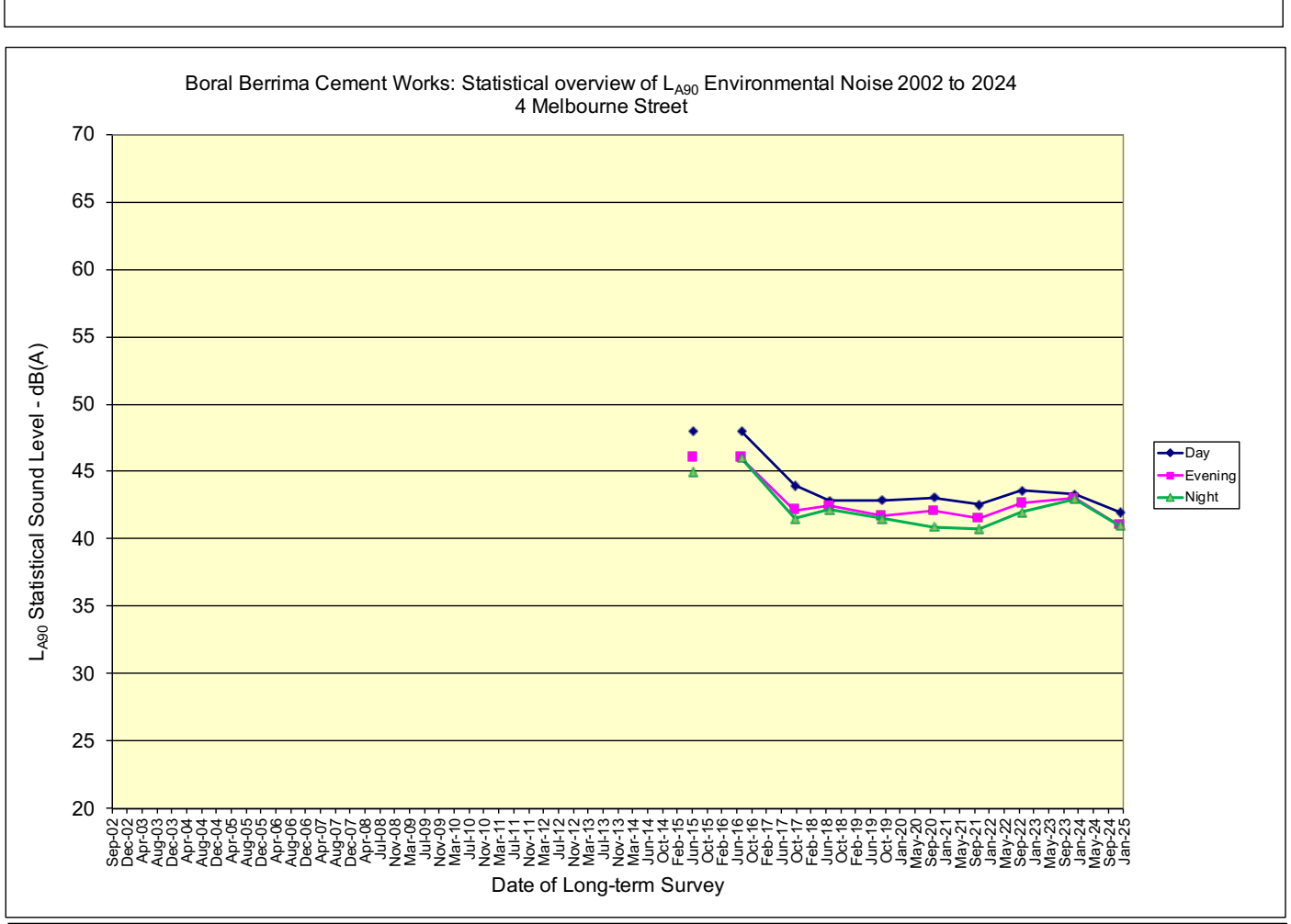
Table 4.9: Boral Cement Berrima Annual Noise 2024 - Locations with an increase in LAeq results with those of Previous Years from 2014

Area	Location	2024		SPL	SPL													Difference 2024 to Previous LAeq results									
			2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2024-2023	2024-2022	2024-2021	2024-2020	2024-2019	2024-2018	2024-2017	2024-2016	2024-2015	20242014
Fenceline South	Former Gate site opp W end Firing floor	51	60	62	62	60	57	58										-9	-11	-11	-9	-6	-7				
	Top N edge of bank opposite centre pedestal	52	61		61	52	51	54										-9		-9	0	1	-2				
	Top N edge bank Opposite E side old PHT	54	57	59	59	58	60	56										-3	-5	-5	-4	-6	-2				
N side Kiln	#56' Road kerb N side opp. Opening to FA38	78	76	73	75	77	75	76	78	77	79	82	84	86				2	5	3	1	3	2	0	1	-1	-4
	#59 FA 39 N side on kerb	81	81	80	80	81	79	80	81	80	81	81	86	85				0	1	1	0	2	1	0	1	0	0
	60 Opp Conditioning Tower	82	83		81	84	78	81	81	80	84	80	82	81	84	83	83	-1		1	-2	4	1	1	2	-2	2
	60' Opp. Stack	82	81		80	79	79	79										1		2	3	3	3				
	61 Kiln 6 road Northern side of @ 13m to PHT				79		79	79	82	78	80							0	0		0						0
	61 Opp. Centre PHT	81	81		80	80		78	77	77								0		1	1		3	4	4		
	62 Opp E side of old PHT	81	81		79	78		78	78	76	78	78	78	79	79	79		0		2	3		3	3	5	3	3
	62 Opp E side PHT	81	81		80													0		1							
	63 Opp. W pedestal	86	81		81	78		77	77	77	80	77	78	79	81	80		5		5	8		9	9	9	6	9
	65 Opp column for return duct W side	86		85	85	83	85	81	80	81	85	81	86	85	85	82	83		1	1	3	1	5	6	5	1	5
	66 Opp centre pedestal	89	90	88	88	86	88	86	85	85	87	84	83	88	88	85	85	-1	1	1	3	1	3	4	4	2	5
	68 Opp E pedestal	89	90	74	87	86	89	86	86	86	86	86	87	88	88	88	88	-2	15	2	3	-1	3	3	3	3	3
Radicon Cooler	L1 E side 2.4m	84	78	78	85	78	77	77										6	6	-1	6	7	7				
	L1 E side 6m	82	77		79	77	75	75										5		3	5	7	7				
	L1 E side 12m	80	77	74	78	74	72	73										3	6	2	6	8	7				
CM Fan	43A Kerb E side CM opp CM fan discharge	77	79	83	72	78	77	72	75	80	77	78	79	78				-2	-6	5	-1	0	5	2	-3	0	-1
CoalRoad S	33 Coal Road S side Centre Blending Silo	68	69	71	69	68	70	69	67	68	68	69	69	71	69	71	69	-1	-3	-1	0	-2	-1	1	0	0	-1
	35 Coal Road S side E side new PHT	71	71		70	69	71	68	67	68	68	70	68	71	70	70	69	0		1	2	0	3	4	3	3	1
	38 Coal Road S side centre pedestal	71	69	71	69	69	69	68	69	69	68	69	68	71	69	71	71	2	0	2	2	2	3	2	2	3	2
	42 Coal Road S side opposite grate	70	71	71	69	69	68	67	67	69	66							-1	-1	1	1	2	3	3	1	4	
Control Building Roof	Admin Roof SW	70	72	70	72	70	71	71	72	69								-2	0	-2	0	-1	-1	-2	1		
	Admin Roof SE	74	73	70	72	71	72	72	72	71								1	4	2	3	2	2	2	3		
	Admin Roof NE	74	72	70	71	72	72	70	72	68								2	4	3	2	2	4	2	6		
RM6	1' RM6 W door at kerb W side @ 13.3m	78	68	79	69	69	70	72	69	70	72	76	76	80	83	82	82	10	-1	9	9	8	6	9	8	6	2
CM7	A Top of stairs S	75	73	69	72	0	73	73	72	72	73	73	72	71	73	69	70	2	6	3		2	2	3	3	2	2
CM6	25 11m N of CM6 at joint		72		69	74	74	74	70	74	74	75	74						0								
	25 11m N of CM6 at joint	71	72		74		75	74	70	74	74	75	74					-1		-3		-4	-3	1	-3	-3	-4
	26 17m N of CM6	71	72		69	70	71	71	69	80	71	72	74	75		77		-1		2	1	0	0	2	-9	0	-1
Mineral Addition	1 Ground Level 6m W of hopper	66			70							67								-4							-1
	2 Ground level 8m S of hopper	75			77															-3							
	4 S Side of ramp 10m from E end of building	68			71							69								-3							-1
	6 Ground Level 8m N side of centre of feeder	67			73							61															6
CBP																											
Ground Level	A: N side opp. Fan motor @ 6.4m to motor end 8.4m to fan casing	75	77															-2									
	B: N side, Edge concrete between N columns opp. Pump	76	77															-1									
	D: Fan motor platform NW side 2.1m to fan shaft bearing at casing	75	81															-6									
	F: W side of fan platform area 3.97m to duct support	74	77															-3									
	G: S side of fan inlet platform@ 1.09m to duct	76	78															-2									
	H: S sideof plant at kerb on Kiln Roads opposite W side of PHT & stairway platform @ 4.7m	82	82															0									
	H': E side of plant opp. Big fan @ 9.0m and in-line with edge of tower columns	77	77															0									

NOTE: Red font and pink shading indicates a difference of greater than 5 dB to the 2024 results

Site source locations 2024 compared.xlsx





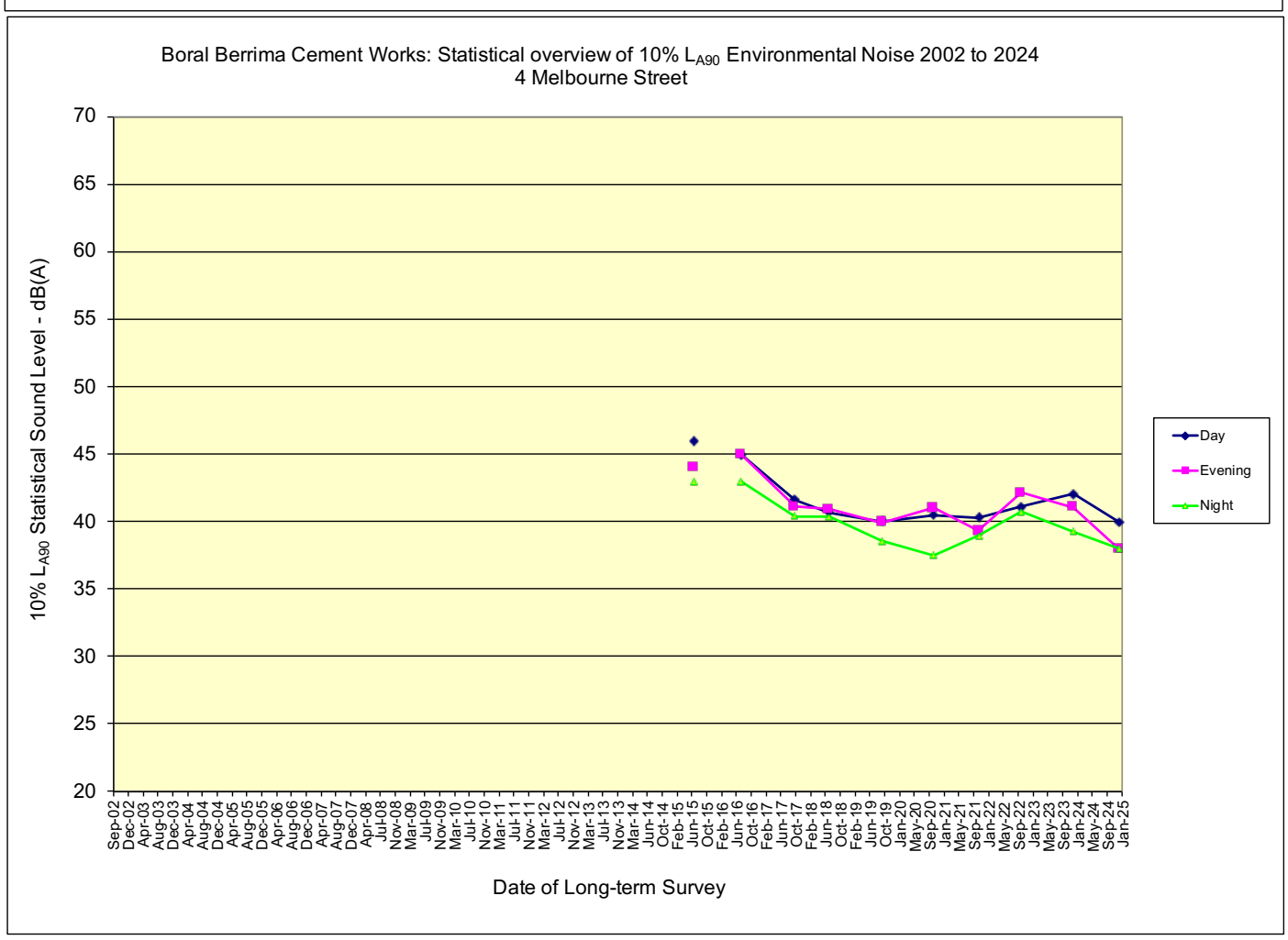


Figure 4.1: Comparison of statistical sound levels for 4 Melbourne Street location

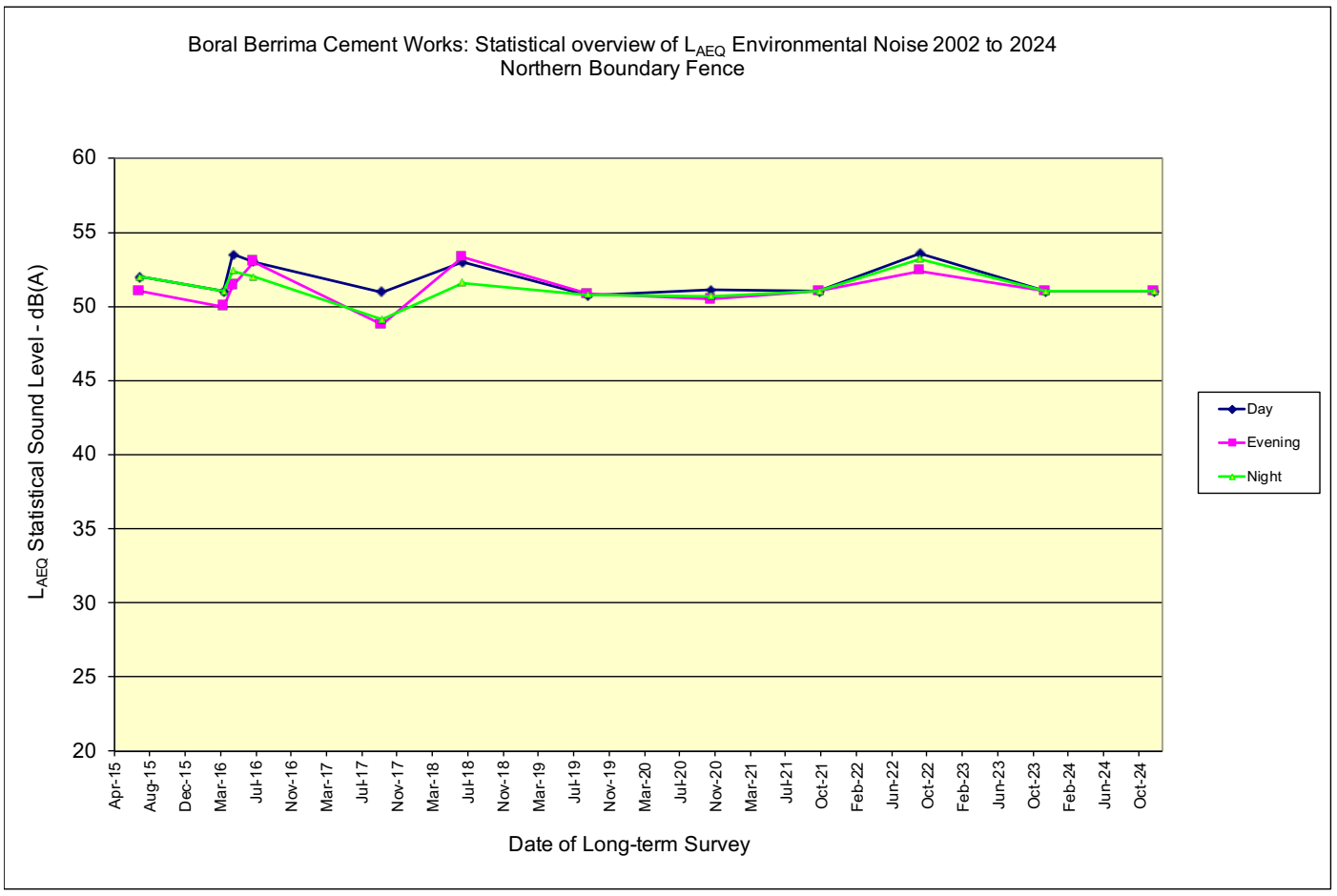


Figure 4.2: Comparison of statistical sound levels for Northern Boundary Fence location

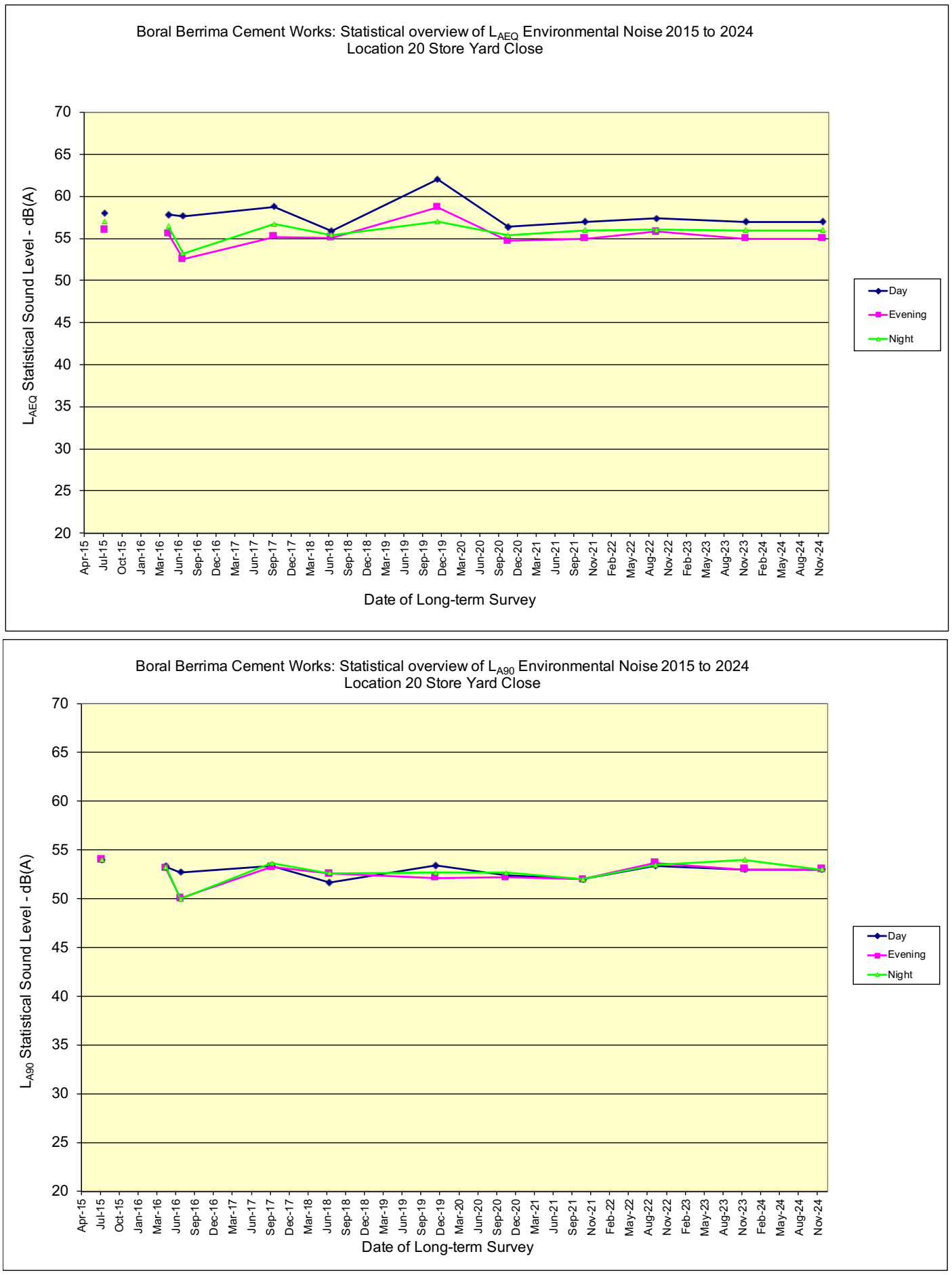
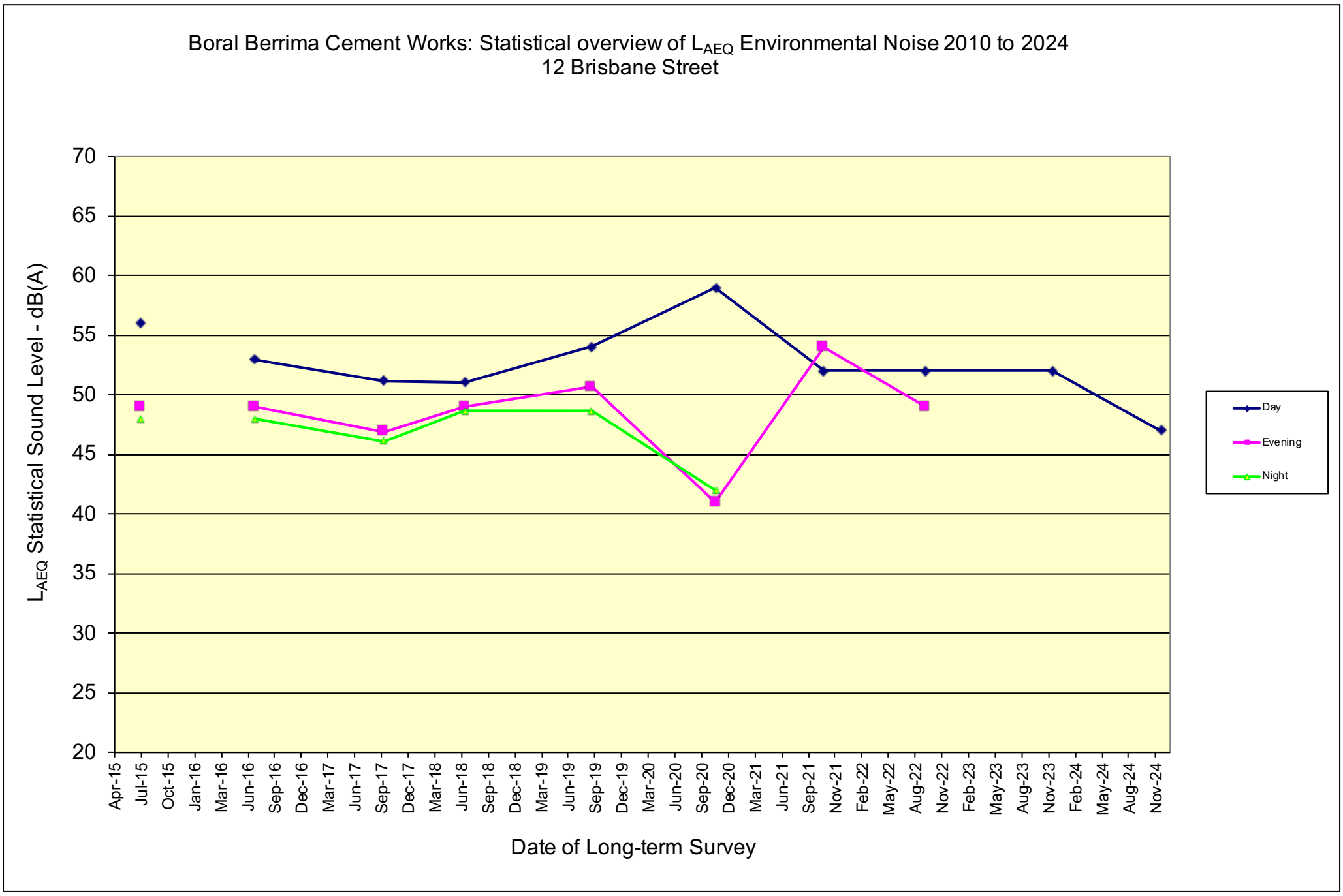


Figure 4.3: Comparison of statistical sound levels for Store Yard Close location



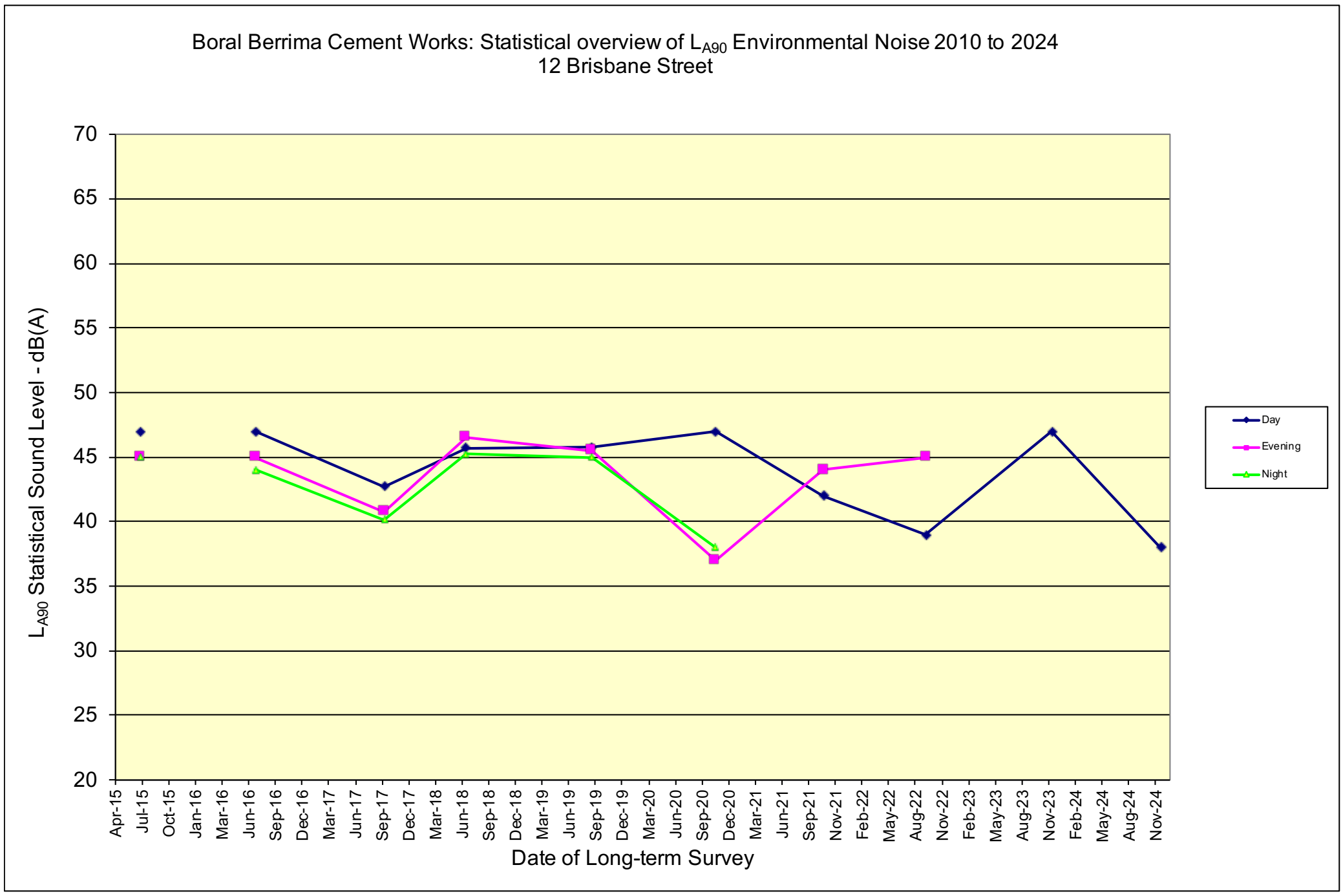
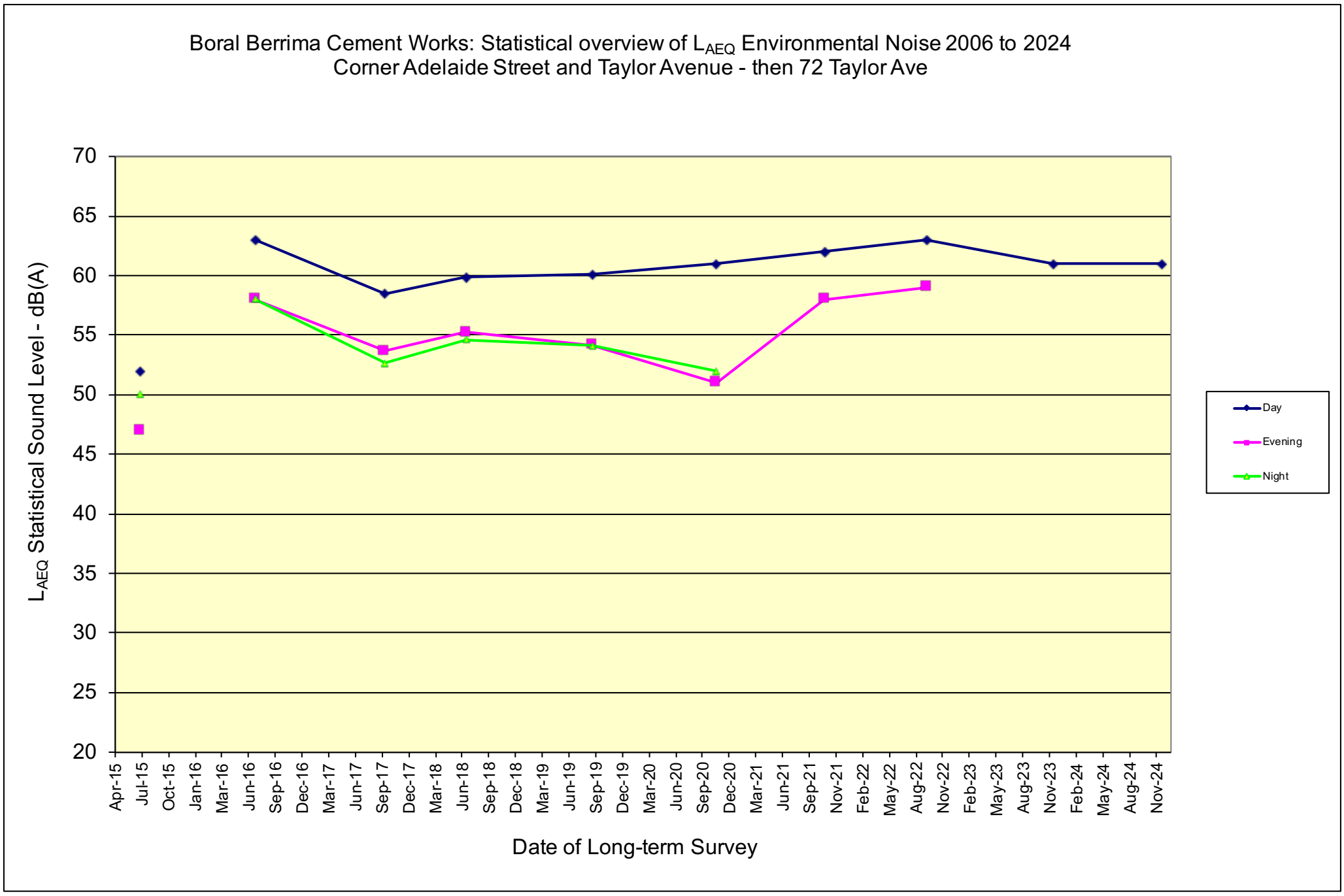


Figure 4.3A: Comparison of statistical sound levels for 12 Brisbane Street location



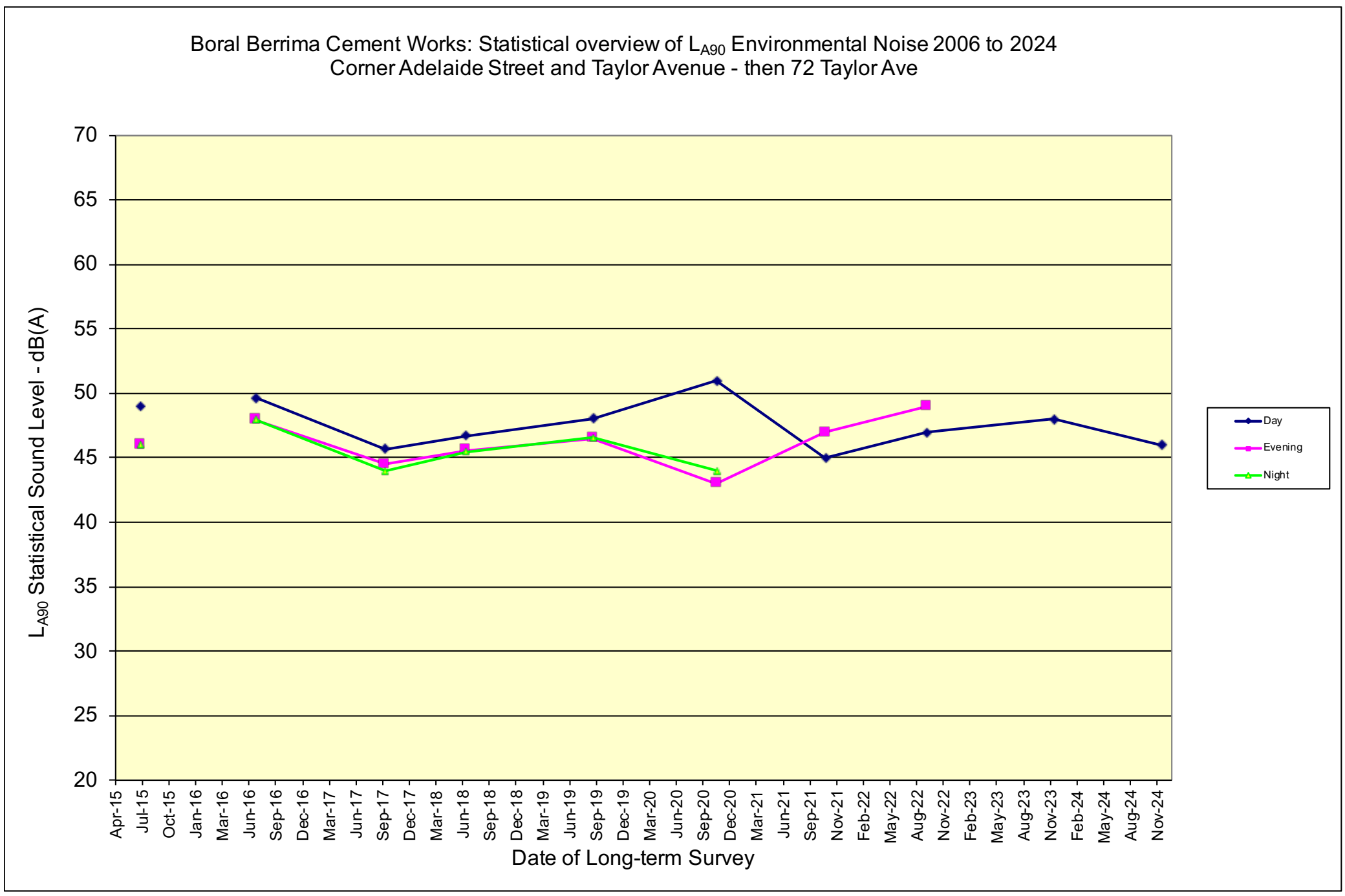


Figure 4.3B: Comparison of statistical sound levels for 72 Taylor Ave location

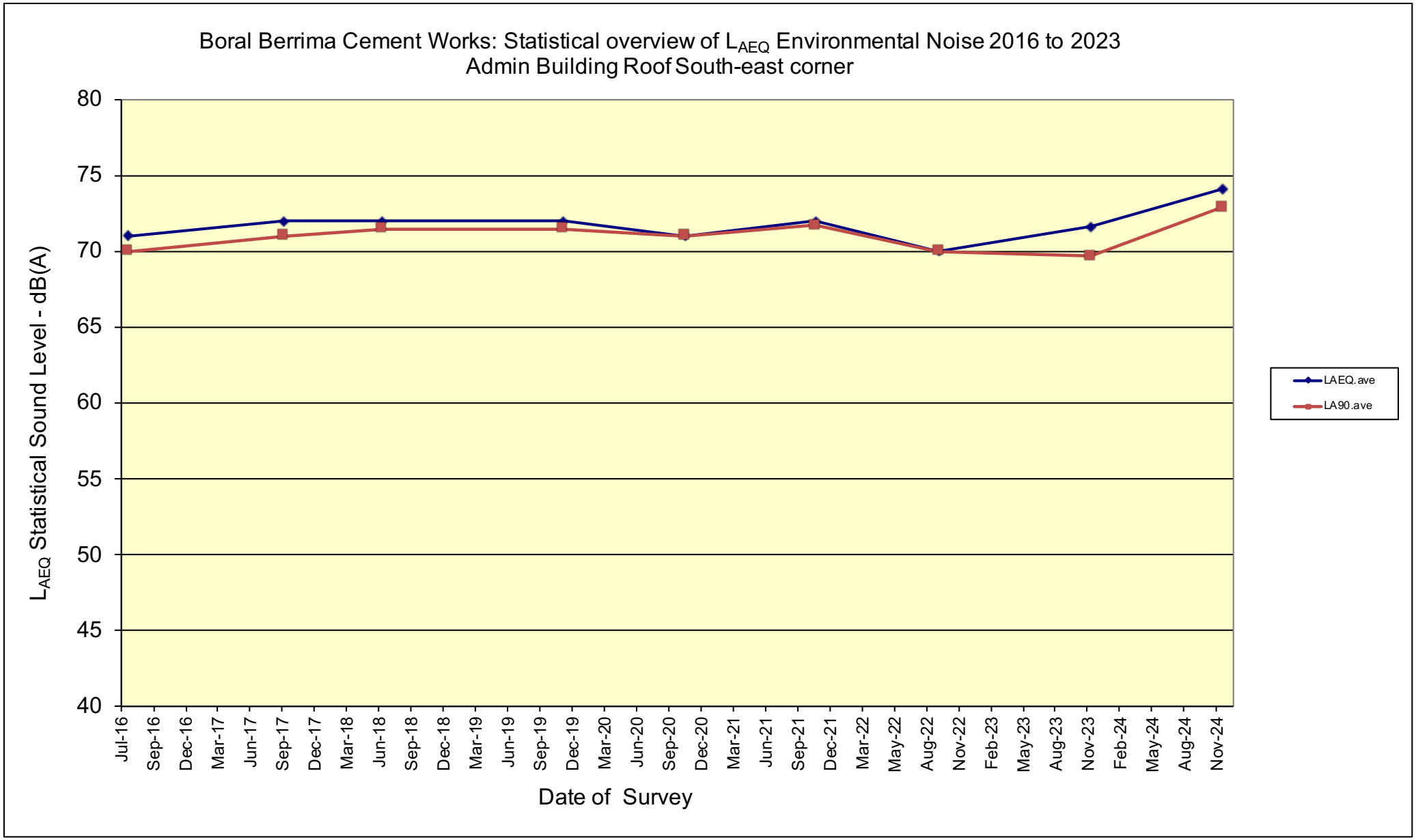


Figure 4.4: Comparison of short-term statistical sound levels for SE corner of Admin Building

Figure 4.5. : Boral Cement Berrima Annual Environmental Noise 2023 - Location 20 LA90,15-min sound levels occurrence

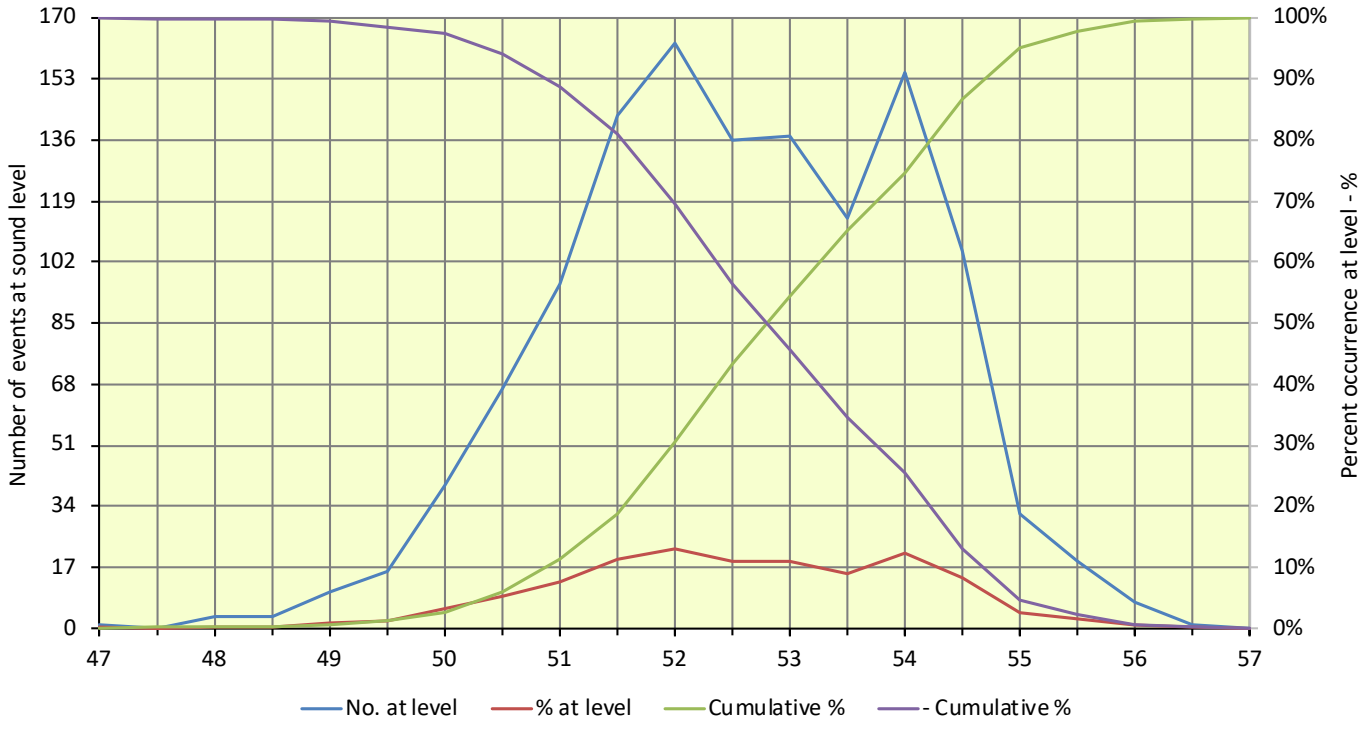


Figure 4.6 : Boral Cement Berrima Annual Environmental Noise 2024 - Location 20 LA90,15-min sound levels occurrence

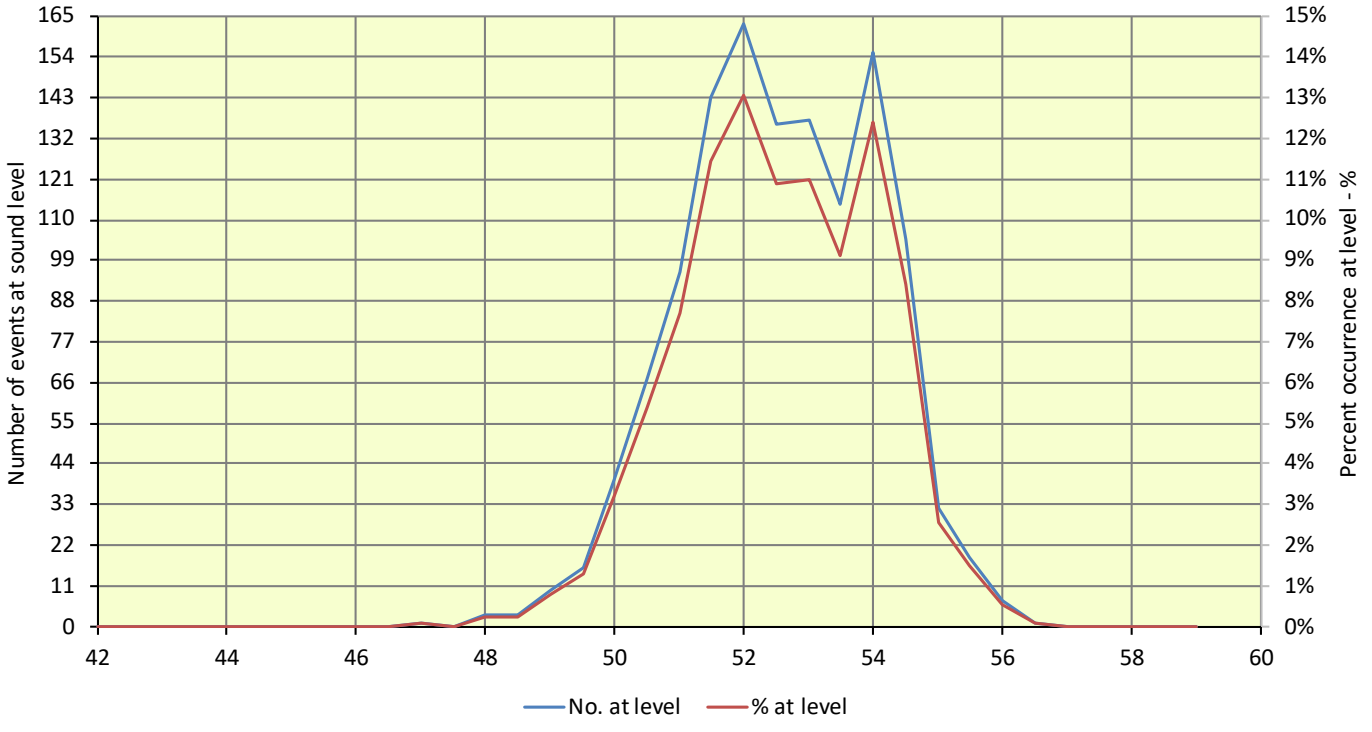


Figure 4.7 : Boral Cement Berrima Annual Environmental Noise November-December 2024-
Location 20 Percentile occurrence of LA90,15-min sound levels

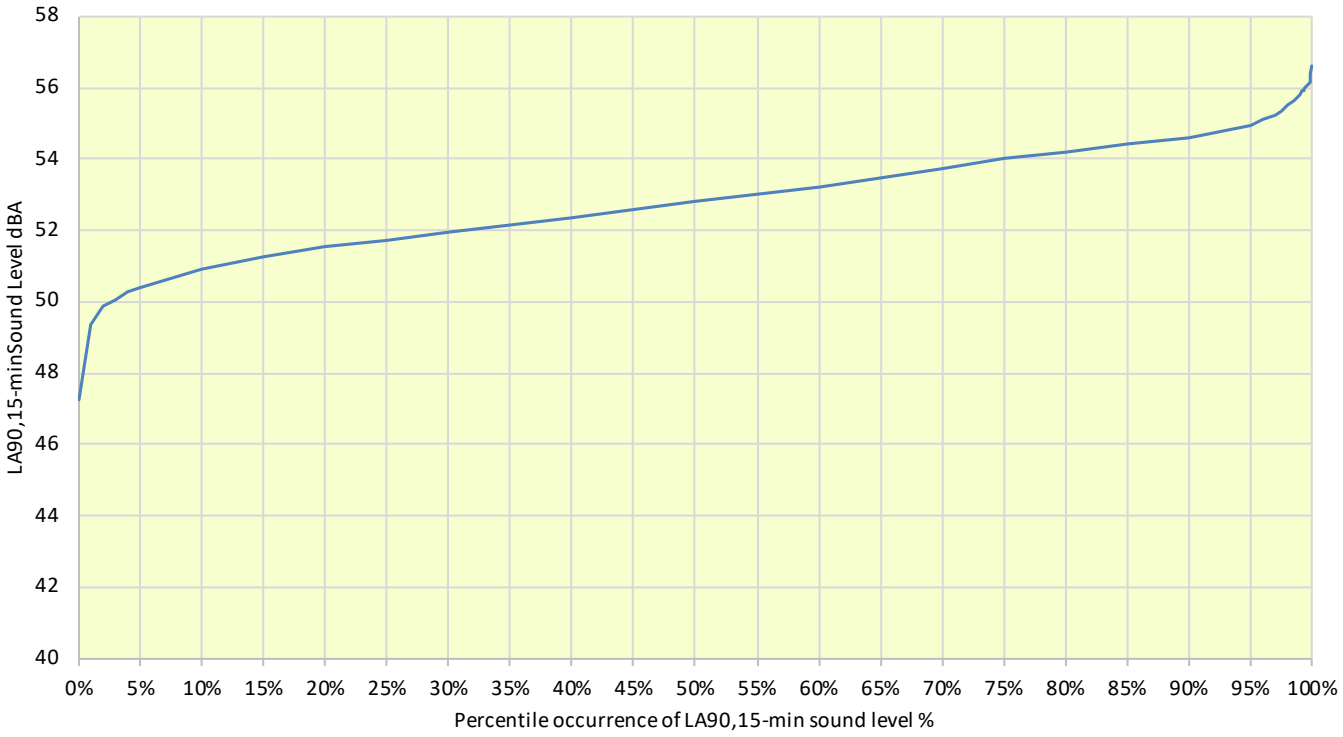


Figure 4.8 : Boral Cement Berrima Annual Environmental Noise November-December 2024 -
Location 20 Percentile occurrence of LA90,15-min sound levels

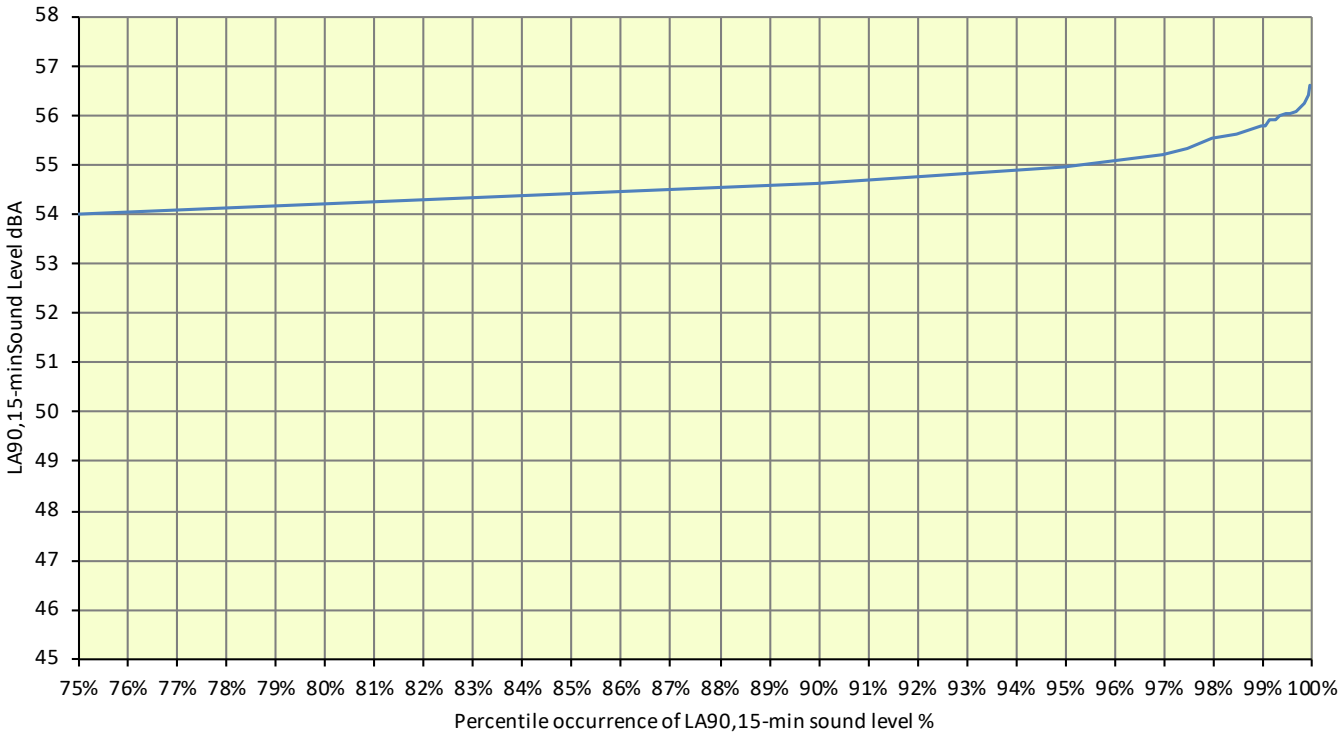


Figure 4.9 :Boral cement Berrima Annual Environmental Noise - 4 Melbourne St Attended monitoring Parameters All periods

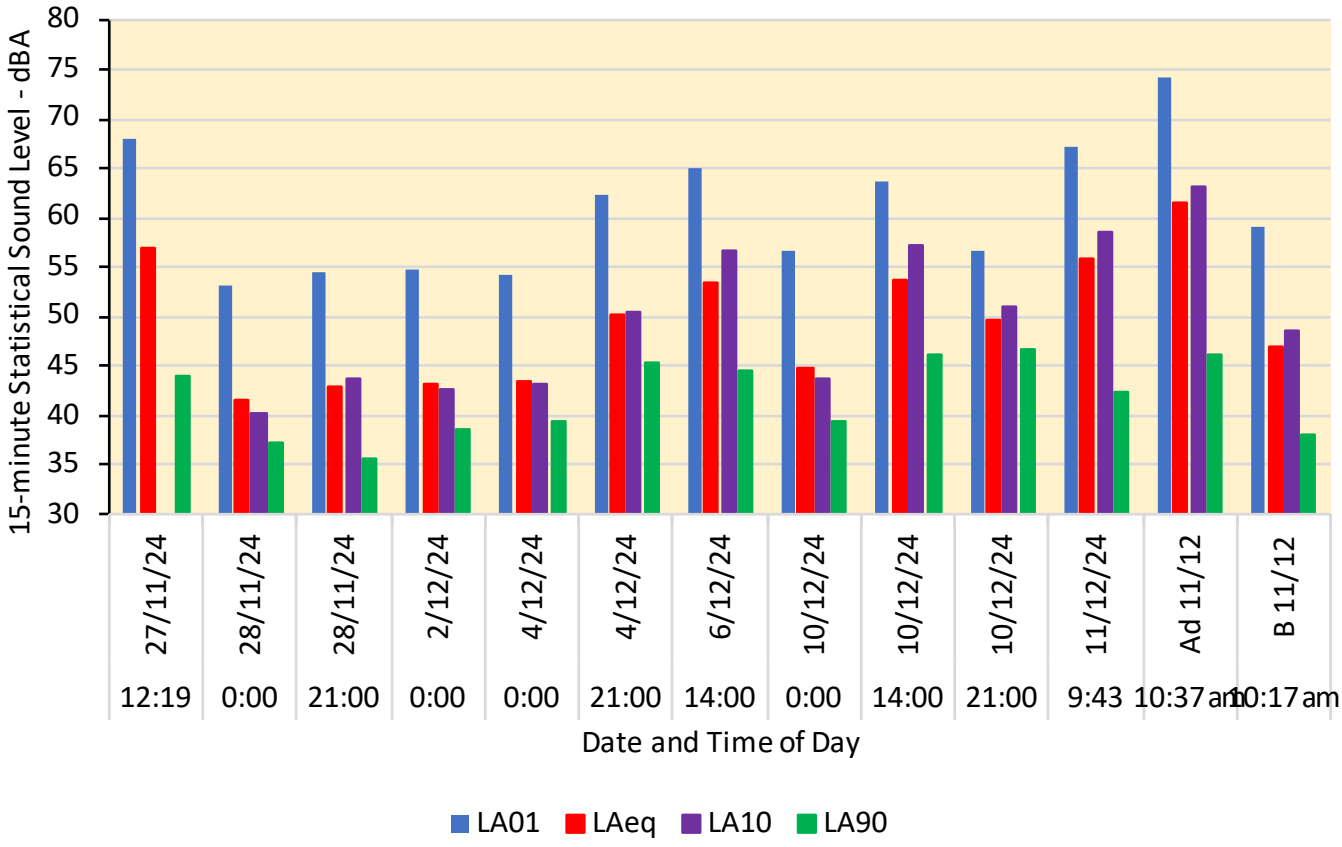


Figure 4.10: Boral cement Berrima Annual Environmental Noise - 4 Melbourne St Attended monitoring Parameters Night periods

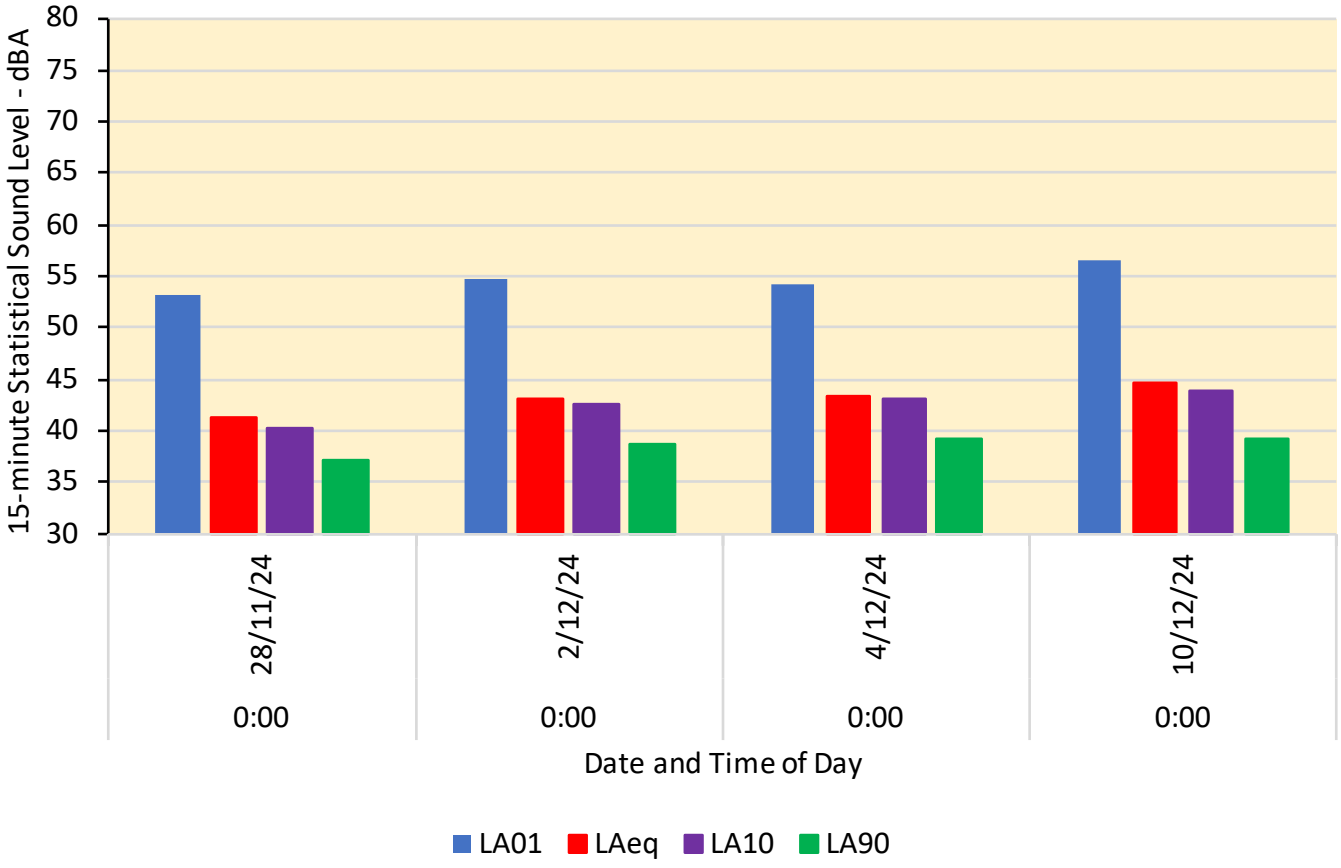


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Figure 4.11: Boral cement Berrima Annual Environmental Noise - 4 Melbourne St Attended monitoring Parameters Evening periods

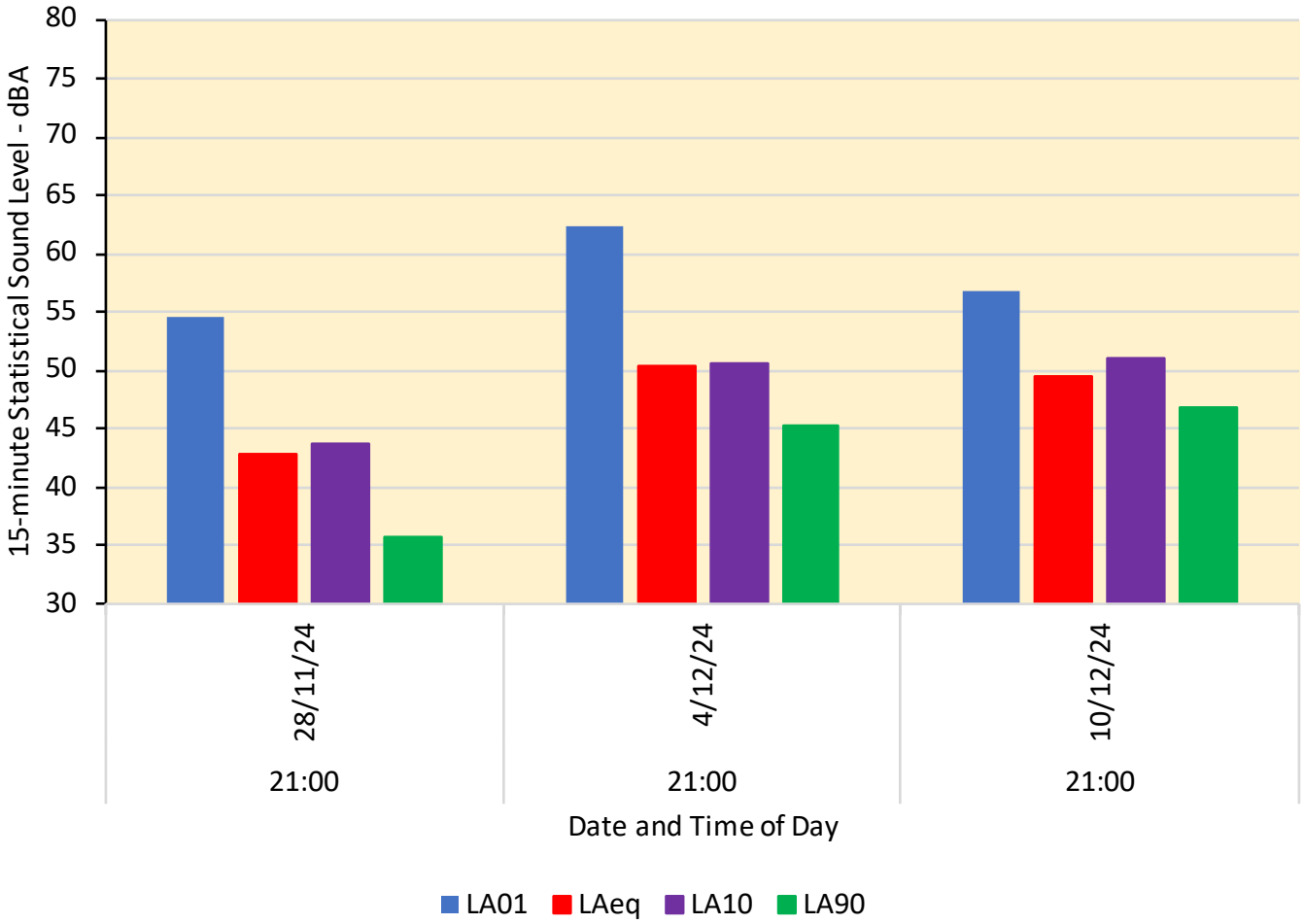

Figure 4.12: Boral cement Berrima Annual Environmental Noise - 4 Melbourne St Attended monitoring Parameters Daytime periods

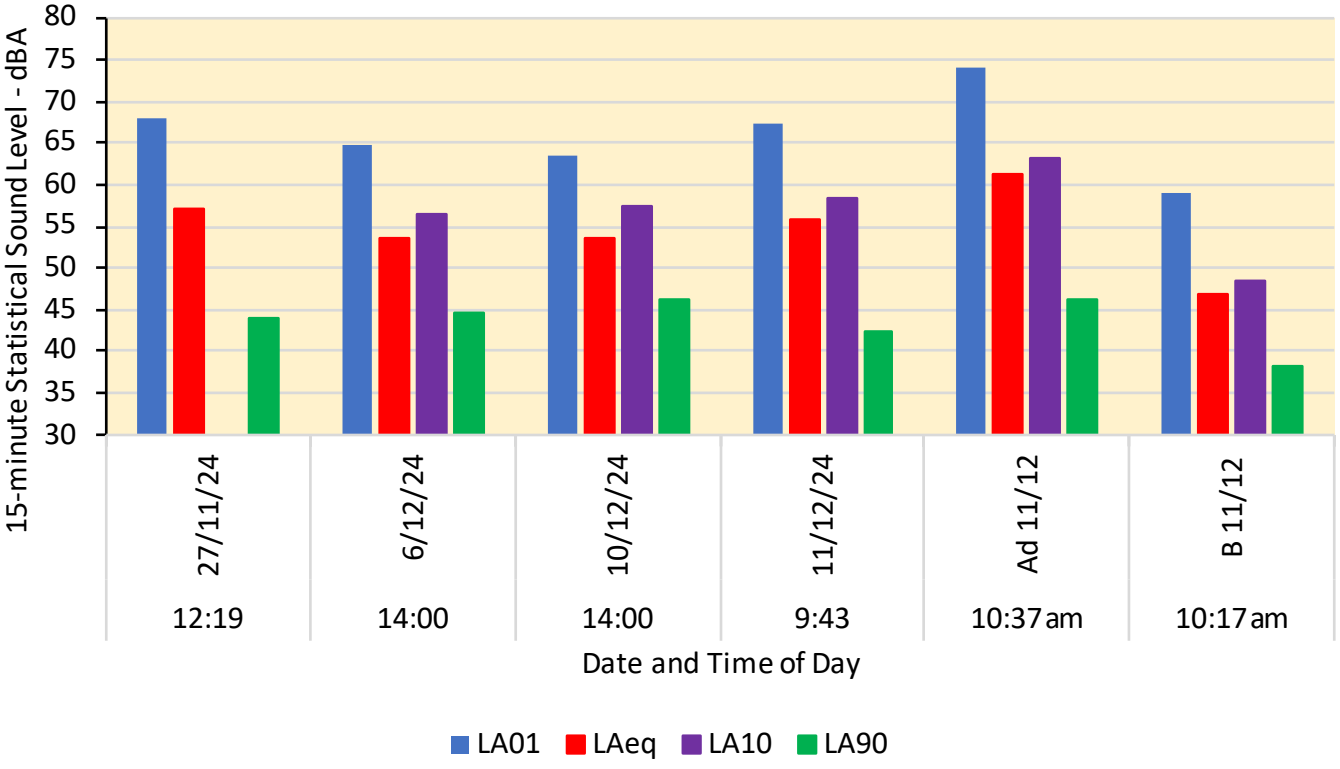

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Figure 4.13: Boral cement Berrima Annual Environmental Noise - North Fence Attended monitoring Parameters All periods

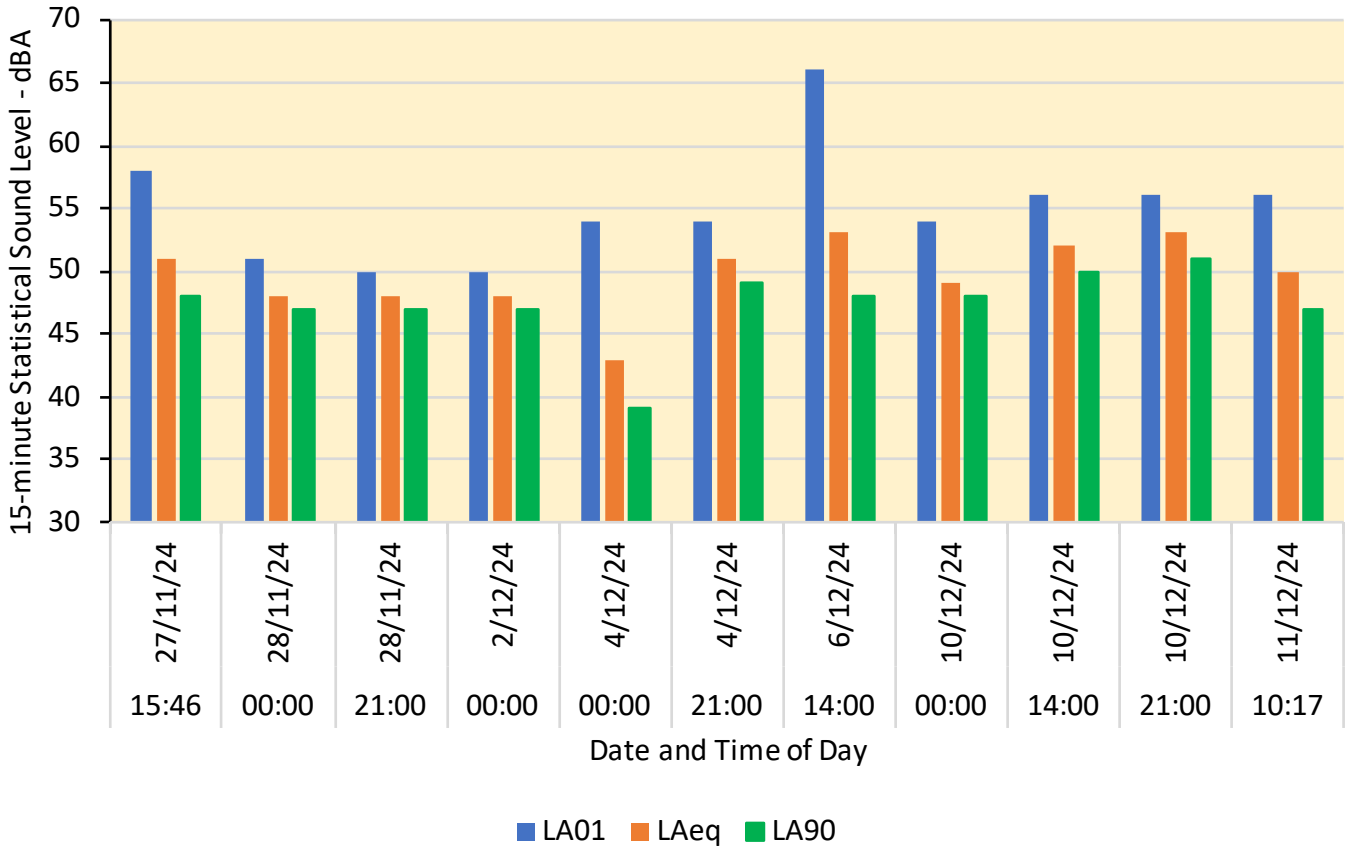

Figure 4.14: Boral cement Berrima Annual Environmental Noise - North Fence Attended monitoring Parameters Night-time periods

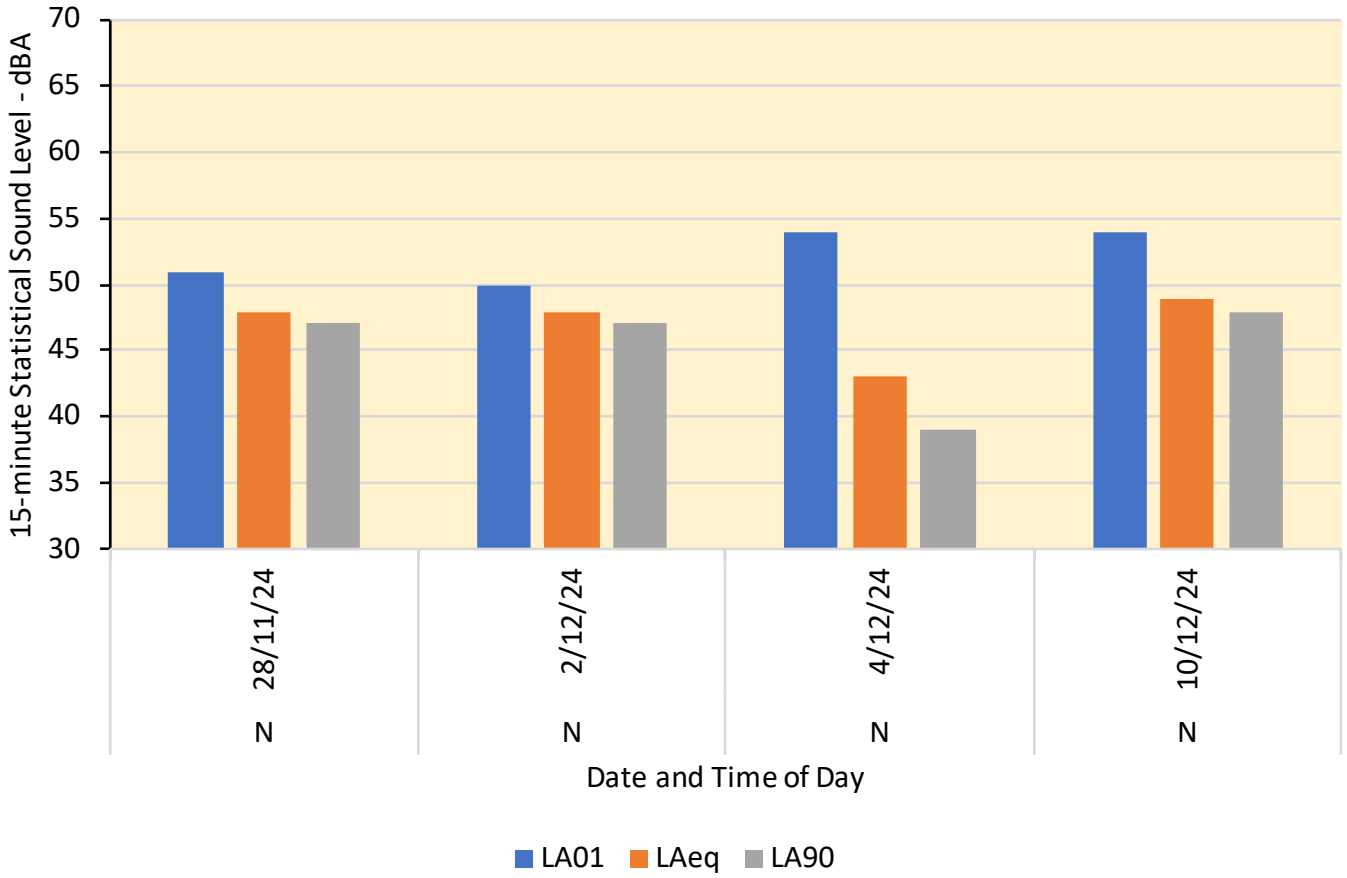

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Figure 4.15: Boral cement Berrima Annual Environmental Noise - North Fence Attended monitoring Parameters Evening periods

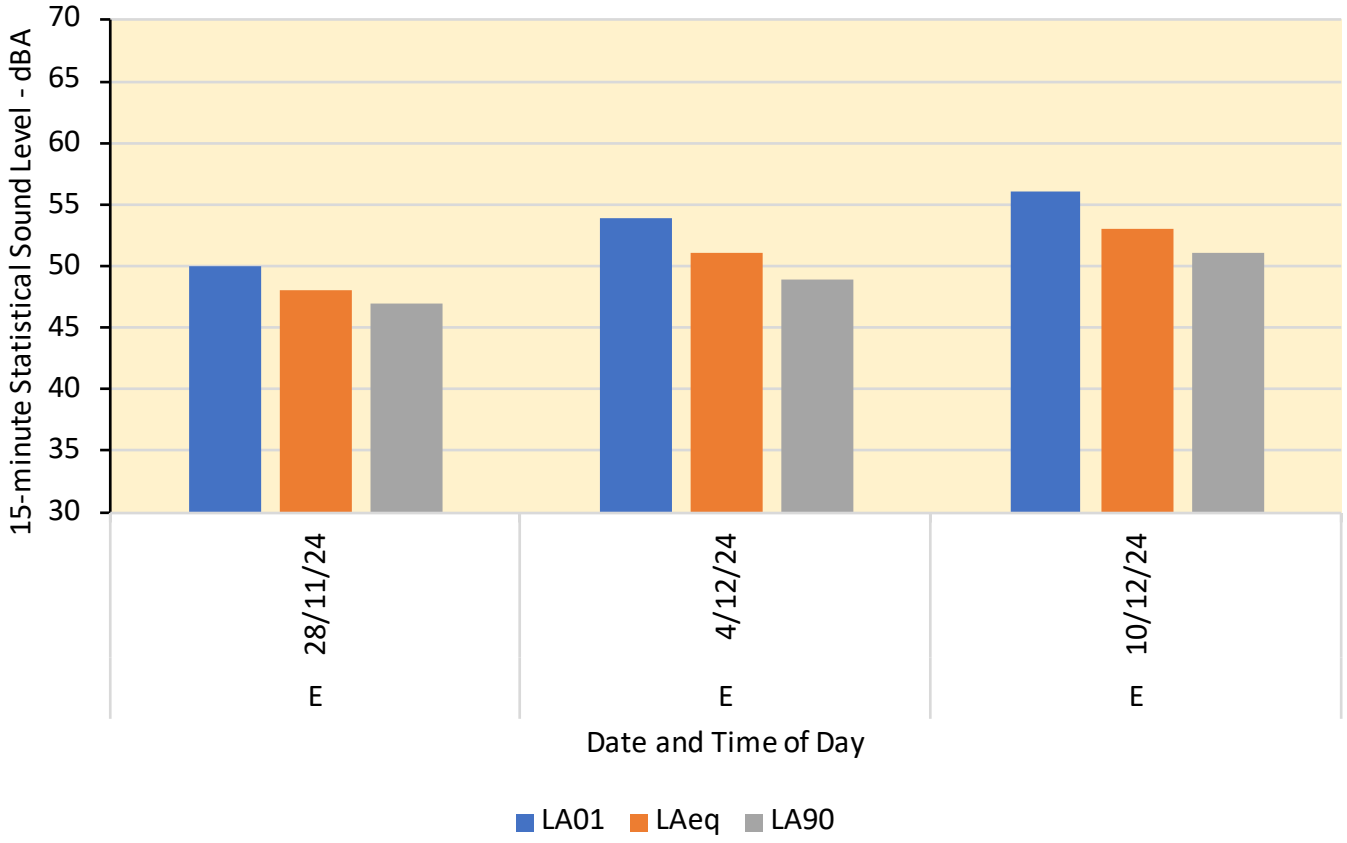

Figure 4.16: Boral cement Berrima Annual Environmental Noise - North Fence Attended monitoring Parameters Daytime periods

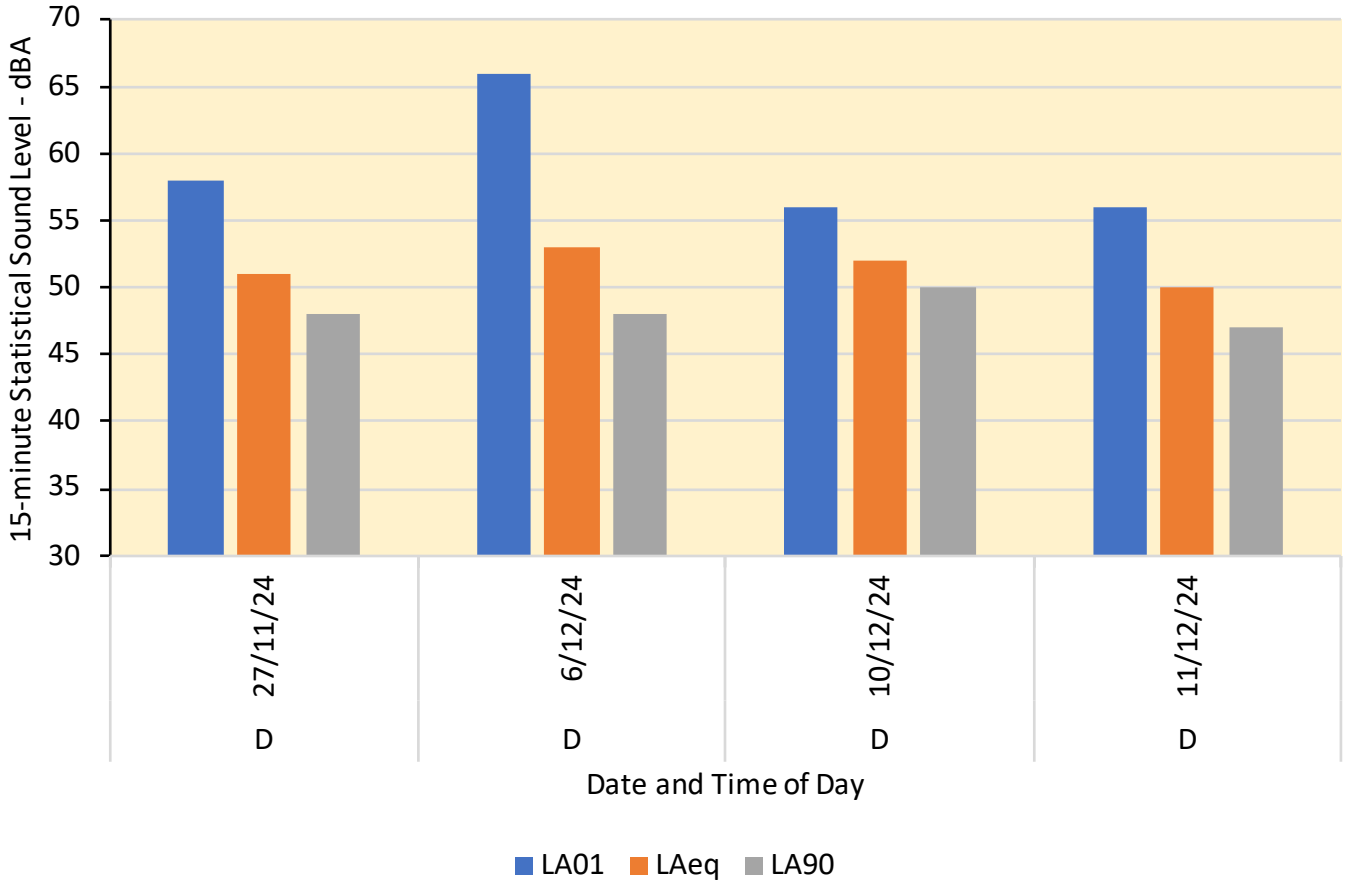

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Figure 4.17: Boral Cement Berrima Annual Environmental Noise 2024 - Comparison of 15-minute sound level parameters for attended monitoring at 4 Melbourne St and North Fence

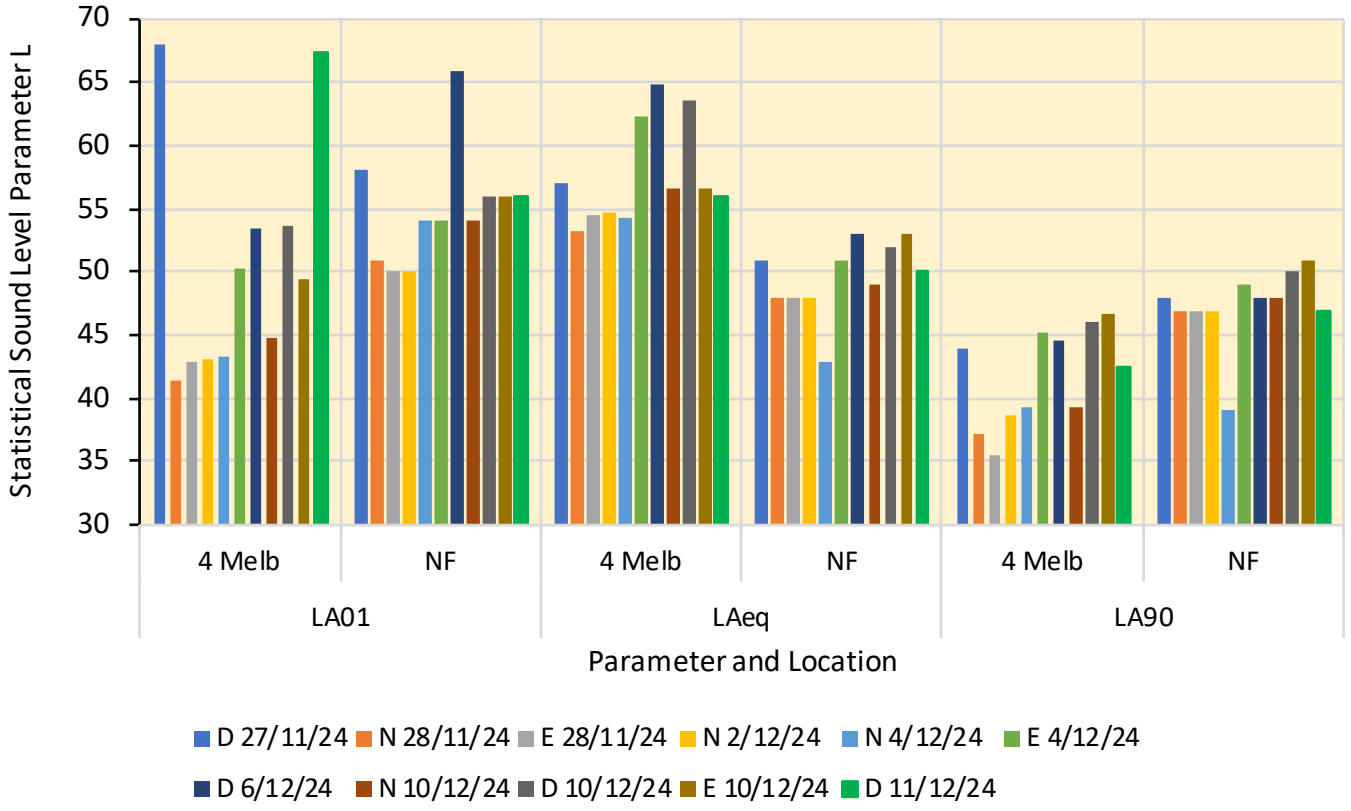
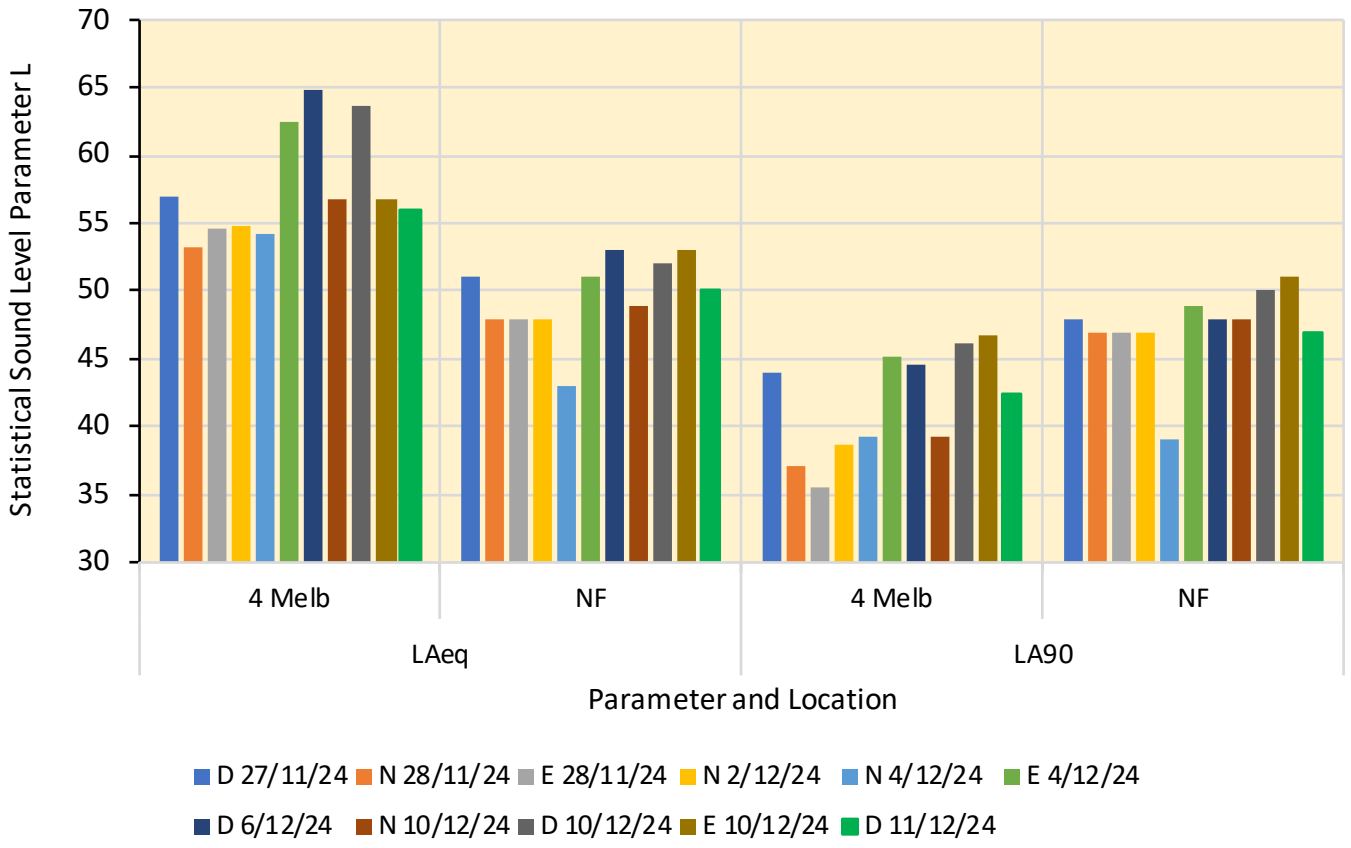


Figure 4.18: Boral Cement Berrima Annual Environmental Noise 2024 - Comparison of 15-minute sound level parameters for attended monitoring at 4 Melbourne St and North Fence



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5 Summary and Conclusions

The Boral Cement Berrima works has a single noise limit condition for the total site, of $L_{A90,15\text{-minute}}$ not to exceed 58 dBA at Location 20 in the Store Yard. Monitoring for total site emissions at Location 20 over a 15 day period from 27 November to 11 December 20254 has again confirmed that total site emissions are in compliance with the licence condition, as has occurred in all annual surveys since this condition was applied in 2019. Times when that sound level limit was exceeded at the site were caused by weather conditions and extraneous sources not relevant to the compliance assessment.

Sound levels at the plant and in the residential community affected by the noise emissions from the total site have been measured regularly since 2002 and since the completion of each of the Kiln 6 Upgrade and Cement Mill No.7 projects. Monitoring of both residential receiver sound levels and site source sound levels on an annual basis since 2008 has confirmed that both of the projects were in compliance with their noise limit conditions at the time and continue to achieve their objectives.

The annual environmental noise assessment has evaluated noise emission from the Cement Plant by the following methods:

- Monitoring of sound levels at Location 20 for compliance assessment over a two-week continuous period of plant operations;
- monitoring of sound levels in one residential receiver location with unattended monitoring over the same long-term period of two weeks;
- monitoring of sound levels in the North Fence location with unattended monitoring over the same period of two weeks to provide comparisons with the residential receiver and low-frequency and potential for sleep-disturbance at night-time as required by the NSW Noise Policy for Industry;
- attended monitoring in daytime at four residential receiver locations and two site locations to compare with long-term averages from previous years and assess the audible acceptability of the received sound levels;
- listening-attended monitoring from the unattended logger recordings at 4 Melbourne St and the North Fence location during four night periods, three evening periods and two daytime periods, to identify sources contributing to the received sound levels.

The finding of this 2024 annual environmental noise assessment is that total site noise emissions are considered to be in compliance with the licence condition. The licence condition was not exceeded at any time over the two-week monitoring period.

Sound levels from the two major completed projects (Kiln 6 Upgrade and Cement Mill No.7) are also considered to be in compliance with their noise objectives at the nearest residential receiver locations.

It is also the finding of this assessment that the long-term average statistical sound levels have not increased and indicates that the Cement Plant is not increasing its emissions.

Measurements at the North Fence boundary location also assessed potential sleep disturbance and low-frequency impacts according to the 2017 release of the Noise Policy for Industry.

Measurements of the Chloride Bypass Plant (completed in 2023) contribution to received sound levels at Location 20 and the other two locations were included as part of the long-term monitoring results during its operation at various times over the two-week period. Specific assessment of its source contribution emissions was done in 2023 and verified compliance.

Calculations of sleep disturbance potential use $\mathbf{L_{A01.1\text{-}minute} - L_{A90.15\text{-}minute}}$ at night-time to provide comparisons with recommended maximum values for night-time of 60 dBA for $\mathbf{L_{A01.1\text{-}minute}}$ night-time for the Northern Boundary location and not greater than 15 dB difference for $\mathbf{L_{A01.1\text{-}minute} - L_{A90.15\text{-}minute}}$. From the analyses it is considered that the number or times that the objectives of $\mathbf{L_{A01,1\text{-}minute}}$ greater than 60 dBA and $\mathbf{L_{A01.1\text{-}minute} - L_{A90.15\text{-}minute}}$ difference results greater than 15 dB are relatively low and the noise emissions from the Cement Plant have a low potential for sleep disturbance. Only warning signals from train horns, train operations and truck bumps were likely to cause the 60 dBA objective to be exceeded. While the analysis showed there were some 369 events where the objective was exceeded at the monitor, almost all of these were identified as being caused by birds in the early morning period. It is estimated that 95% of the sample had birds as the prominent source, 11% were trucks and 9% were trucks running over a bump in Taylor Ave. 6% of the events observed were impact noise from the Cement Works.

For low frequency assessment, an initial screening test is made of the C-weighted minus A-weighted (L_C-L_A) period sound level exceeding more than 15 dB. If the screening value is exceeded a one-third octave band frequency analyses is then made of un-weighted (or Z-weighted L_Z) sound levels in the low-frequency bands from 10 Hz to 160 Hz, compared to a specific value.

From the measurements in the residential receiver locations, the low frequency assessment was made on the $L_{Aeq,15\text{-}min}$ as per the Noise Policy for Industry. Exceedance of the screening test values were identified on five occasions out of eleven measurements for $L_{eq,15\text{-}min}$ at 4 Melbourne St, one of the two measurements from 12 Brisbane St. and none from the two measurements from Adelaide St.

Of the five detailed assessments of evening and night-time measurements at 4 Melbourne St, four had minor exceedances of the objectives (less than 2 dB), one of these was marginal (less than 0.5 dB) in the 50Hz band. These minor exceedances in the 50 Hz band could be explained to electrical items that were running locally. Comparing to the 2023 LFN assessment, where 4 Melbourne St observed higher levels of low frequency sound between the 40 Hz to 80 Hz and the 160 Hz bands, this 2024 assessment had a significant reduction in sound levels in those bands. The only sound levels observed above that of the objective for residential receiver locations were in the 50 Hz band and 160 Hz band. This indicates that there is less low frequency noise observed in this survey compared to the 2023 Survey.

From the assessment of this survey it is considered that the main source of low-frequency noise events exceeding the policy objectives is from road traffic noise associated with trucks, either from within New Berrima or on distant roads and the freeway. The plant can be a source at times but this is not considered to be significant. Exceedances of the objectives by the L_{90} spectrum levels are considered to be minor.

Site noise sources

Sound levels are measured in 11 areas at locations near major plant items and the near edges of the main plant each year to compare with those of previous years. Some increases were identified in three main areas and these were mostly considered to be related to normal variability in operations. A

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higher sound level near the doorway of RM6 may be related to recent maintenance or unusual conditions and are not expected to cause increased sound levels at residential receivers.

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Appendices

Appendix A: One-third octave band frequency spectra of measurements and tonality graphs

Appendix B: Unattended environmental sound level results for 4 Melbourne Street

Appendix C: Unattended environmental sound level results for Northern Boundary

Appendix D: Unattended environmental sound level results for Compliance Monitoring Location 20 - Store Yard Close

Appendix E: Narrow-band spectra from attended measurement recordings

Appendix F: Attended monitoring results

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Appendix A: One-third octave band frequency spectra of measurements and tonality graphs

Table A1: Boral Cement Berrima Annual Environmental Noise 2024 - One-third Octave Band Spectra and Tonality Assessment

One-third Octave Band Spectra and Tonality Assessment for LAEq

Loc	Condition	Location	MeasureDateTir	Oct_ID	Type	LAeq Band Sound Level in One-third Octave Band Centrte Frequency - dB																													
						25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
1	Day 27/1	4 Melbourne	27/11/24 12:19	2577	Leq	16	20	25	30	33	44	37	38	41	42	42	43	44	45	46	47	48	47	46	44	43	41	39	37	34	31	29	24	14	7
1	Night 28/	4 Melbourne	28/11/24 0:00	2644	Leq	15	11	15	21	19	19	16	19	26	29	26	27	29	32	32	34	33	32	30	26	24	19	15	13	12	10	8	6	3	-3
1	Evening	4 Melbourne	28/11/24 21:00	2648	Leq	16	10	13	19	20	19	19	20	26	26	27	26	29	32	33	36	37	34	31	27	24	19	14	12	11	10	9	11	3	-3
1	Night 2/1	4 Melbourne	2/12/24 0:00	2645	Leq	17	11	18	22	20	23	21	24	29	33	29	28	31	32	33	35	36	33	30	26	22	18	13	11	10	9	8	6	3	-3
1	Evening	4 Melbourne	4/12/24 21:00	2649	Leq	20	17	21	27	28	31	27	30	35	37	36	36	38	40	40	41	42	41	40	37	34	30	25	21	18	14	11	7	3	-3
1	Day 6/12	4 Melbourne	6/12/24 14:00	2652	Leq	15	20	27	31	34	38	36	36	40	39	40	40	40	42	43	45	45	44	43	40	38	34	31	26	22	20	16	12	5	-1
1	Night 4/1	4 Melbourne	4/12/24 0:00	2646	Leq	17	16	17	22	22	24	20	20	30	35	29	29	32	33	34	35	35	33	30	27	24	19	15	13	12	10	8	6	3	-3
1	Night 10/	4 Melbourne	10/12/24 0:00	2647	Leq	14	12	18	20	21	20	19	23	35	38	31	29	30	32	34	35	36	34	32	28	25	21	17	15	13	10	8	11	4	-3
1	Day 10/1	4 Melbourne	10/12/24 14:00	2651	Leq	18	22	24	30	32	34	30	34	38	41	41	41	41	43	44	44	45	45	43	40	37	33	30	27	22	18	15	9	4	4
1	Evening	4 Melbourne	10/12/24 21:00	2650	Leq	17	18	23	26	26	25	24	25	34	37	34	37	40	40	39	40	41	40	38	35	32	27	24	20	19	15	11	9	4	-2
1	Day 11/1	4 Melbourne	11/12/24 8:43	2606	Leq	16	21	26	28	33	40	38	42	47	42	41	43	44	44	45	46	46	45	43	42	40	39	39	36	33	32	30	21	10	3
2	Day	Brisbane St	27/11/24 12:39	2578	Leq	21	21	22	31	34	33	35	37	37	37	39	41	42	42	47	46	47	49	45	44	42	40	40	36	32	29	25	21	15	8
2	Day	Brisbane St	11/12/24 10:17	2594	Leq	16	15	20	25	27	26	30	30	32	34	33	36	34	34	35	36	38	36	34	32	32	34	34	29	24	22	19	13	6	1
3	Day	Adelaide St	27/11/24 12:59	2579	Leq	22	25	29	32	44	52	43	49	55	50	50	53	54	52	54	54	54	53	52	51	50	49	48	45	43	40	38	32	27	21
3	Day	Adelaide St	11/12/24 10:37	2590	Leq	19	24	27	32	37	44	39	42	51	52	48	48	49	49	50	51	51	51	49	48	47	45	44	43	40	37	35	31	20	10
4	Day	North Fence	27/11/24 15:46	2581	Leq	16	22	23	27	32	33	31	32	32	33	33	36	38	40	41	42	42	42	41	40	38	36	36	34	35	31	29	25	21	13
4	Night	North Fence	28/11/24 0:00	2568	Leq	27	20	22	25	27	28	29	27	27	32	36	37	39	41	39	38	38	37	34	32	30	26	20	16	11	8	12	10	3	-2
4	Evening	North Fence	28/11/24 21:00	2572	Leq	27	19	17	23	25	27	26	24	26	26	30	35	39	43	39	39	37	34	32	30	27	23	18	15	12	9	8	18	20	11
4	Night	North Fence	2/12/24 0:00	2569	Leq	27	18	22	26	28	30	30	26	28	33	36	36	39	42	40	39	37	35	33	31	29	26	21	17	15	14	9	10	13	10
4	Night	North Fence	4/12/24 0:00	2570	Leq	27	22	22	25	27	29	28	27	29	34	36	37	37	38	38	37	37	37	34	34	32	29	25	19	14	10	7	19	23	14
4	Evening	North Fence	4/12/24 21:00	2573	Leq	27	19	20	25	27	29	29	27	29	34	37	40	42	45	42	41	41	40	38	37	36	33	28	21	13	9	6	3	5	5
4	Day	North Fence	6/12/24 14:00	2576	Leq	14	19	23	26	30	33	35	33	34	34	36	38	39	42	40	38	38	38	39	39	48	45	35	36	29	29	28	25	28	26
4	Night	North Fence	10/12/24 0:00	2571	Leq	25	19	23	23	24	27	28	25	32	37	36	37	39	41	40	40	38	37	34	32	30	26	22	16	10	8	5	2	0	-2
4	Day	North Fence	10/12/24 14:00	2575	Leq	27	20	24	27	32	34	33	34	36	38	38	41	43	45	42	41	41	41	39	37	35	32	29	24	21	25	23	15	19	24
4	Evening	North Fence	10/12/24 21:00	2574	Leq	27	20	22	25	28	31	30	27	34	39	39	42	43	46	43	42	42	42	40	38	36	33	28	21	16	14	10	6	3	-1
4	Day	North Fence	11/12/24 10:17	2582	Leq	26	21	26	29	32	34	35	36	37	40	33	35	40	40	39	39	40	40	38	36	34	32	32	32	30	30	30	25	25	26
5	Day	Location 20	27/11/24 15:23	2580	Leq	17	22	26	30	32	35	37	39	43	44	42	43	45	47	45	45	46	46	44	42	41	39	36	33	30	28	26	23	18	12
5	Day	Loc 20	11/12/24 11:15	2583	Leq	27	23	26	30	32	39	39	40	44	47	42	41	45	47	46	46	47	48	45	45	43	42	40	37	32	28	25	21	15	9

						Tonality in LAeq Band Sound Level in One-third Octave Band Centrte Frequency - dB																															
						25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
	Tonality Objective		Tonality Objecti	Tonality Obj		15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1	Day 27/1	4 Melbourne	27/11/24 12:19	2568	Leq		0.8	0.15	0.55	3.7	9.05	4.2	0.7	0.95	0.35	0.7	0.3	0.2	0.4	0.05	0.45	0.6	0.1	0.15	0.05	0.2	0.1	0.25	0.25	0.05	0.1	1.25	2.25	1.4	
1	Night 28/	4 Melbourne	28/11/24 0:00	2569	Leq		3.9	0.8	3.8	1.2	1.5	2.7	2.3	1.9	3.4	2.4	0.5	0.2	1.4	0.9	0.9	0.7	0.2	0.8	0.6	1.1	0.1	1.2	0.3	0.2	0.1	0.3	0.4	1.3	
1	Evening	4 Melbourne	28/11/24 21:00	2571	Leq		4.5	1.5	2.6	0.7	0.0	0.8	2.8	3.3	0.4	0.6	1.6	0.4	1.3	0.9	0.7	2.0	0.1	0.5	0.3	0.6	0.2	1.0	0.6	0.1	0.6	1.1	5.1	1.1	
1	Night 2/1	4 Melbourne	2/12/24 0:00	2572	Leq		6.5	1.6	2.7	1.8	2.1	2.6	1.3	1.3	3.6	1.7	1.8	0.9	0.2	0.8	0.8	2.0	0.1	0.5	0.3	0.5	0.0	1.2	0.5	0.0	0.2	0.2	0.6	1.3	
1	Evening	4 Melbourne	4/12/24 21:00	2573	Leq		3.7	0.7	2.2	0.6	3.1	3.0	1.6	1.8	1.5	0.3	1.1	0.1	0.5	0.2	0.1	0.9	0.3	0.5	0.2	0.7	0.2	0.4	0.8	0.7	0.6	0.8	0.3	1.0	
1	Day 6/12	4 Melbourne	6/12/24 14:00	2574	Leq		1.0	1.6	0.4	0.5	3.2	1.0	2.4	2.7	0.7	0.2	0.0	1.1	0.7	0.3	0.4	0.8	0.2	0.9	0.3	0.5	0.1	0.9	0.8	0.6	0.7	0.3	1.2	0.2	
1	Night 4/1	4 Melbourne	10/12/24 0:00	2575	Leq		1.7	1.6	2.7	1.1	2.6	1.7	4.9	2.7	5.2	2.9	1.8	1.6	0.5	0.2	1.2	0.7	0.3	0.2	0.1	0.9	0.1	1.5	0.1	0.2	0.1	0.2	0.5	1.3	
1	Night 10/	4 Melbourne	10/12/24 0:00	2576	Leq		4.1	2.1	0.4	1.3	0.2	2.3	4.5	4.5	5.7	3.3	1.2	0.3	0.1	0.3	0.1	1.7	0.2	0.9	0.3	0.8	0.4	0.7	0.4	0.6	0.4	2.1	4.5	0.2	
1	Day 10/1	4 Melbourne	10/12/24 14:00	2577	Leq		0.6	1.8	2.0	0.0	3.2	4.2	0.1	0.4	1.9	0.4	0.0	0.6	0.2	0.1	0.1	0.9	0.5	0.5	0.1	0.7	0.8	0.3	1.2	1.0	0.0	0.9	0.1	2.7	
1	Evening	4 Melbourne	10/12/24 21:00	2578	Leq		1.7	1.1	1.1	0.7	0.2	1.1	4.6	3.4	3.2	3.1	0.1	1.1	0.8	0.7	0.5	1.3	0.3	0.6	0.1	1.0	0.7	0.2	0.7	0.8	0.2	0.8	1.6	0.6	
1	Day 11/1	4 Melbourne	11/12/24 8:43	2579	Leq		0.3	1.0	0.8	1.4	4.5	3.1	0.3	4.8	1.6	1.8	0.8	0.4	0.7	0.4	0.3	0.4	0.4	0.3	0.5	0.2	0.6	1.3	0.3	1.5	0.8	4.0	0.1	1.2	
2	Day	12 Brisbane S	27/11/24 12:39	2580	Leq		0.7	3.7	2.8	2.2	1.9	0.6	0.6	0.3	0.3	0.5	0.8	0.1	1.8	2.3	0.4	1.0	3.5	2.1	1.1	0.5	0.5	1.4	0.4	0.6	0.6	0.1	1.0	0.6	
2	Day	12 Brisbane S	11/12/24 10:17	2581	Leq		3.0	0.6	0.6	2.2	2.6	1.6	0.6	0.1	1.6	2.0	2.4	0.7	0.7	0.4	0.0	1.8	0.1	0.2	1.4	0.4	0.5	2.8	0.1	1.7	0.7	1.5	0.2	0.9	
3	Day	Adelaide St 2	27/11/24 12:59	2582	Leq		0.5	0.9	4.6	1.9	8.5	7.4	0.2	5.8	2.4	2.1	1.5	1.6	2.3	0.9	0.3	0.3	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.4	0.3	1.4	0.3	0.2	
3	Day	Adelaide St 2	11/12/24 10:37	2583	Leq		0.2	0.4	0.4	1.0	6.3	4.5	2.7	4.2	2.3	2.1	0.6	0.4	0.3	0.0	0.5	0.3	0.5	0.0	0.4	0.1	0.1	0.3	0.8	0.2	0.4	1.4	3.1	0.2	
4	Day	North Fence	27/11/24 15:46	2590	Leq		2.5	1.5	0.2	1.8	1.3	0.9	0.4	0.7	0.6	1.6	0.5	0.2	0.4	0.2	0.1	0.5	0.1	0.3	0.4	0.3	0.4	0.4	1.0	2.2	1.0	1.1	0.1	2.0	
4	Night	North Fence	28/11/24 0:00	2594	Leq		4.7	0.4	0.1	0.9	0.4	2.1	1.4	2.6	1.1	1.1	0.4	0.3	2.3	0.9	0.1	0.1	1.3	0.7	0.4	0.9	0.6	0.4	0.1	1.4	2.9	2.8	2.4	0.7	
4	Evening	North Fence	28/11/24 21:00	2606	Leq		2.9	3.8	1.6	0.3	1.0	1.1	2.1	0.9	2.3	0.4	0.8	0.0	3.4	1.6	1.0	0.6	0.3	0.4	0.5	0.5	0.8	0.9	0.4	0.2	0.5	6.0	4.3	5.5	
4	Night	North Fence	2/12/24 0:00	2644	Leq		6.3	0.1	0.7	0.4	1.0	2.1	3.3	1.3	0.8	1.3	0.8	0.5	2.9	0.5	0.1	0.5	0.4	0.3	0.3	0.8	1.2	0.6	1.1	0.6	2.1	3.4	0.3	2.5	
4	Night	North Fence	4/12/24 0:00	2645	Leq		2.9	1.1	0.1	0.8	0.8	0.4	1.4	2.0	1.9	0.2	0.8	0.7	0.7	0.1	0.2	0.5	1.6	1.2	0.5	0.9	0.6	0.6	0.1	1.2	0.4	7.1	3.5	6.9	
4	Evening	North Fence	4/12/24 21:00	2646	Leq		5.0	1.6	1.5	0.3	0.9	1.3	2.3	1.2	0.6	0.5	0.3	0.6	3.2	1.0	0.4	0.2	0.6	0.5	0.2	1.1	0.6	1.4	0.4	2.3	0.0	0.3	2.5	0.9	
4	Day	North Fence	6/12/24 14:00	2646	Leq		0.5	0.9	0.9	0.5	0.5	2.2	1.4	0.4	1.1	0.3	0.3	1.1	2.9	0.5	0.8	0.3	0.9	0.9	5.1	6.4	3.7	6.0	4.3	3.6	0.5	1.4	3.7	3.2	
4	Night	North Fence	10/12/24 0:00	2647	Leq		5.0	1.7	0.1	1.5	1.1	2.1	5.1	1.0	3.1	0.8	0.5	0.5	2.1	0.8	0.8	0.3	1.0	0.4	0.1	0.8	0.1	1.3	0.5	1.8	0.6	0.0	0.6	0.3	
4	Day	North Fence	10/12/24 14:00	2648	Leq		5.7	0.7	1.4	1.7	2.0	1.4	0.8	0.3	0.9	1.4	0.7	0.5	2.6	1.0	0.4	0.3	0.2	0.5	0.2	0.8	0.3	1.6	1.6	3.1	2.9	2.8	6.0	0.1	
4	Evening	North Fence	10/12/24 21:00	2649	Leq		4.2	0.4	0.5	0.7	1.4	1.1	4.4	0.2	3.0	1.5	0.5	0.4	2.6	0.7	0.8	0.3	0.9	0.0	0.2	0.7	0.5	1.1	0.7	1.4	0.6	0.0	0.3	0.2	
4	Day	North Fence	11/12/24 10:17	2650	Leq		4.4	0.8	0.5	1.3	0.0	0.1	0.0	1.3	5.2	4.2	1.8	2.7	0.5	0.6	0.6	1.0	0.5	0.1	0.0	0.4	0.6	0.1	0.6	0.6	0.3	2.6	2.3	0.7	
5	Day	Location 20	27/11/24 15:23	2651	Leq		0.5	0.4	1.2	0.4	0.5	0.0	0.9	1.1	1.8	1.6	0.6	0.4	1.7	1.3	0.1	0.2	1.7	0.5	0.1	0.3	0.4	0.3	0.1	0.9	0.4	0.8	0.8	0.3	
5	Day	Loc 20	11/12/24 11:15	2652	Leq		4.1	0.2	0.8	2.0	2.8	0.3	2.3	1.1	4.2	2.3	2.3	0.5	2.0	0.7	0.6	0.3	1.8	1.1	0.5	0.3	0.6	0.5	0.6	0.1	0.4	0.5	0.6	0.4	

NOTE: Pink Shading indicates Tonality objective is exceeded

Table A2: Boral Cement Berrima Annual Environmental Noise 2024 - One-third Octave Band Spectra and Tonality Assessment

One-third Octave Band Spectra and Tonality Assessment for LA90

Loc	Condition	Location	MeasureDateTir	Oct_ID		LA90 Band Sound Level in One-third Octave Band Centrte Frequency - dB																													
					Type	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
1	Day 27/1	4 Melbourne	27/11/24 12:19	2577	L90	11	10	14	18	21	23	26	26	28	29	27	30	31	31	32	32	32	33	30	29	29	28	27	24	21	22	22	14	6	2
1	Night 28/	4 Melbourne	28/11/24 0:00	2644	L90	13	6	11	15	15	13	11	15	22	25	22	24	26	28	26	27	27	26	23	19	16	12	10	9	9	9	8	6	3	-3
1	Evening	4 Melbourne	28/11/24 21:00	2648	L90	14	4	8	13	14	14	14	15	19	21	20	21	24	27	26	27	25	24	22	19	15	11	10	9	9	9	8	6	3	-3
1	Night 2/1	4 Melbourne	2/12/24 0:00	2645	L90	15	7	13	17	17	18	17	20	26	29	24	25	27	28	28	29	28	25	23	20	18	13	10	9	9	9	8	6	3	-3
1	Evening	4 Melbourne	4/12/24 21:00	2649	L90	18	12	16	21	21	21	20	21	30	32	29	32	33	34	34	36	36	35	34	31	29	23	16	11	10	9	8	6	3	-3
1	Day 6/12	4 Melbourne	6/12/24 14:00	2652	L90	6	11	18	22	24	23	22	22	34	33	29	30	32	33	33	34	34	34	32	29	26	23	20	16	12	12	10	7	4	-2
1	Night 4/1	4 Melbourne	4/12/24 0:00	2646	L90	15	11	12	17	18	18	16	17	27	31	24	25	27	28	27	29	28	27	24	21	19	14	10	10	9	9	8	6	3	-3
1	Night 10/	4 Melbourne	10/12/24 0:00	2647	L90	8	8	13	16	16	15	14	17	31	35	23	23	24	24	24	25	26	24	22	18	16	12	10	9	9	9	8	6	3	-3
1	Day 10/1	4 Melbourne	10/12/24 14:00	2651	L90	13	14	18	22	23	23	22	23	32	34	32	34	35	35	35	35	36	35	33	30	27	23	19	15	12	10	9	6	4	-2
1	Evening	4 Melbourne	10/12/24 21:00	2650	L90	10	11	18	21	22	22	20	21	31	33	31	34	37	37	36	36	37	36	34	32	29	23	17	13	11	10	8	6	3	-3
1	Day 11/1	4 Melbourne	11/12/24 8:43	2606	L90	9	11	17	18	19	23	26	26	31	31	24	26	28	27	27	27	28	28	25	24	23	25	25	22	22	23	20	11	4	0
2	Day	Brisbane St	27/11/24 12:39	2578	L90	18	11	11	14	18	20	22	25	27	27	26	28	29	30	32	33	31	31	29	27	26	26	26	23	18	16	13	7	3	1
2	Day	Brisbane St	11/12/24 10:17	2594	L90	13	9	15	15	18	18	20	21	24	26	21	22	23	23	24	24	24	24	22	21	21	22	22	18	14	17	14	7	3	-1
3	Day	Adelaide St	27/11/24 12:59	2579	L90	8	14	16	20	23	25	28	31	35	34	31	34	35	35	36	38	38	38	36	34	32	31	29	27	26	28	29	22	17	16
3	Day	Adelaide St	11/12/24 10:37	2590	L90	13	15	17	21	22	24	27	30	38	37	30	31	32	31	30	31	32	32	30	28	26	24	22	20	17	17	12	6	4	0
4	Day	North Fence	27/11/24 15:46	2581	L90	11	16	18	22	25	27	27	28	28	28	29	32	35	37	38	39	39	38	36	34	31	29	25	21	18	18	15	9	5	1
4	Night	North Fence	28/11/24 0:00	2568	L90	26	16	18	20	21	24	24	23	25	30	34	35	37	39	37	36	35	35	32	30	27	23	18	12	10	9	7	6	3	1
4	Evening	North Fence	28/11/24 21:00	2572	L90	26	14	12	18	21	23	23	21	21	23	28	34	37	40	38	38	36	33	30	28	25	21	16	11	10	9	7	15	17	9
4	Night	North Fence	2/12/24 0:00	2569	L90	25	14	18	21	21	25	26	23	26	30	33	35	37	40	38	36	36	33	32	30	28	25	19	13	10	9	7	6	10	9
4	Night	North Fence	4/12/24 0:00	2570	L90	25	16	17	20	24	25	26	24	26	31	33	35	35	36	36	36	35	35	33	32	30	27	23	17	11	9	7	13	16	6
4	Evening	North Fence	4/12/24 21:00	2573	L90	25	14	16	21	23	26	26	24	26	31	35	38	39	42	40	39	39	38	36	35	33	30	26	18	11	9	7	6	4	4
4	Day	North Fence	6/12/24 14:00	2576	L90	9	15	19	21	23	25	27	25	30	30	33	35	36	39	36	36	35	36	33	32	33	29	25	22	19	25	25	21	24	24
4	Night	North Fence	10/12/24 0:00	2571	L90	24	15	19	20	21	24	26	23	30	35	34	35	37	39	37	37	37	35	33	30	28	24	19	13	10	9	7	6	3	1
4	Day	North Fence	10/12/24 14:00	2575	L90	25	15	19	22	26	27	28	26	30	34	35	39	40	42	40	40	39	38	37	35	33	29	25	19	16	16	12	10	17	21
4	Evening	North Fence	10/12/24 21:00	2574	L90	25	16	18	20	24	26	26	24	30	35	36	39	41	43	41	40	41	40	38	36	34	30	26	19	13	10	7	6	3	1
4	Day	North Fence	11/12/24 10:17	2582	L90	24	17	21	23	26	27	30	30	32	35	29	30	35	36	35	35	36	36	33	31	29	27	23	19	18	22	21	17	21	24
5	Day	Location 20	27/11/24 15:23	2580	L90	11	16	20	25	28	31	34	35	38	40	38	39	41	43	42	43	43	43	40	38	36	34	30	24	17	11	8	6	3	1
5	Day	Loc 20	11/12/24 11:15	2583	L90	25	17	21	26	28	31	35	36	41	44	37	37	39	43	42	42	43	42	39	38	36	33	29	22	15	12	8	6	3	1

						Tonality in LA90 Band Sound Level in One-third Octave Band Centrte Frequency - dB																															
						25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
	Tonality Objective		Tonality Objecti	Tonality	Type	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1	Day 27/1	4 Melbourne	27/11/24 12:19	2568	L90		2.4	0.35	0.9	0.05	0.1	1.15	0.5	0.1	1.9	2.85	1	0.65	0.6	0.4	0.15	0.2	1.4	0.7	0.05	0.1	0.2	0.9	0.15	2.4	1	3.85	0.2	1.75	
1	Night 28/	4 Melbourne	28/11/24 0:00	2569	L90		5.5	0.0	2.7	0.2	0.4	2.8	1.8	1.8	3.6	2.8	0.1	0.2	1.6	1.0	0.5	0.0	1.6	0.0	0.1	0.2	1.1	0.8	0.1	0.2	0.3	0.3	0.7	1.2	
1	Evening	4 Melbourne	28/11/24 21:00	2571	L90		6.6	1.0	2.3	0.7	0.2	0.3	2.1	1.8	1.0	1.0	0.7	0.2	2.0	0.8	0.9	0.3	0.2	0.6	0.2	0.1	0.8	0.8	0.1	0.2	0.3	0.3	0.6	1.4	
1	Night 2/1	4 Melbourne	2/12/24 0:00	2572	L90		7.5	1.3	2.3	0.9	1.3	2.5	0.9	1.3	3.7	2.6	0.8	0.6	0.3	0.6	1.3	0.7	0.1	0.1	0.1	0.8	0.3	1.5	0.1	0.1	0.3	0.3	0.7	1.2	
1	Evening	4 Melbourne	4/12/24 21:00	2573	L90		4.2	1.3	3.0	0.4	0.6	0.9	3.8	3.1	2.6	2.5	0.3	0.4	0.3	0.6	0.4	0.6	0.6	0.2	0.2	1.6	0.6	1.1	1.7	0.2	0.2	0.3	0.6	1.3	
1	Day 6/12	4 Melbourne	6/12/24 14:00	2574	L90		0.8	1.1	1.5	1.0	0.0	0.2	6.0	6.6	1.4	2.8	0.0	0.5	0.4	0.6	0.3	0.6	0.4	0.7	0.1	0.1	0.2	0.9	0.5	1.5	0.7	0.6	0.3	1.6	
1	Night 4/1	4 Melbourne	10/12/24 0:00	2575	L90		2.9	1.5	1.9	0.6	0.7	1.5	4.3	2.8	5.5	3.9	0.6	0.9	0.3	1.1	1.6	0.1	1.0	0.4	0.0	1.2	0.3	1.6	0.3	0.1	0.3	0.3	0.6	1.4	
1	Night 10/	4 Melbourne	10/12/24 0:00	2576	L90		3.2	1.3	1.4	0.3	0.2	1.9	5.9	5.6	7.6	6.0	0.9	0.8	0.4	0.9	0.1	1.2	0.7	0.2	0.3	0.7	0.8	1.1	0.0	0.2	0.3	0.3	0.7	1.3	
1	Day 10/1	4 Melbourne	10/12/24 14:00	2577	L90		1.8	0.2	1.5	0.6	0.3	0.8	4.2	3.4	2.3	1.9	0.0	0.8	0.1	0.6	0.0	1.1	0.3	0.7	0.1	0.3	0.0	0.5	0.8	0.8	0.2	0.3	0.3	1.1	
1	Evening	4 Melbourne	10/12/24 21:00	2578	L90		2.6	1.7	1.2	0.5	0.8	1.5	4.3	3.8	2.6	3.0	0.2	1.3	0.4	0.4	0.5	1.0	0.6	0.2	0.2	1.5	0.1	0.9	1.2	0.1	0.1	0.3	0.5	1.3	
1	Day 11/1	4 Melbourne	11/12/24 8:43	2579	L90		1.5	2.3	0.4	0.8	0.0	1.7	2.7	2.6	3.6	4.3	0.1	1.2	0.2	0.5	0.0	0.6	1.1	0.5	0.5	1.2	1.1	1.1	0.9	1.3	2.8	2.6	0.9	1.3	
2	Day	12 Brisbane S	27/11/24 12:39	2580	L90		3.5	1.2	0.7	1.1	0.4	1.1	0.9	0.5	0.9	1.6	0.8	0.2	0.6	0.5	1.3	0.6	1.3	0.5	0.3	0.8	0.5	1.4	0.7	1.5	0.9	1.3	1.3	0.8	
2	Day	12 Brisbane S	11/12/24 10:17	2581	L90		4.6	2.6	1.1	0.9	0.7	0.9	1.7	0.6	4.0	3.4	0.0	0.4	0.1	0.3	0.3	0.3	0.6	0.4	0.4	0.7	0.9	1.6	0.0	3.1	2.5	2.1	1.5	0.1	
3	Day	Adelaide St 2	27/11/24 12:59	2582	L90		2.6	1.4	0.6	0.3	0.1	0.4	0.1	2.3	1.2	3.1	1.3	0.2	0.9	0.1	0.6	0.3	0.7	0.3	0.3	0.2	0.3	0.1	0.6	1.7	0.8	4.2	1.4	2.1	
3	Day	Adelaide St 2	11/12/24 10:37	2583	L90		0.4	0.8	1.4	0.9	0.2	0.1	2.3	4.0	3.4	4.3	0.3	1.2	0.3	1.0	0.2	0.3	1.1	0.0	0.3	0.1	0.2	0.2	0.1	1.2	2.5	0.2	1.5	0.6	
4	Day	North Fence	27/11/24 15:46	2590	L90		2.0	1.1	0.1	0.9	1.1	0.7	0.4	0.2	0.1	1.2	0.4	0.3	0.1	0.3	0.4	0.4	0.9	0.4	0.7	0.3	0.4	0.5	0.3	1.9	1.3	1.9	0.9	0.4	
4	Night	North Fence	28/11/24 0:00	2594	L90		6.2	0.3	0.6	0.5	0.9	1.2	2.0	1.5	0.8	1.3	0.3	0.0	1.8	0.7	0.1	0.3	1.6	0.6	0.6	0.6	0.7	0.1	1.7	0.7	0.2	0.2	0.3	0.2	
4	Evening	North Fence	28/11/24 21:00	2606	L90		5.3	4.0	1.8	0.1	1.2	1.4	1.7	0.6	1.7	0.0	0.9	0.1	2.9	1.3	1.1	0.5	0.3	0.4	0.6	0.3	0.8	0.5	1.4	0.3	0.1	4.7	3.2	4.8	
4	Night	North Fence	2/12/24 0:00	2644	L90		7.6	0.7	1.3	1.9	1.7	1.6	2.4	1.2	0.6	1.0	0.2	0.7	2.7	0.4	0.3	0.7	0.4	0.4	0.1	0.5	1.4	0.1	1.3	1.1	0.2	0.2	2.3	2.1	
4	Night	North Fence	4/12/24 0:00	2645	L90		5.1	0.8	0.8	1.8	0.2	1.1	1.5	1.6	1.5	0.0	1.1	0.7	0.7	0.0	0.1	0.2	1.4	1.1	0.6	0.4	0.9	0.8	0.3	1.4	0.7	3.8	1.8	6.4	
4	Evening	North Fence	4/12/24 21:00	2646	L90		6.3	1.1	0.7	0.3	0.9	1.3	2.4	0.9	0.3	0.5	0.9	0.7	2.3	0.6	0.3	0.2	0.9	0.5	0.3	0.9	0.5	1.4	0.0	2.4	0.5	0.2	0.2	0.9	
4	Day	North Fence	6/12/24 14:00	2646	L90		0.4	1.2	0.1	0.1	0.1	1.9	3.4	2.3	1.2	0.0	0.9	1.0	2.6	1.1	0.0	0.2	1.3	0.5	1.2	2.1	0.5	0.4	0.2	4.8	3.1	2.2	3.4	1.1	
4	Night	North Fence	10/12/24 0:00	2647	L90		6.3	1.7	0.3	1.3	1.2	2.0	5.2	1.2	3.2	1.2	0.3	0.2	2.3	1.1	0.0	0.6	0.7	0.3	0.3	0.6	0.1	1.1	1.5	1.2	0.2	0.2	0.3	0.2	
4	Day	North Fence	10/12/24 14:00	2648	L90		6.8	0.4	0.4	1.3	0.4	1.2	2.6	0.3	1.4	1.0	1.1	0.4	1.8	0.5	0.0	0.0	0.5	0.3	0.0	0.7	0.6	0.6	1.0	2.0	1.9	0.5	5.0	1.9	
4	Evening	North Fence	10/12/24 21:00	2649	L90		5.9	0.0	0.7	0.6	1.2	0.9	3.8	0.2	2.1	0.9	0.8	0.2	1.6	0.3	0.6	0.3	0.9	0.1	0.2	0.8	0.3	1.1	0.3	1.5	0.6	0.2	0.3	0.2	
4	Day	North Fence	11/12/24 10:17	2650	L90		5.7	1.2	0.0	0.4	1.1	1.9	1.2	0.3	4.0	3.0	2.5	2.2	1.2	1.0	0.3	0.8	1.0	0.3	0.4	0.3	0.9	0.0	1.4	2.4	2.2	1.7	4.0	0.6	
5	Day	Location 20	27/11/24 15:23	2651	L90		0.4	0.4	0.9	0.1	0.1	0.8	0.6	0.8	1.4	1.4	0.4	0.4	1.0	0.6	0.0	0.1	1.8	0.7	0.3	0.1	0.6	1.1	0.6	0.8	1.4	0.2	0.0	0.2	
5	Day	Loc 20	11/12/24 11:15	2652	L90		6.1	0.5	1.3	0.1	0.3	0.8	1.7	1.2	4.6	3.4	1.2	0.6	2.6	0.8	0.9	1.5	0.8	0.6	0.2	0.3	1.1	1.1	0.2	2.2	0.5	0.5	0.2	0.2	

NOTE: Pink Shading indicates Tonality objective is exceeded

Figure A1: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LAeq spectra for 4 Melbourne St measurements

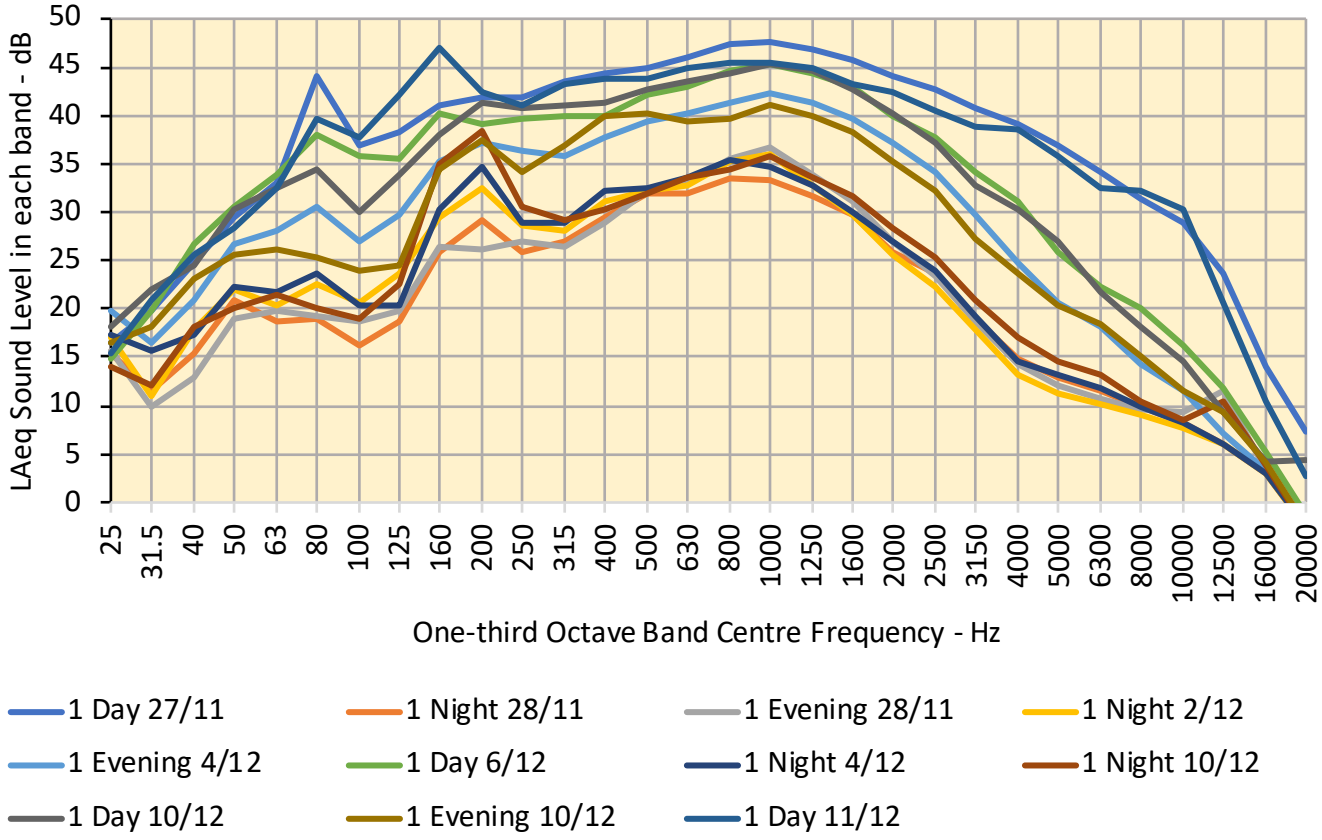

Figure A1A: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LAeq Tonality spectra for 4 Melbourne St measurements

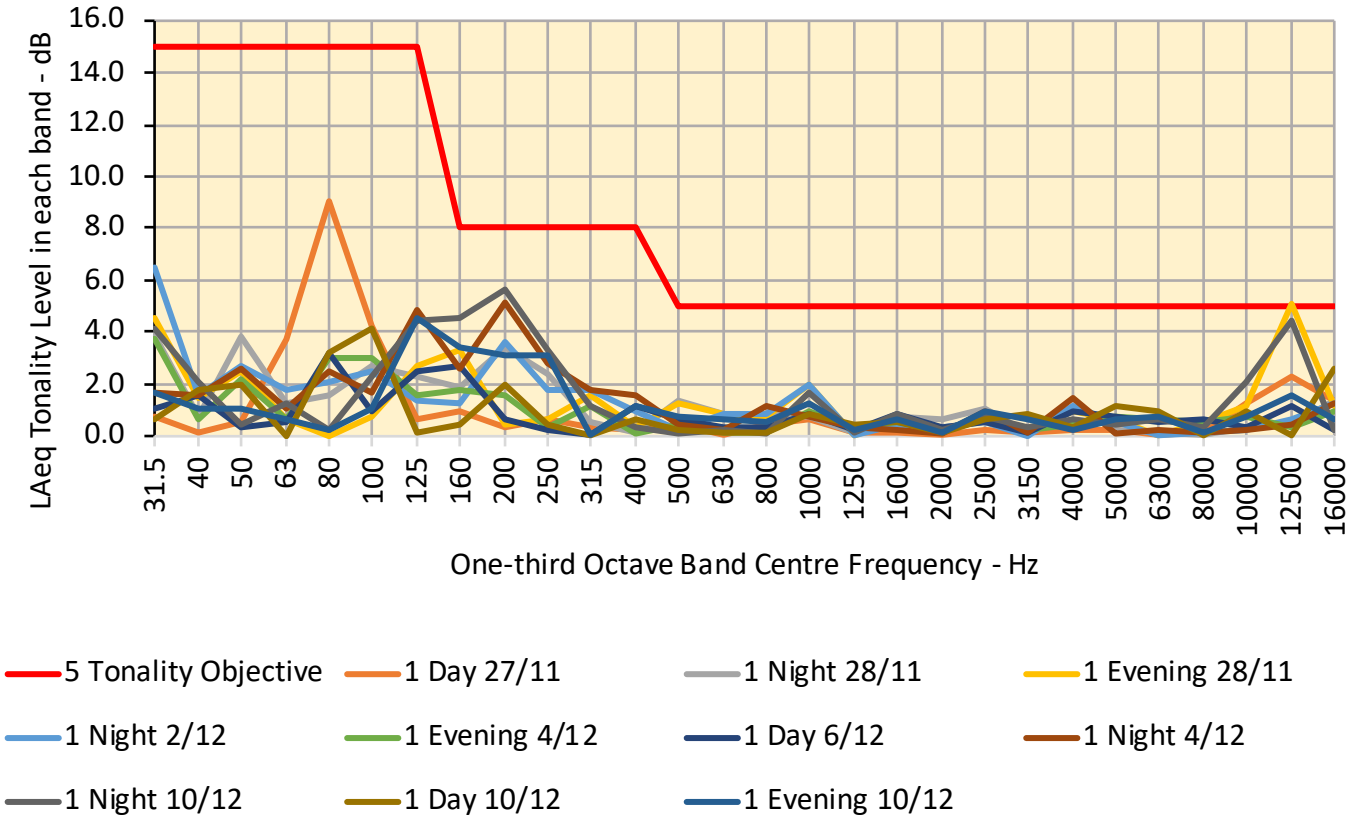

Figure A2: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LA90 spectra for 4 Melbourne St measurements

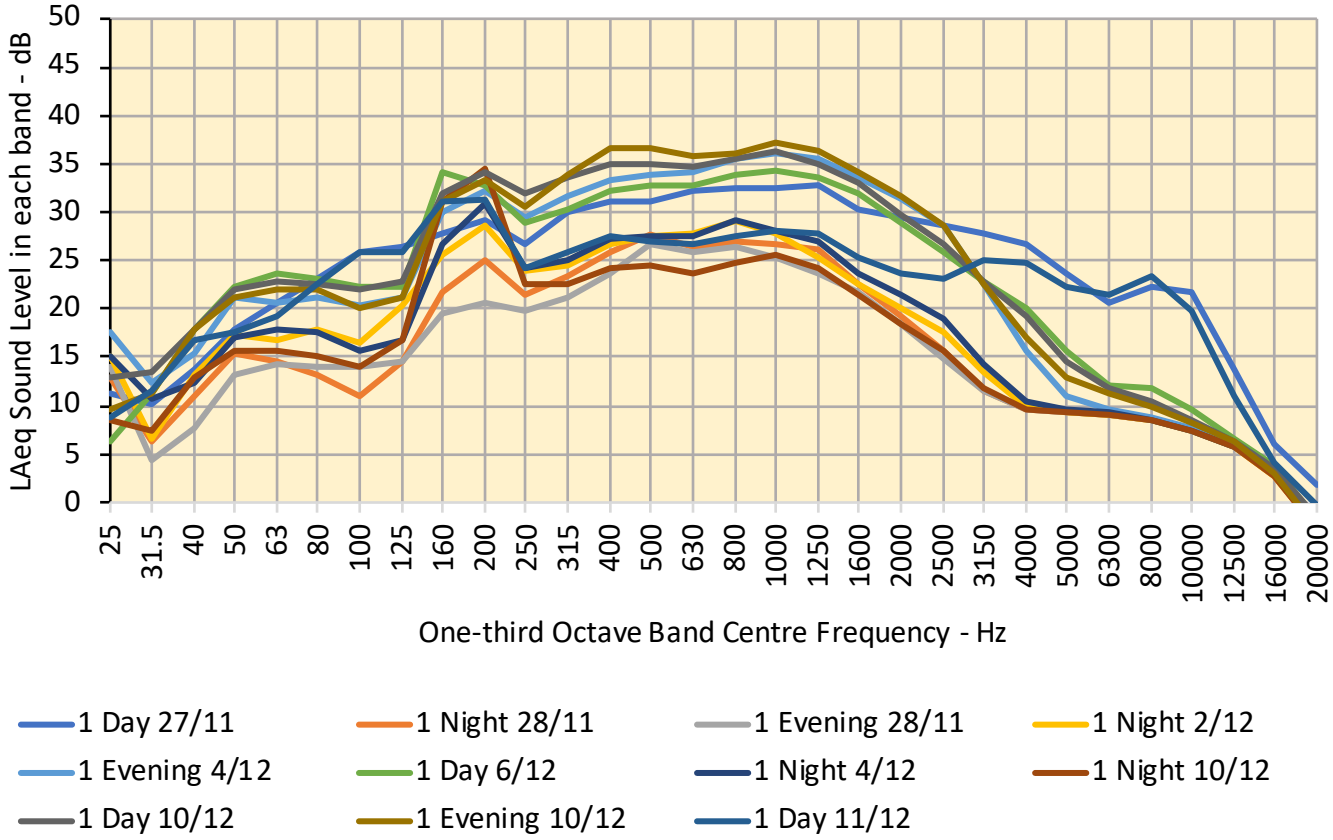

Figure A2A: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LA90 Tonality spectra for 4 Melbourne St measurements

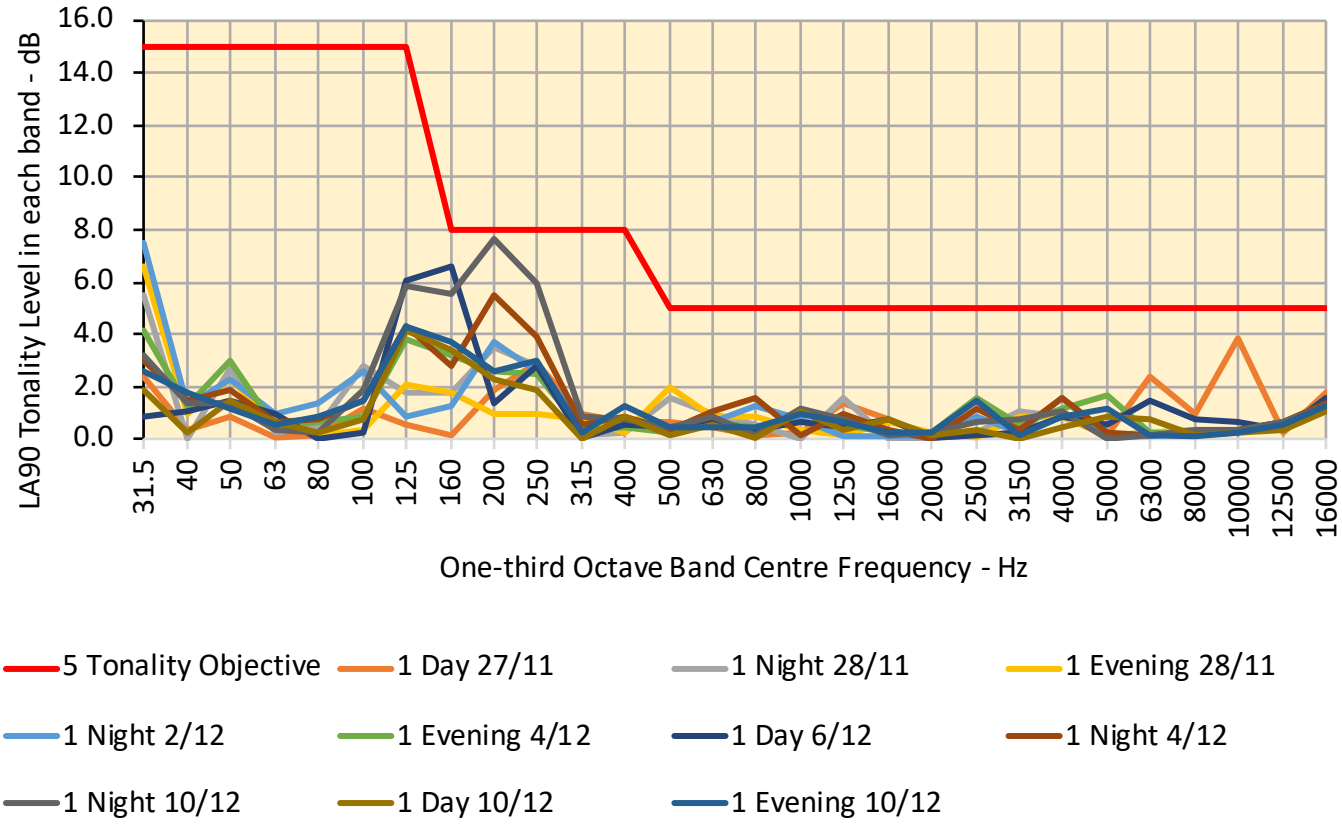

Figure A3: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Daytime 27/11/24

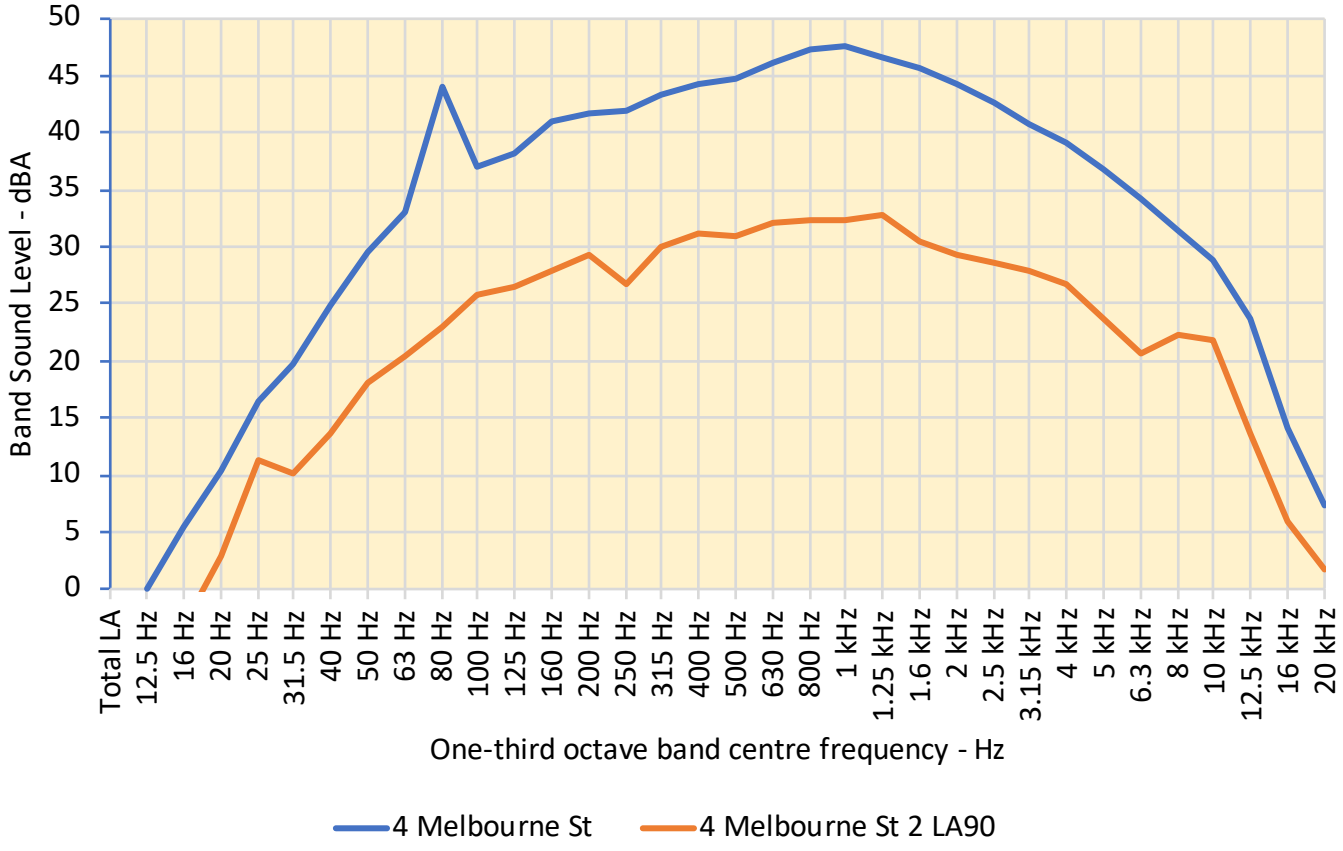

Figure A4: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Daytime 11/12/24

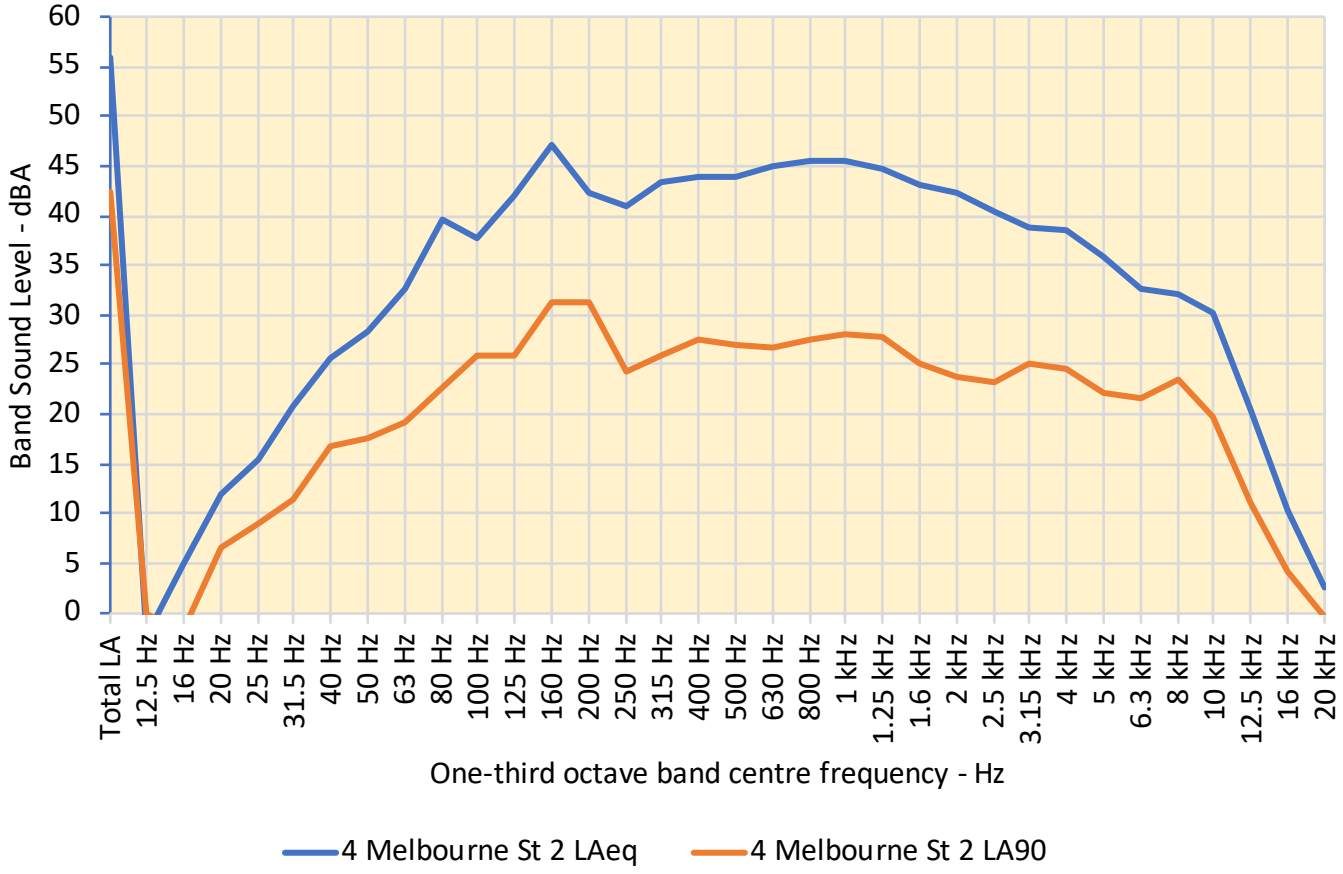

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Figure A5: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Night 28/11/24

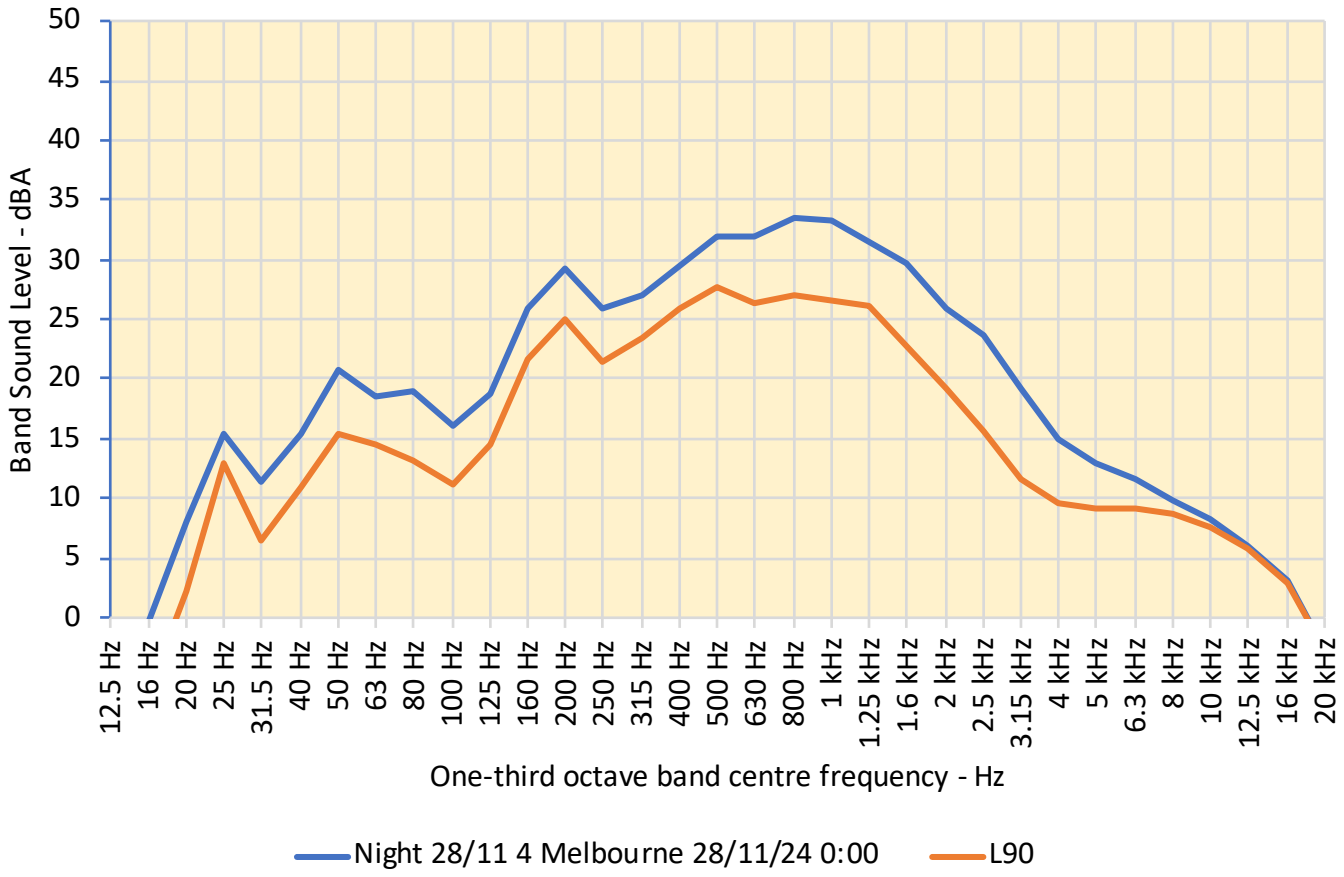

Figure A6: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Night 2/12/24

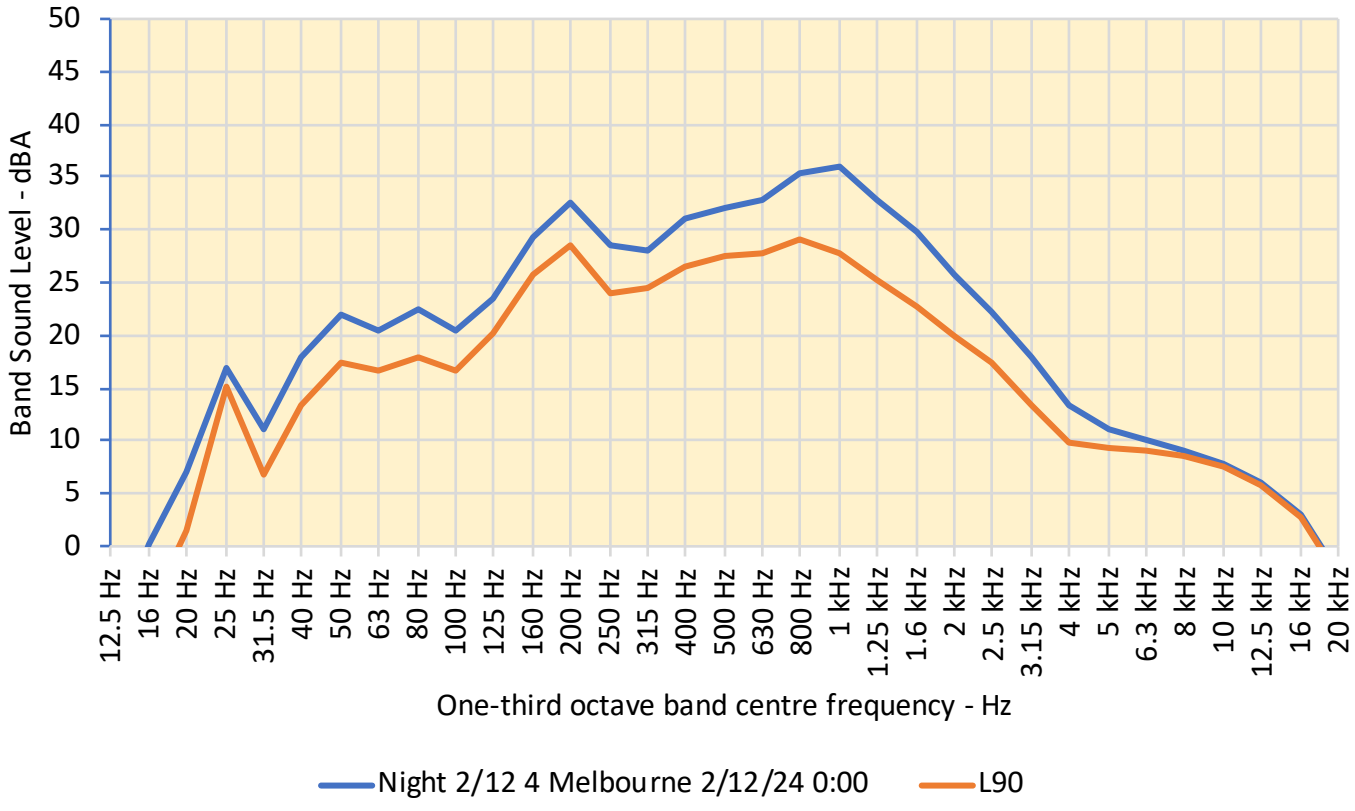

Figure A7: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Night 4/12/24

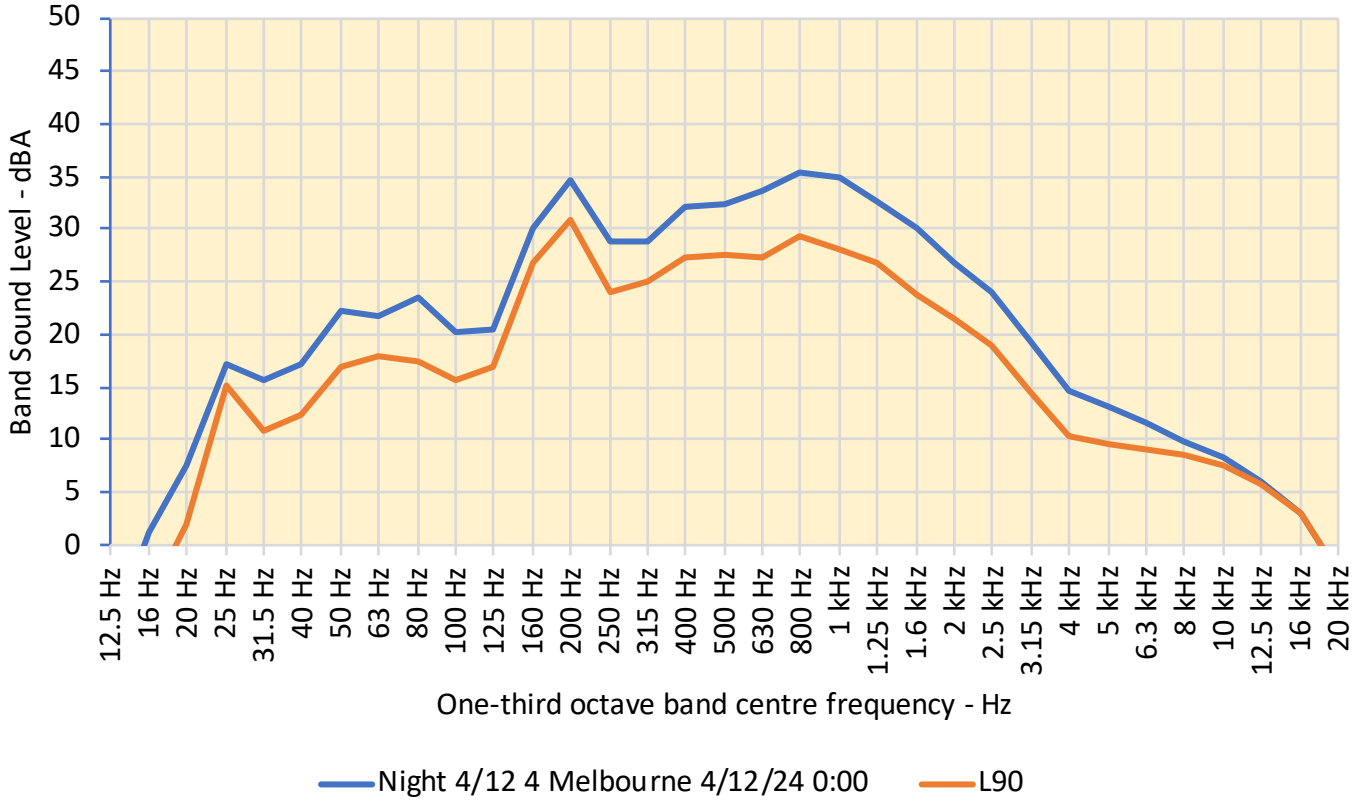

Figure A8: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Night 4/12/24

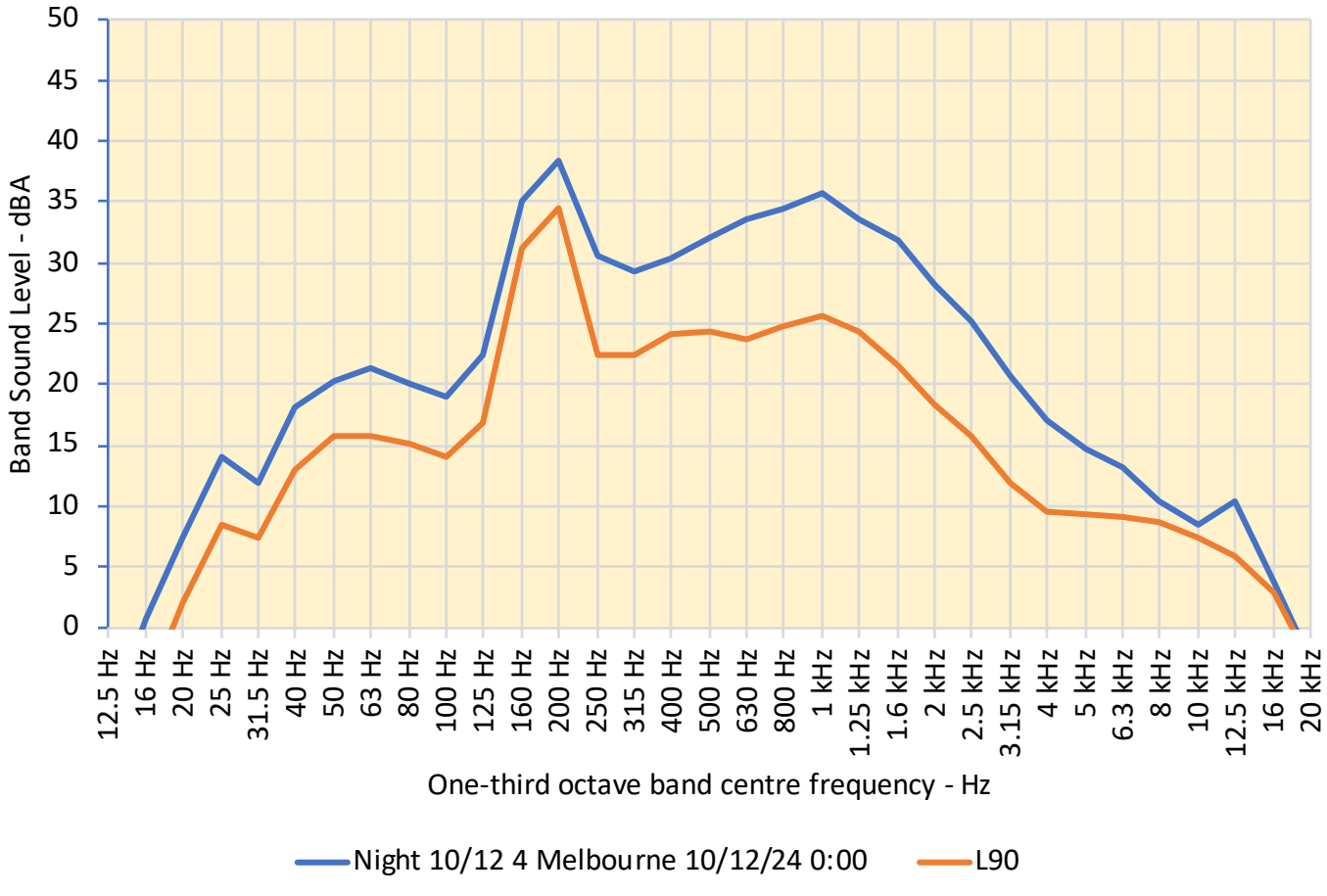

Figure A9: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Evening 28/11/24

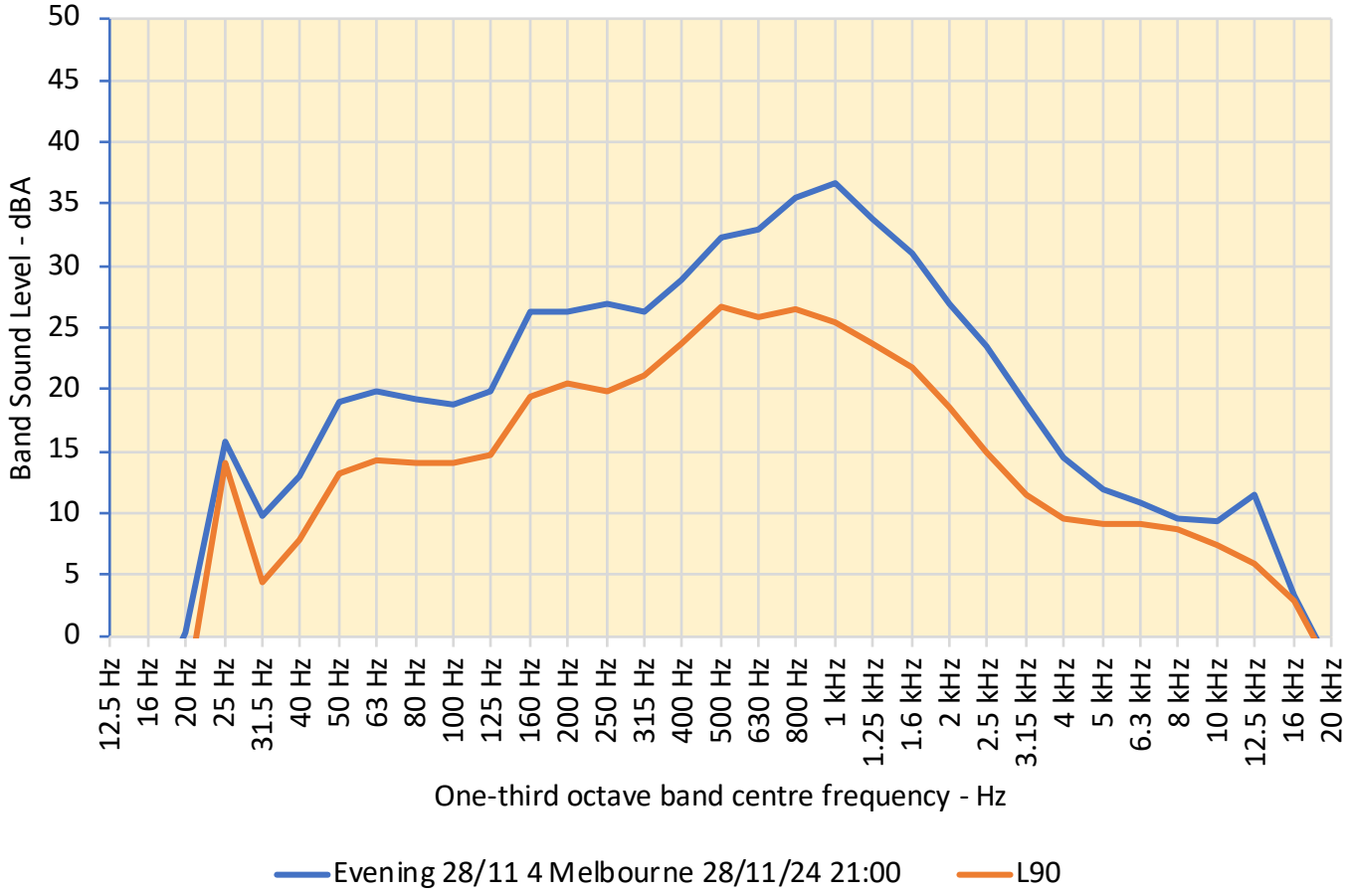

Figure A10: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Evening 4/12/24

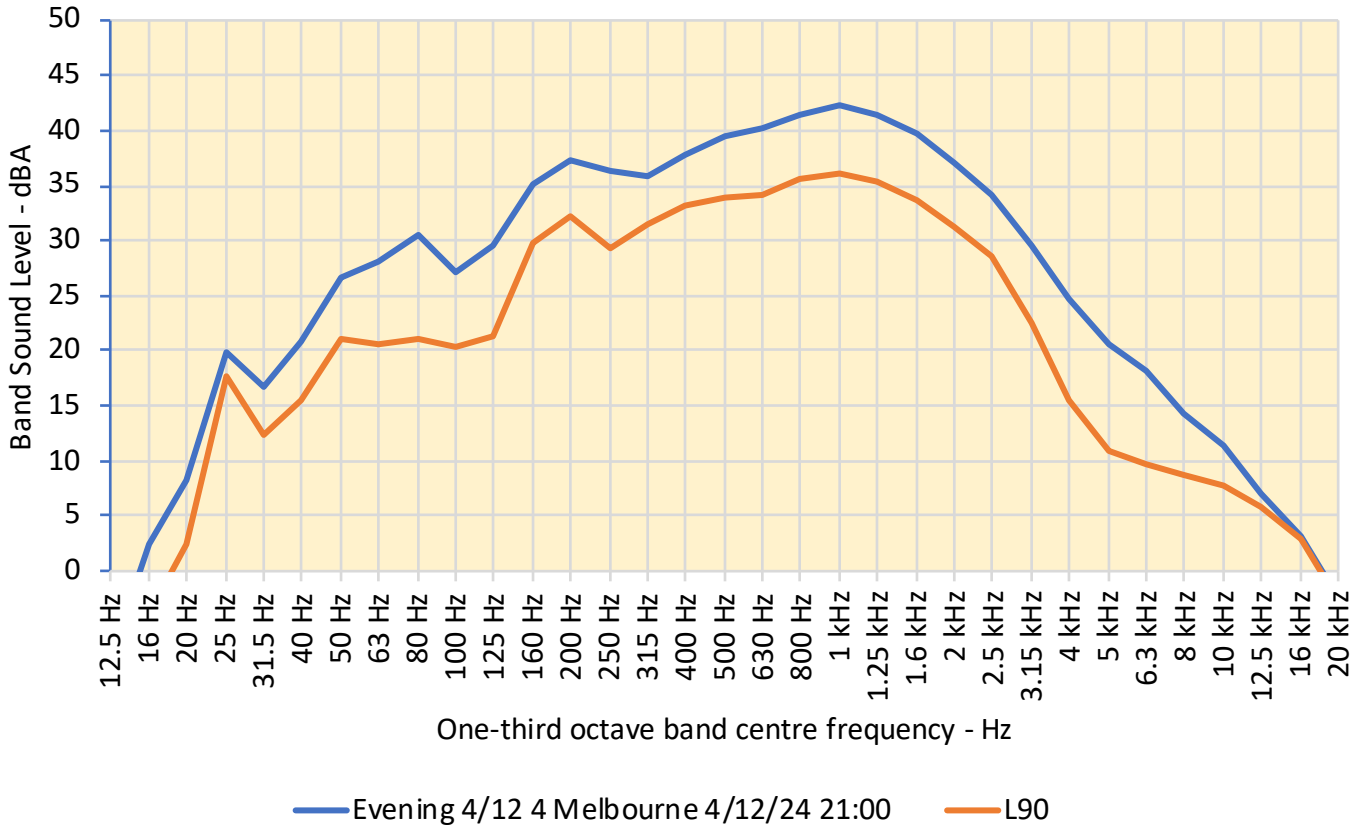

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Figure A11: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Evening 10/12/24

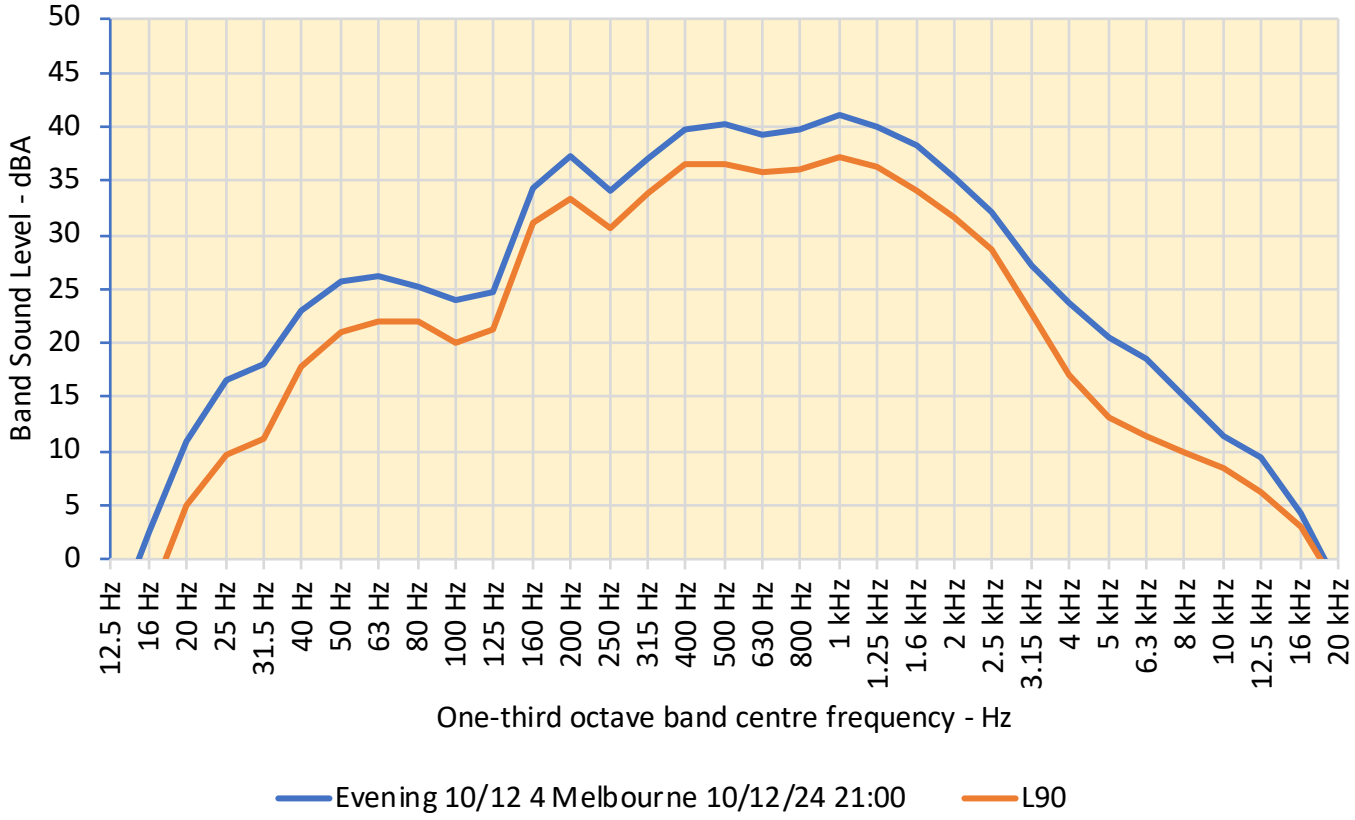

Figure A12: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Day 6/12/24

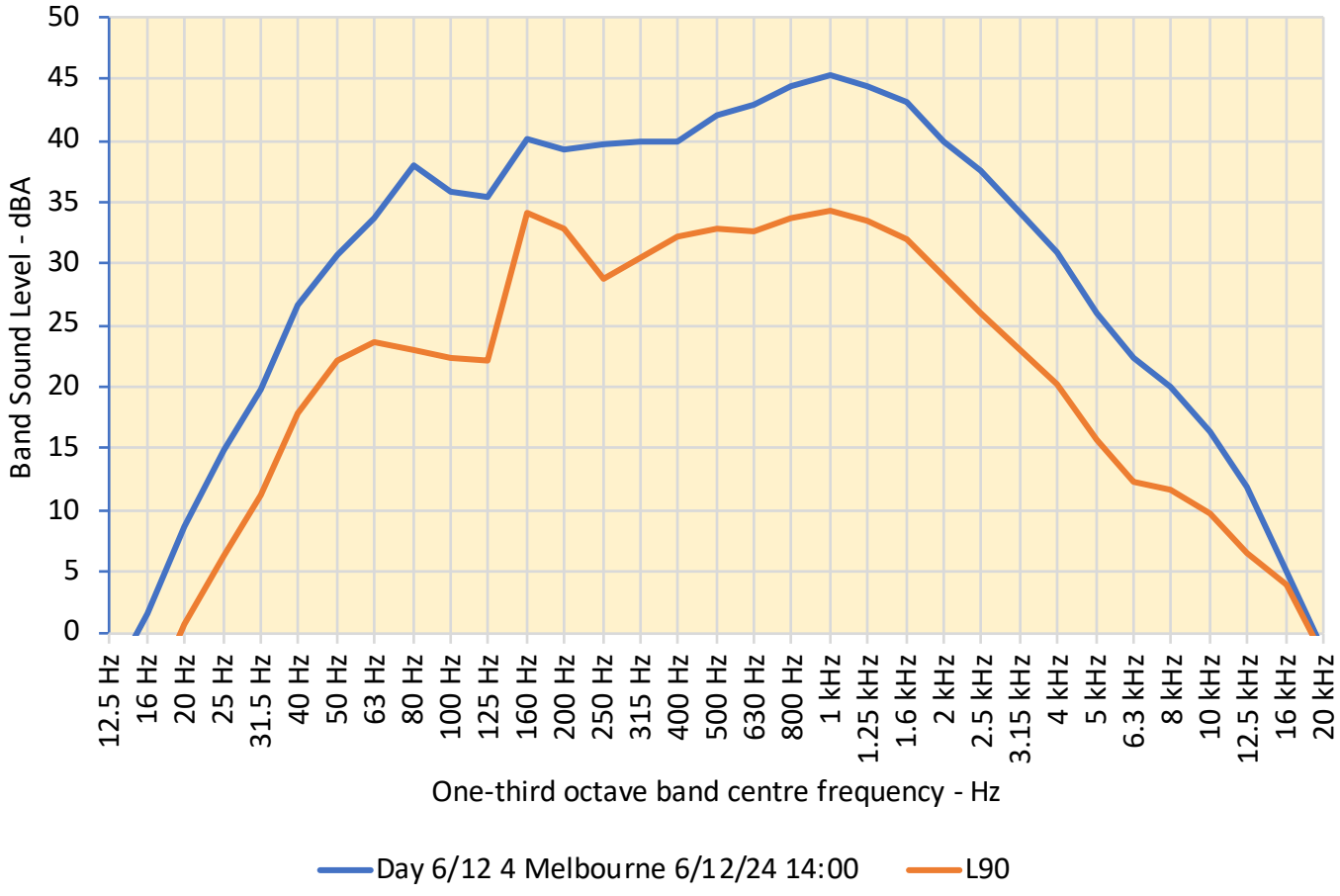

Figure A13: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 4 Melbourne St Day 10/12/24

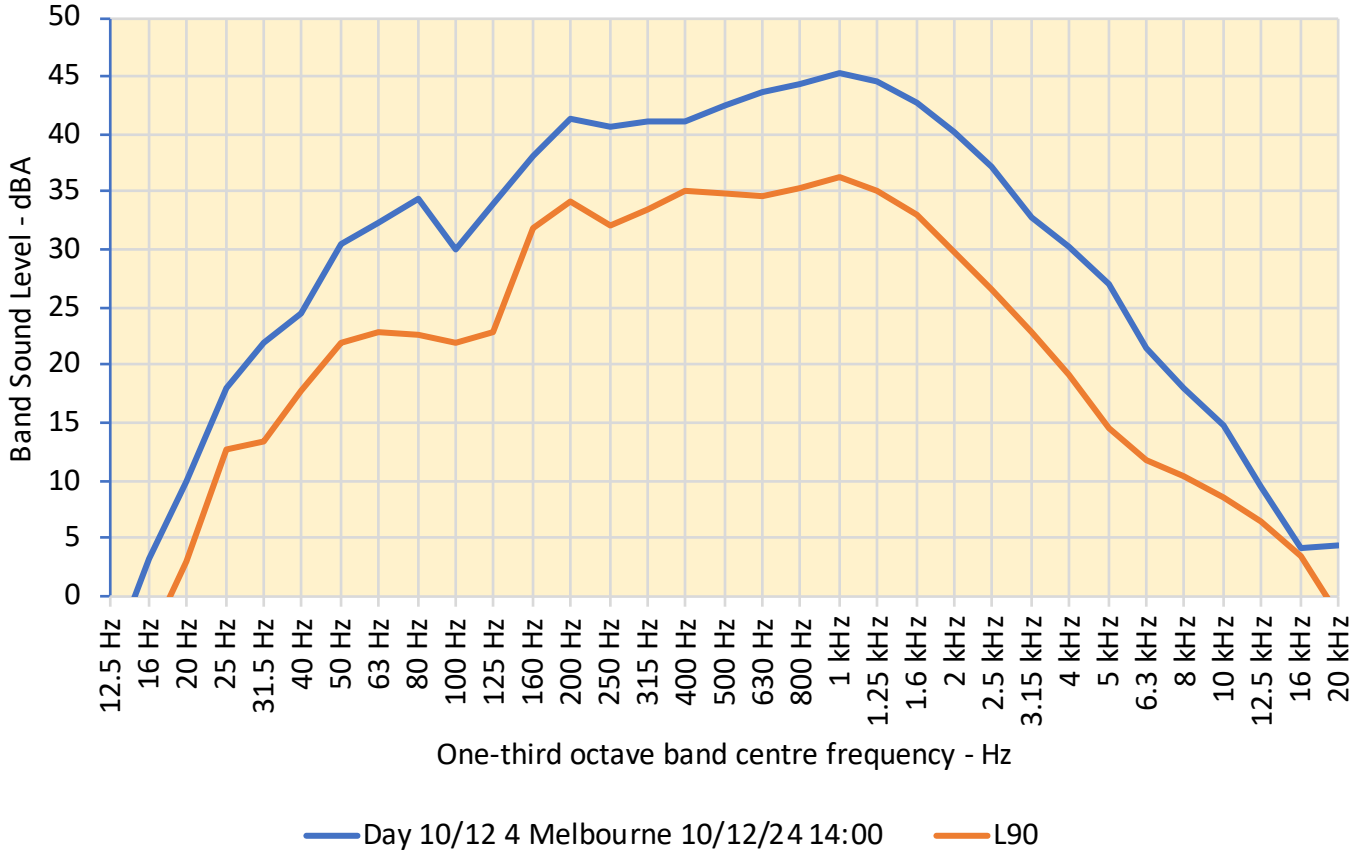

Figure A14: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 12 Brisbane St Day 27/11/24

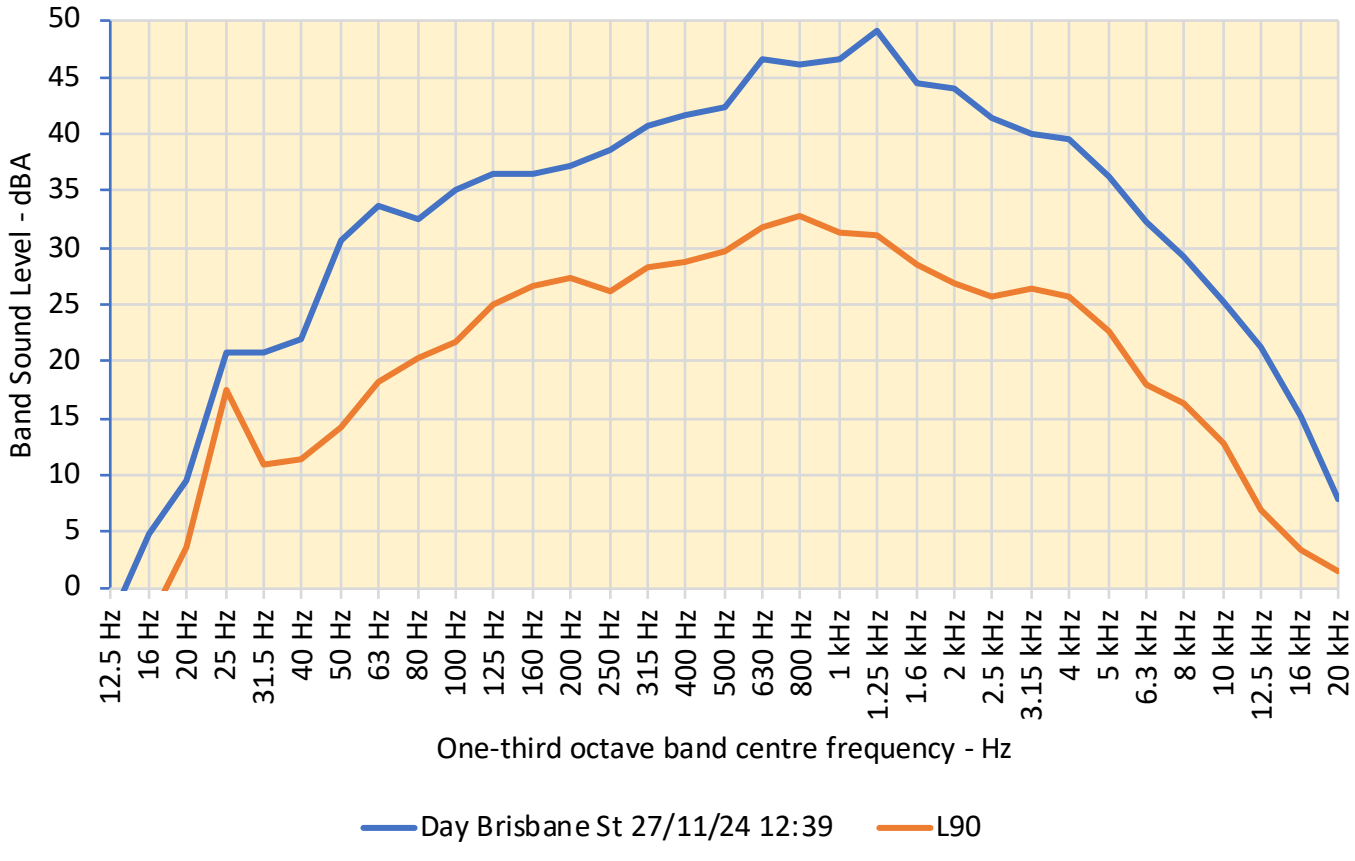

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Figure A15: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring 12 Brisbane St Day 11/12/24

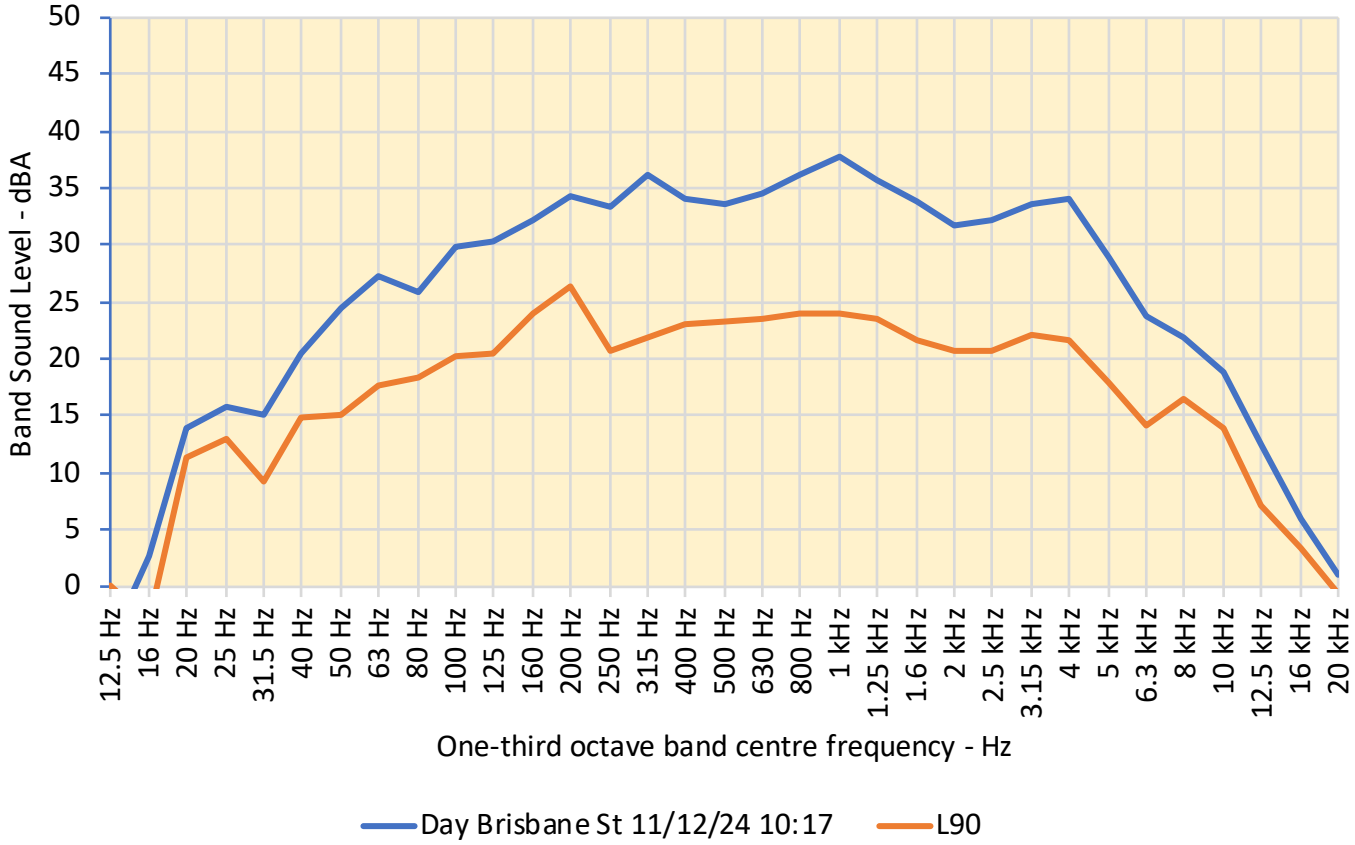

Figure A16: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring Adelaide St Day 27/11/24

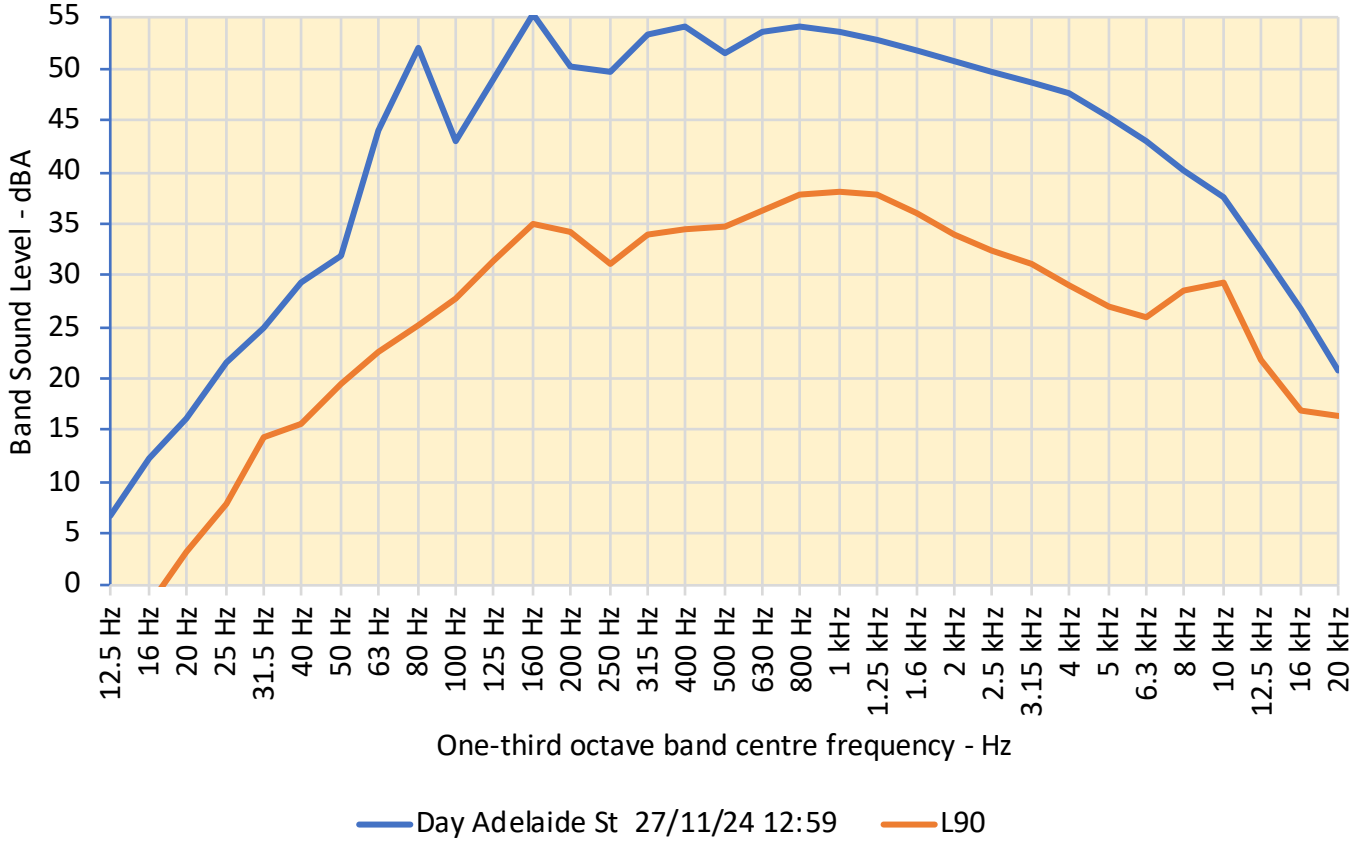

Figure A17: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring Adelaide St Day 11/12/24

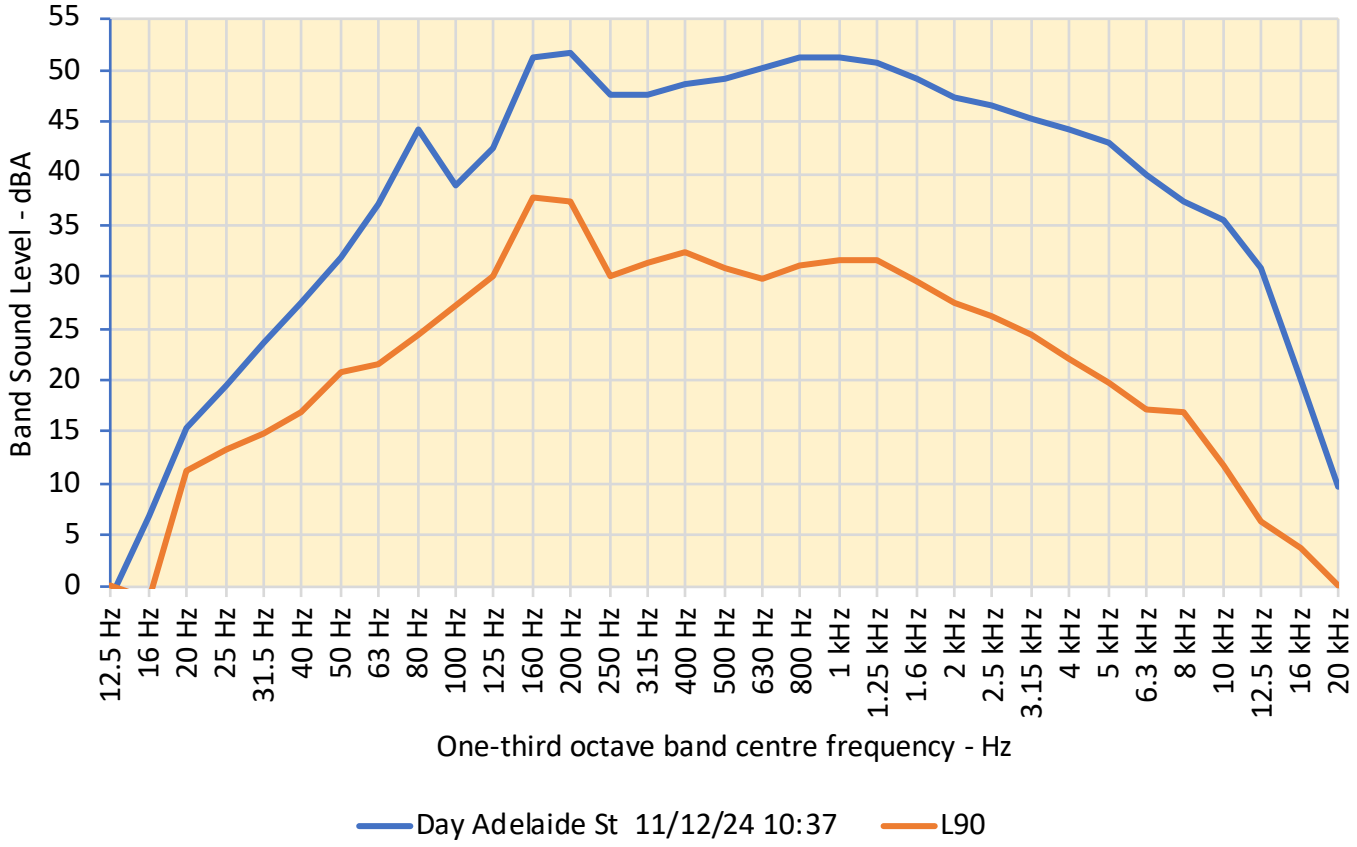

Figure A18: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LAeq spectra for 4 North Fence measurements

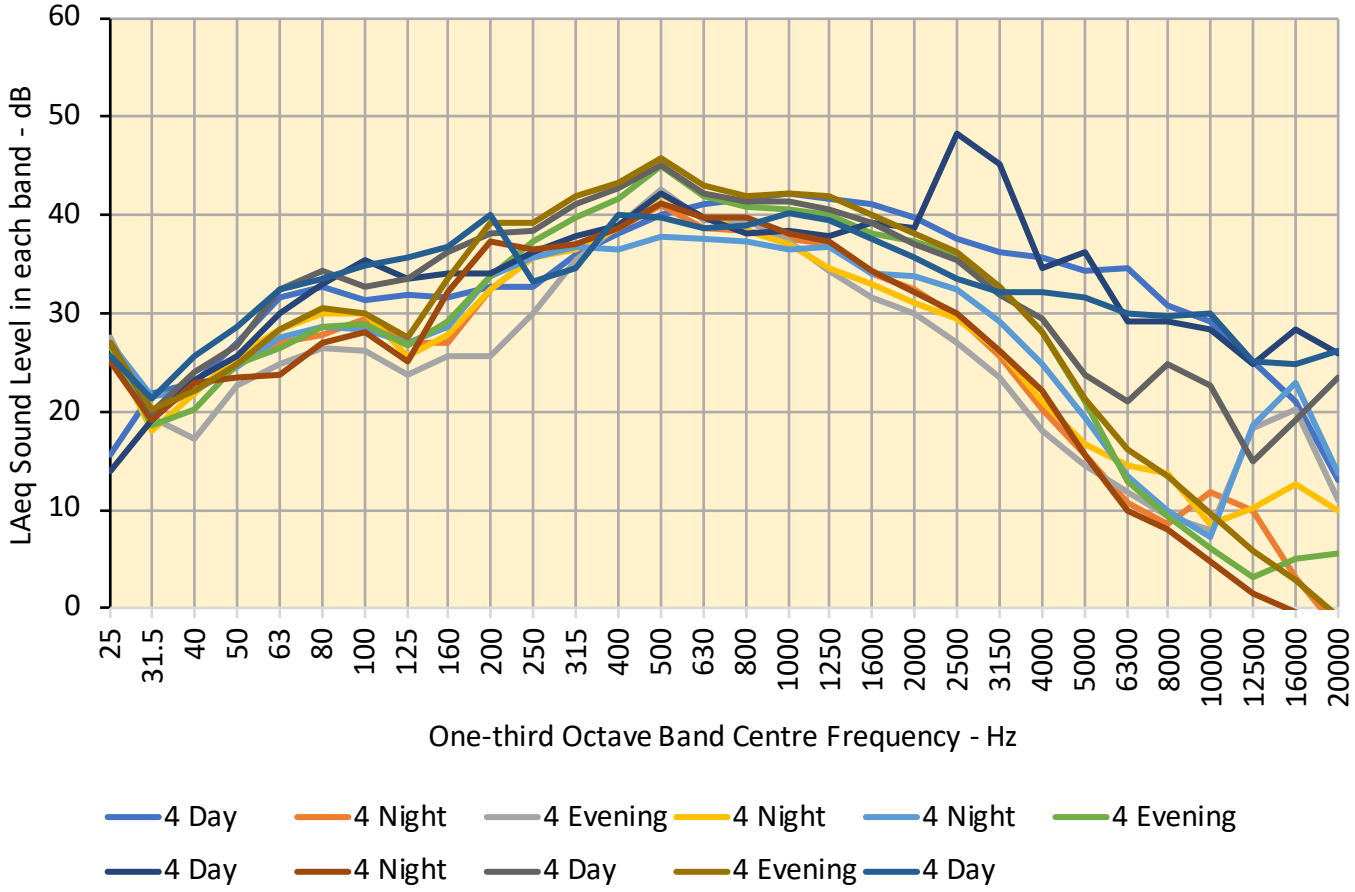

Figure A18A: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LAeq Tonality spectra for North Fence measurements

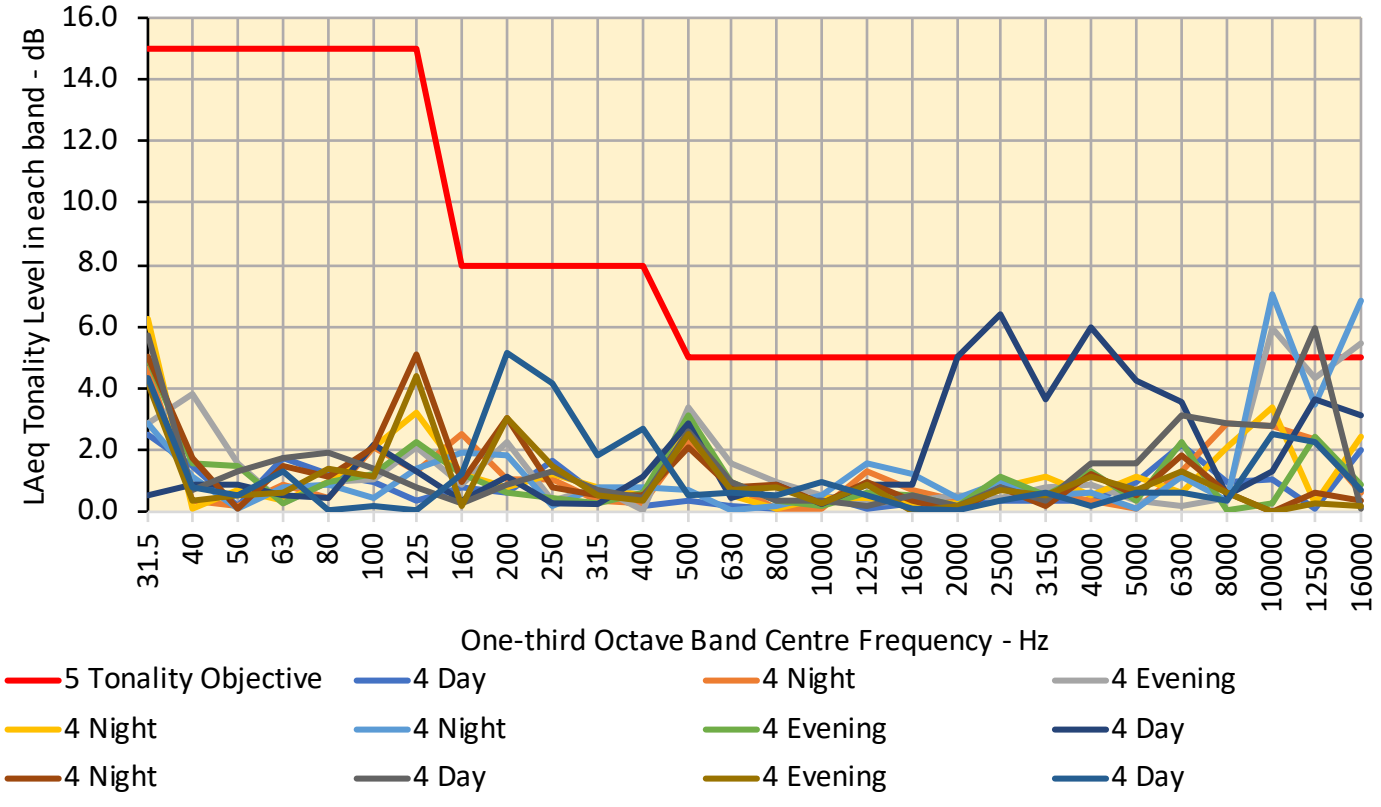

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Figure A19: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LA90 spectra for North Fence measurements

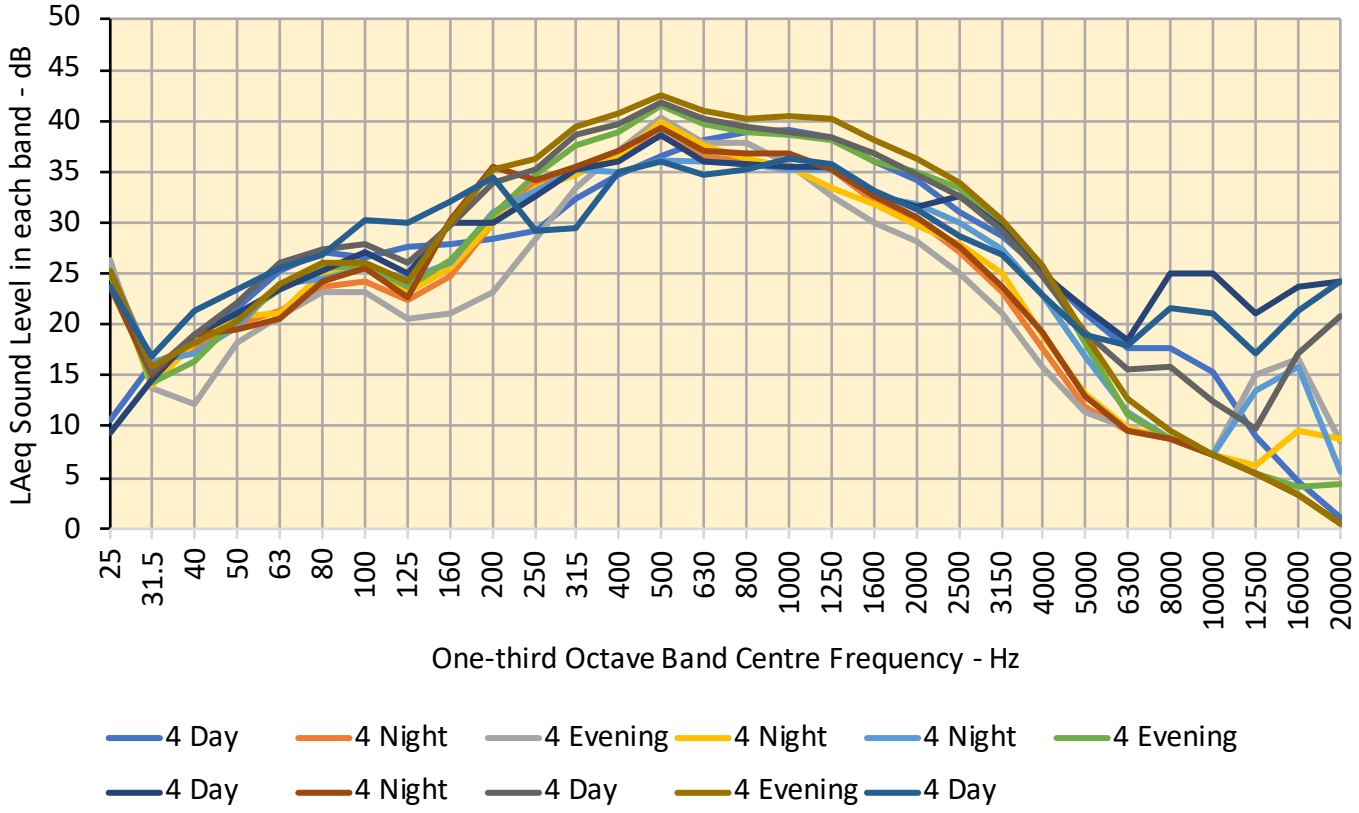

Figure A19A: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LA90 Tonality spectra for North Fence measurements

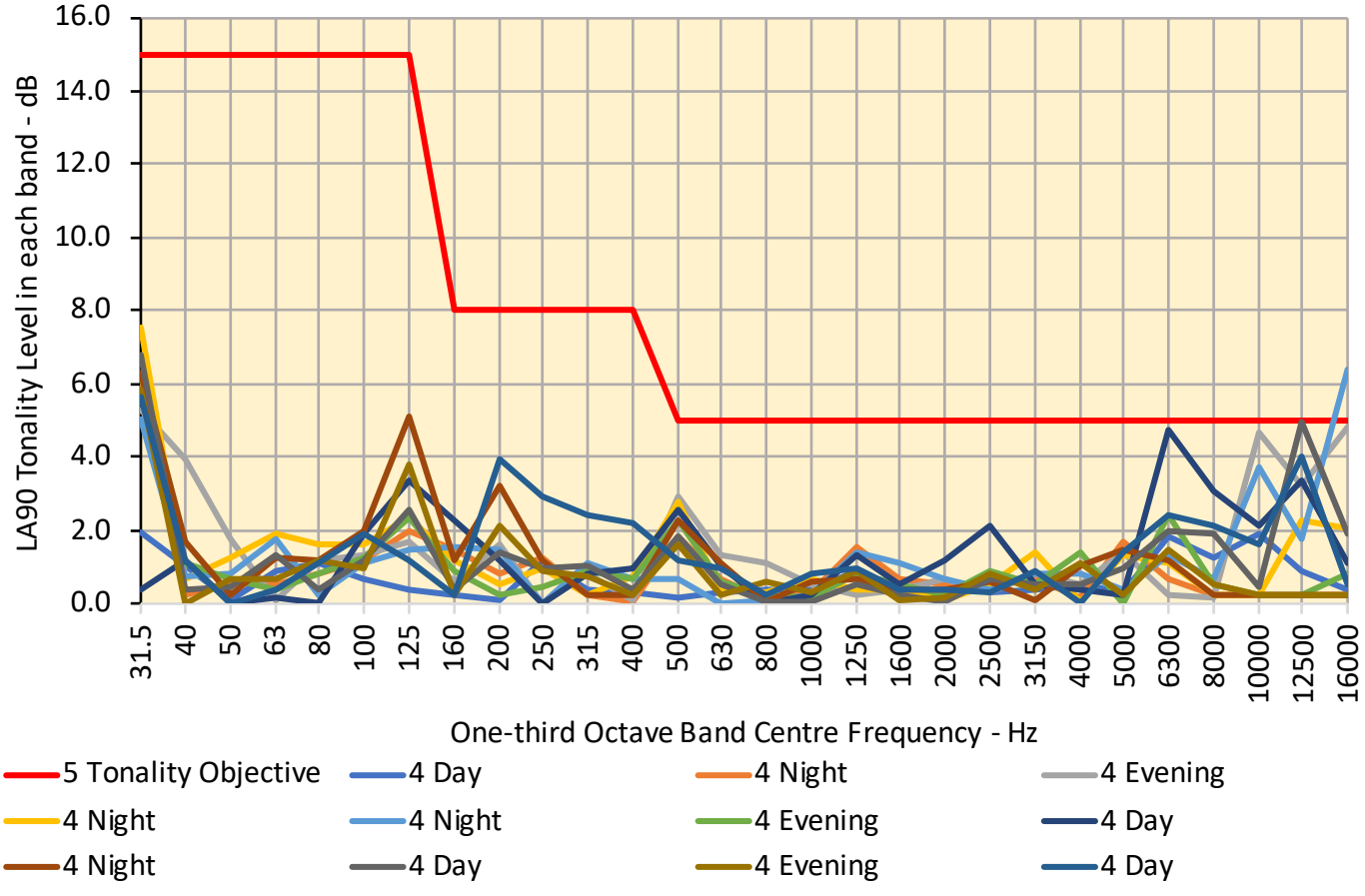

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Figure A20: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Night 28/11/24

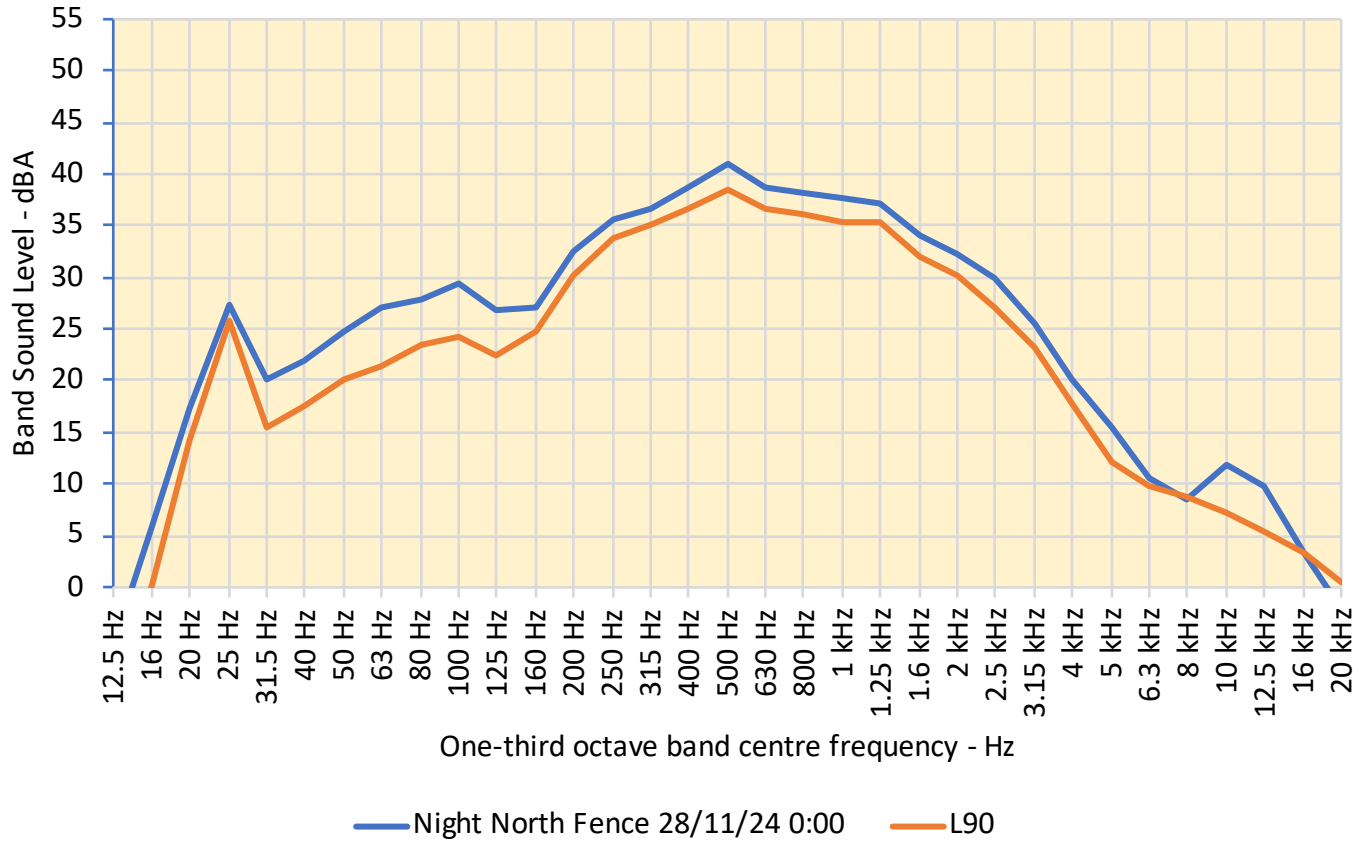

Figure A21: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Night 2/12/24

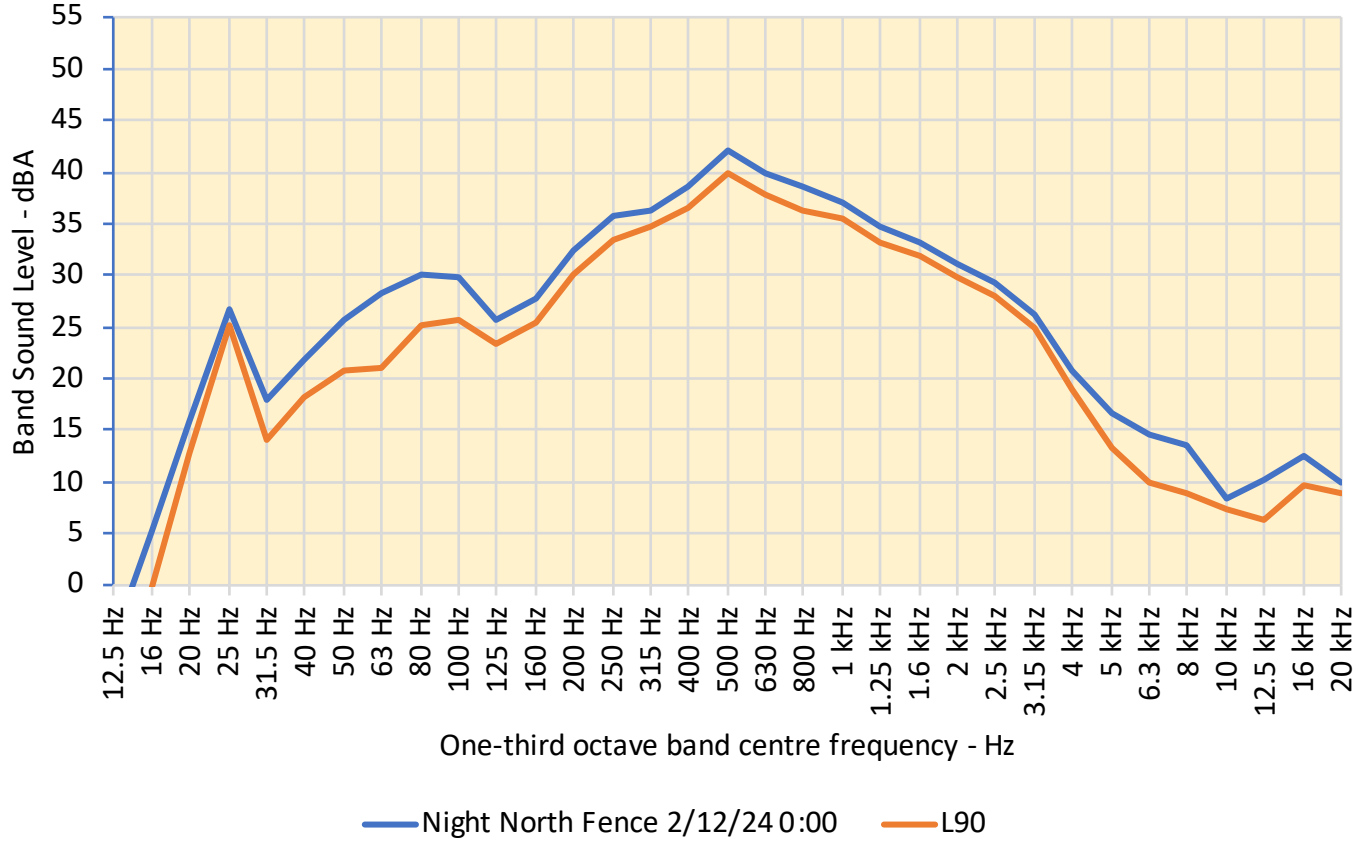

Figure A22: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Night 4/12/24

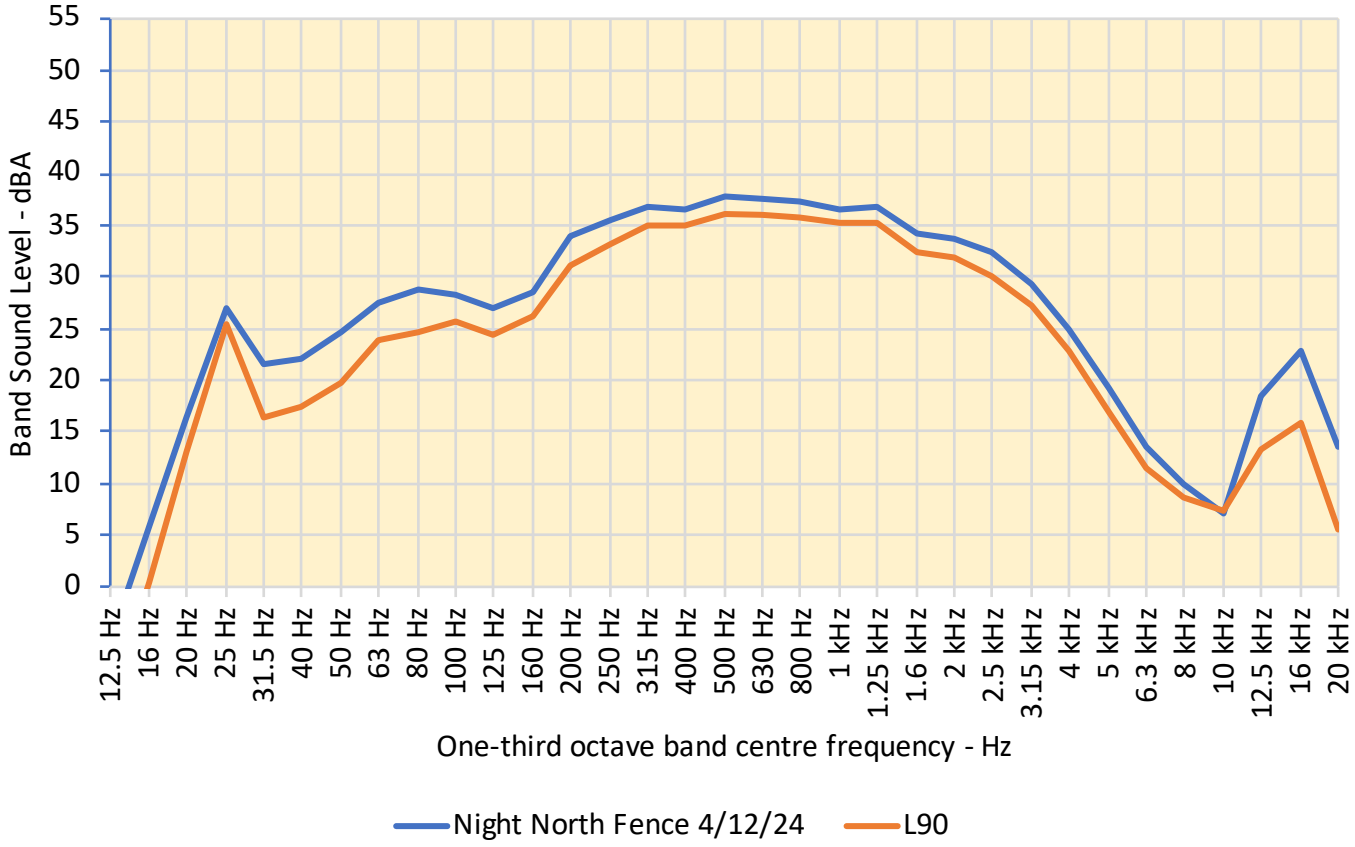

Figure A23: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Night 10/12/24

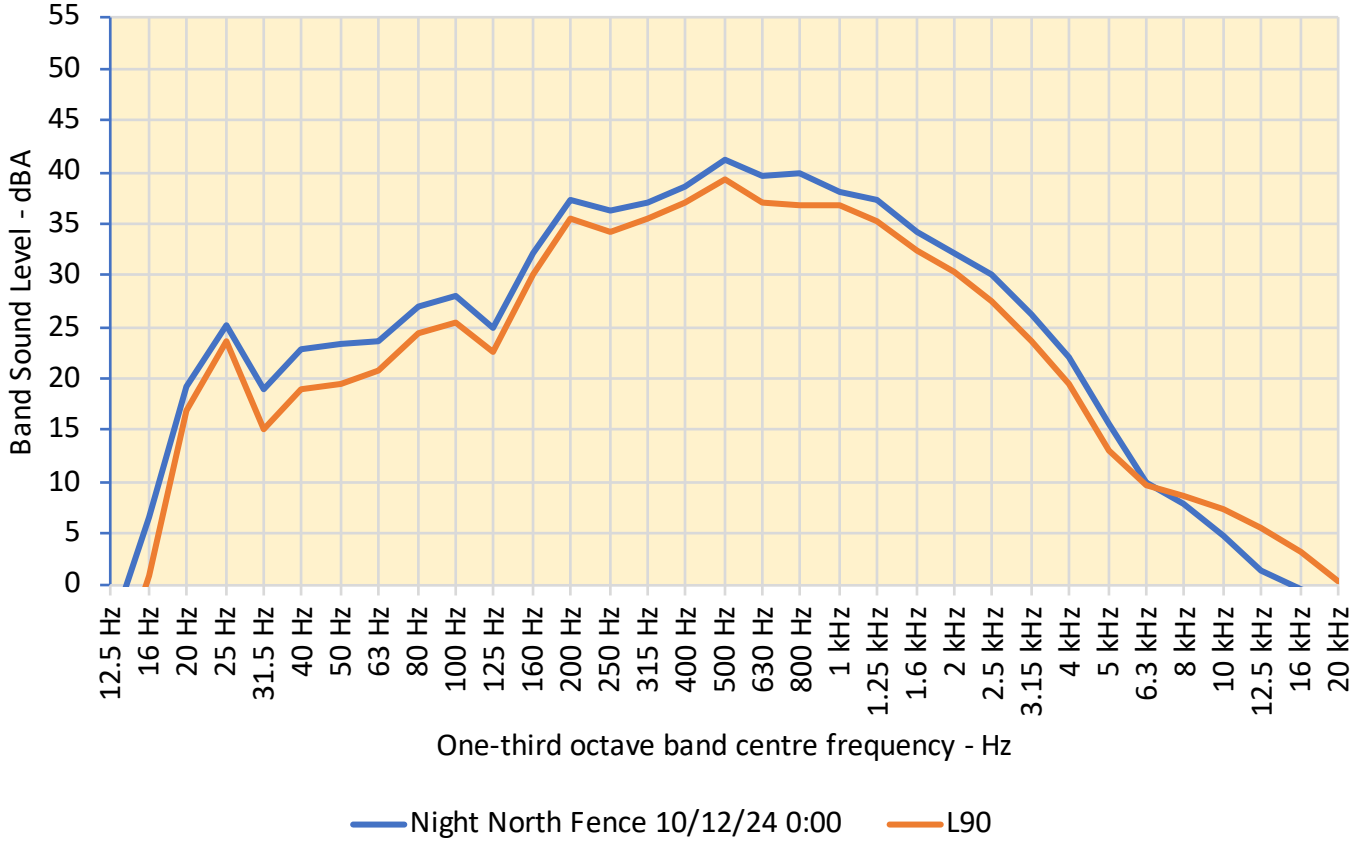

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Figure A24: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Eveninjg 28/11/24

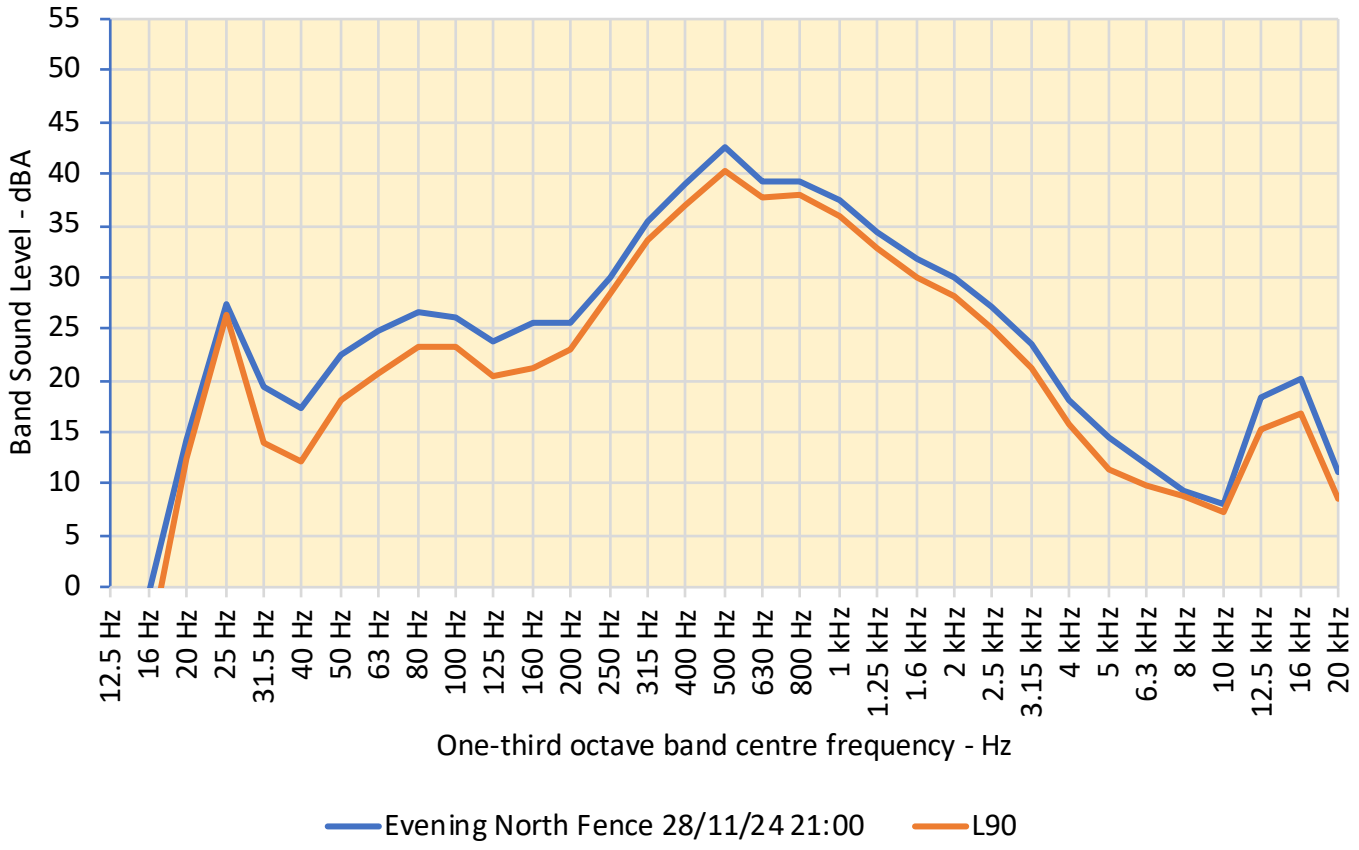

Figure A25: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Evening 4/12/24

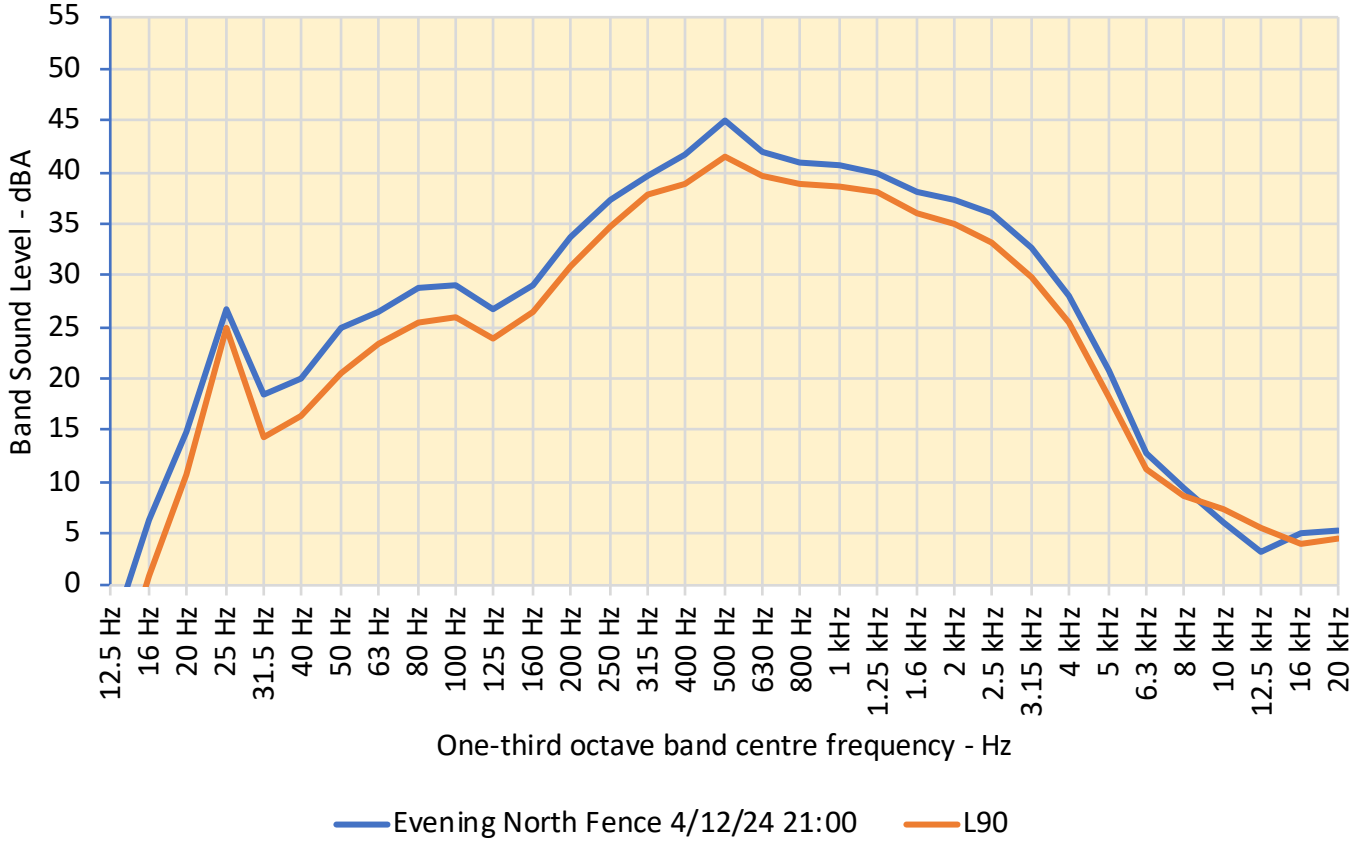

Figure A26: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Evening 10/12/24

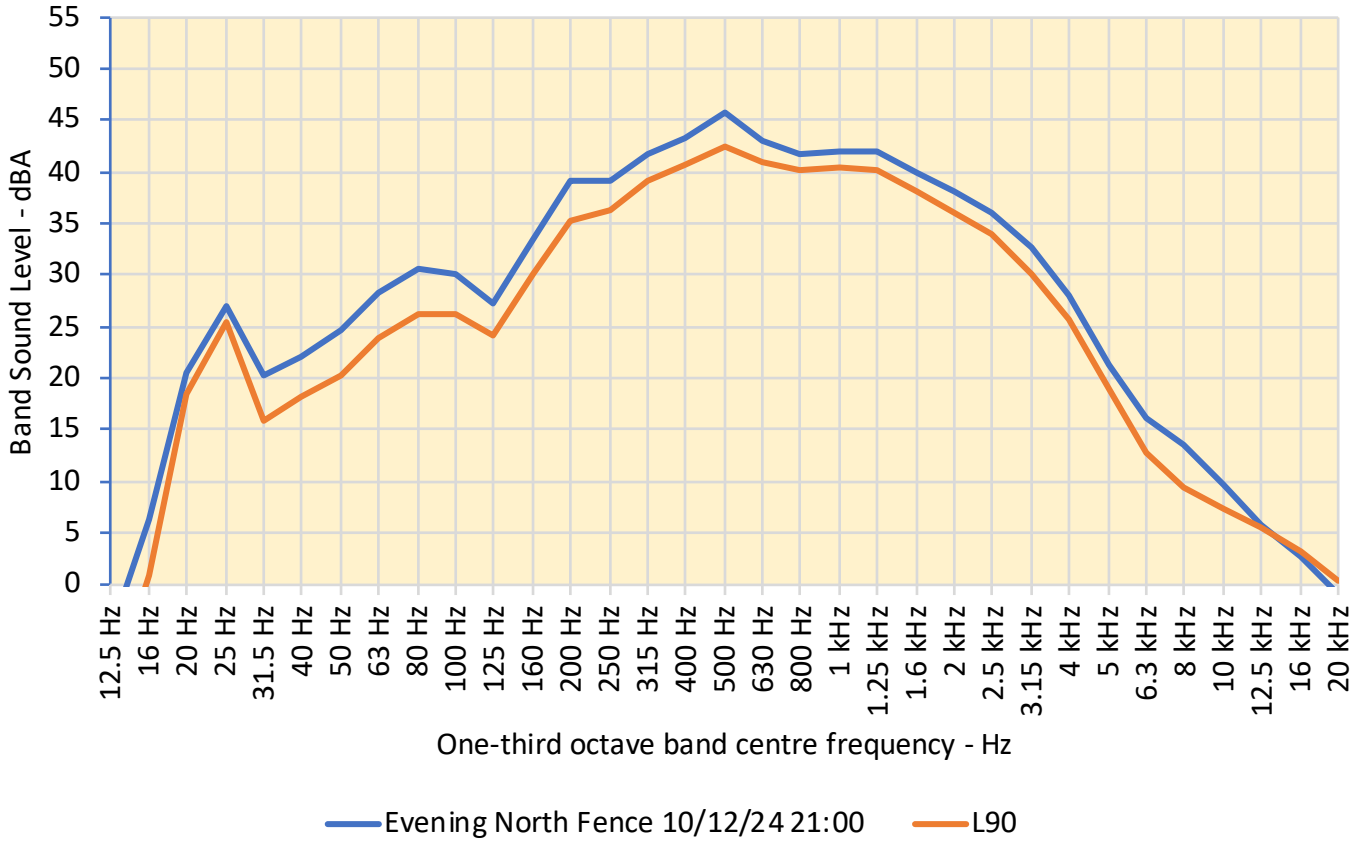

Figure A27: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Daytime 27/11/24

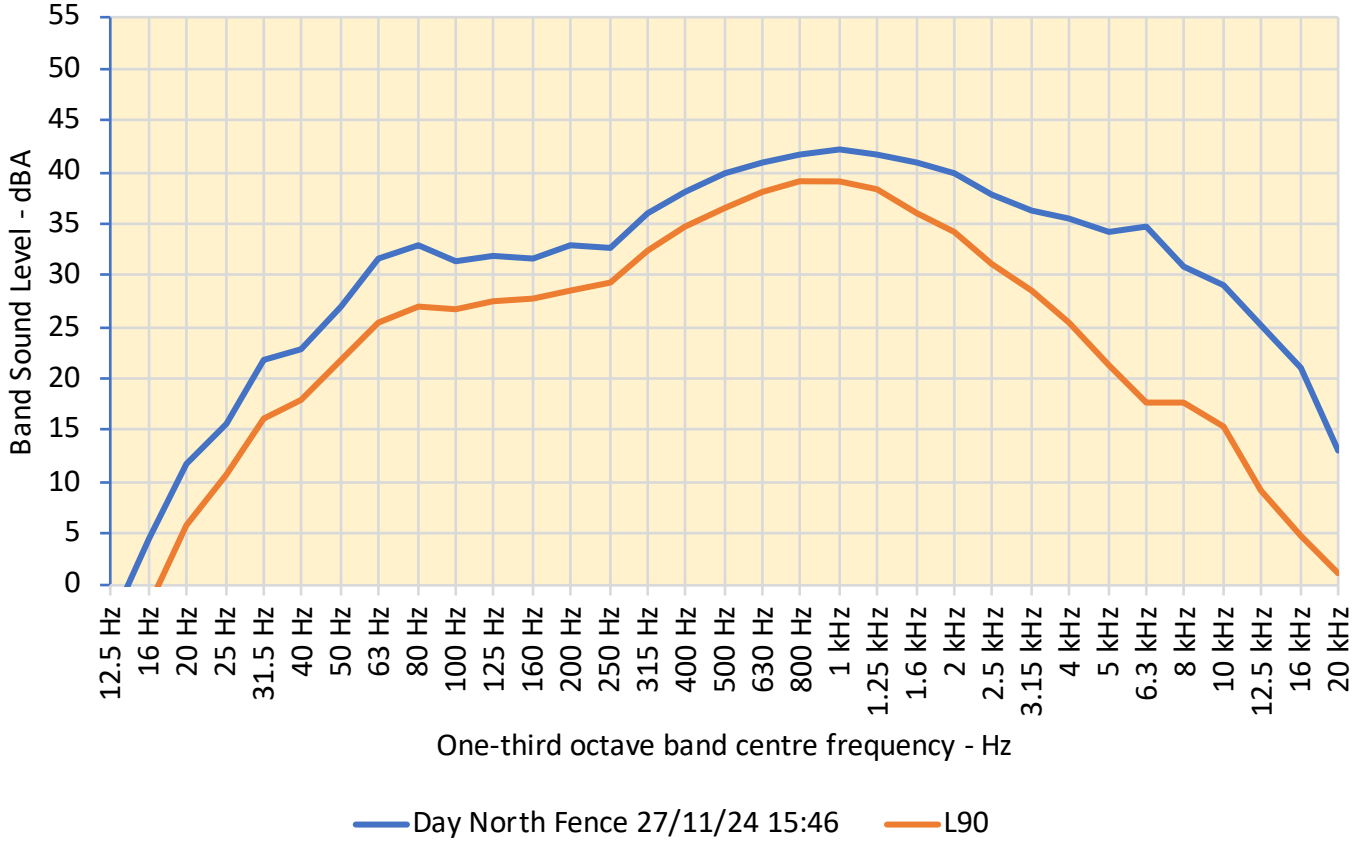

Figure A28: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Daytime 6/12/24

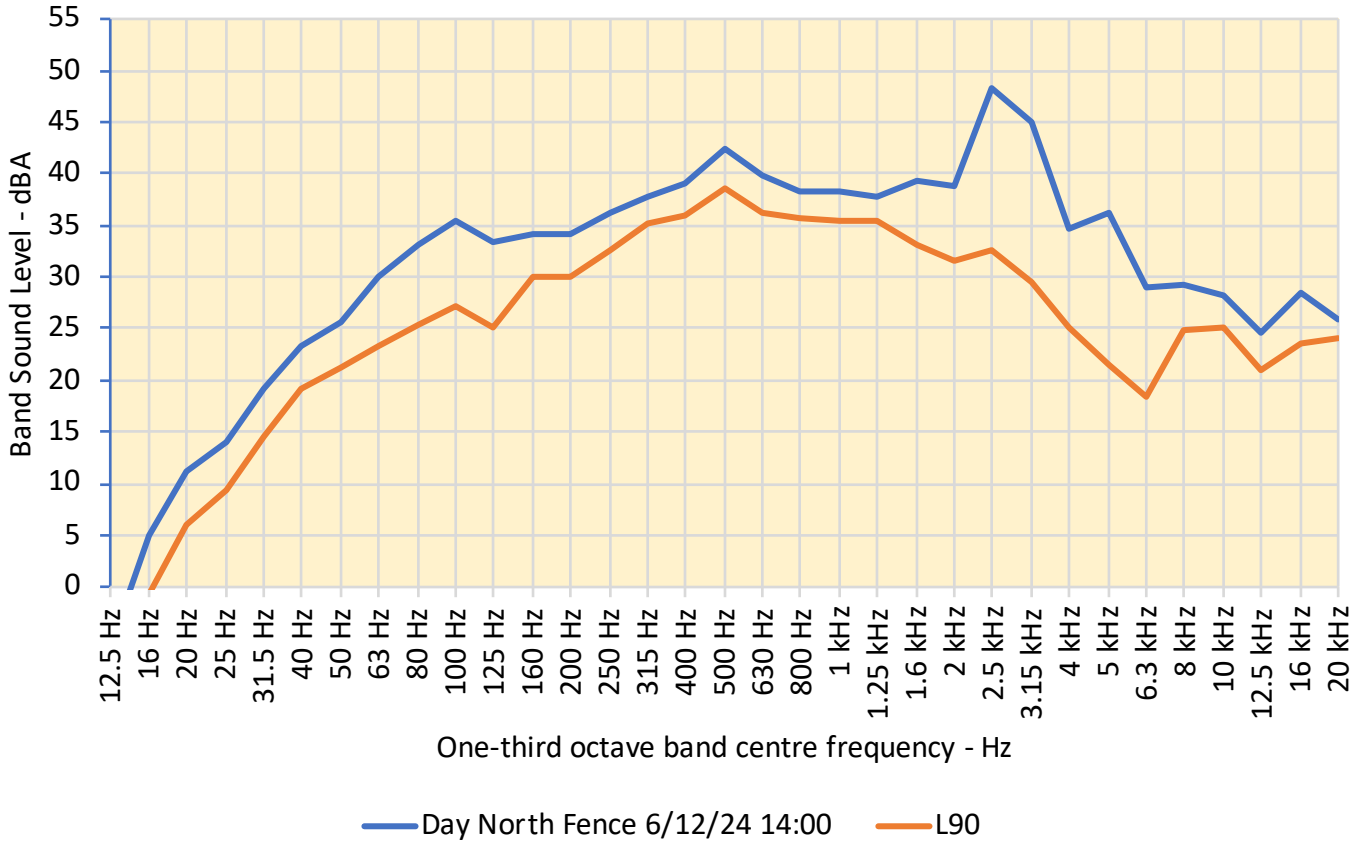

Figure A29: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Daytime 10/12/24

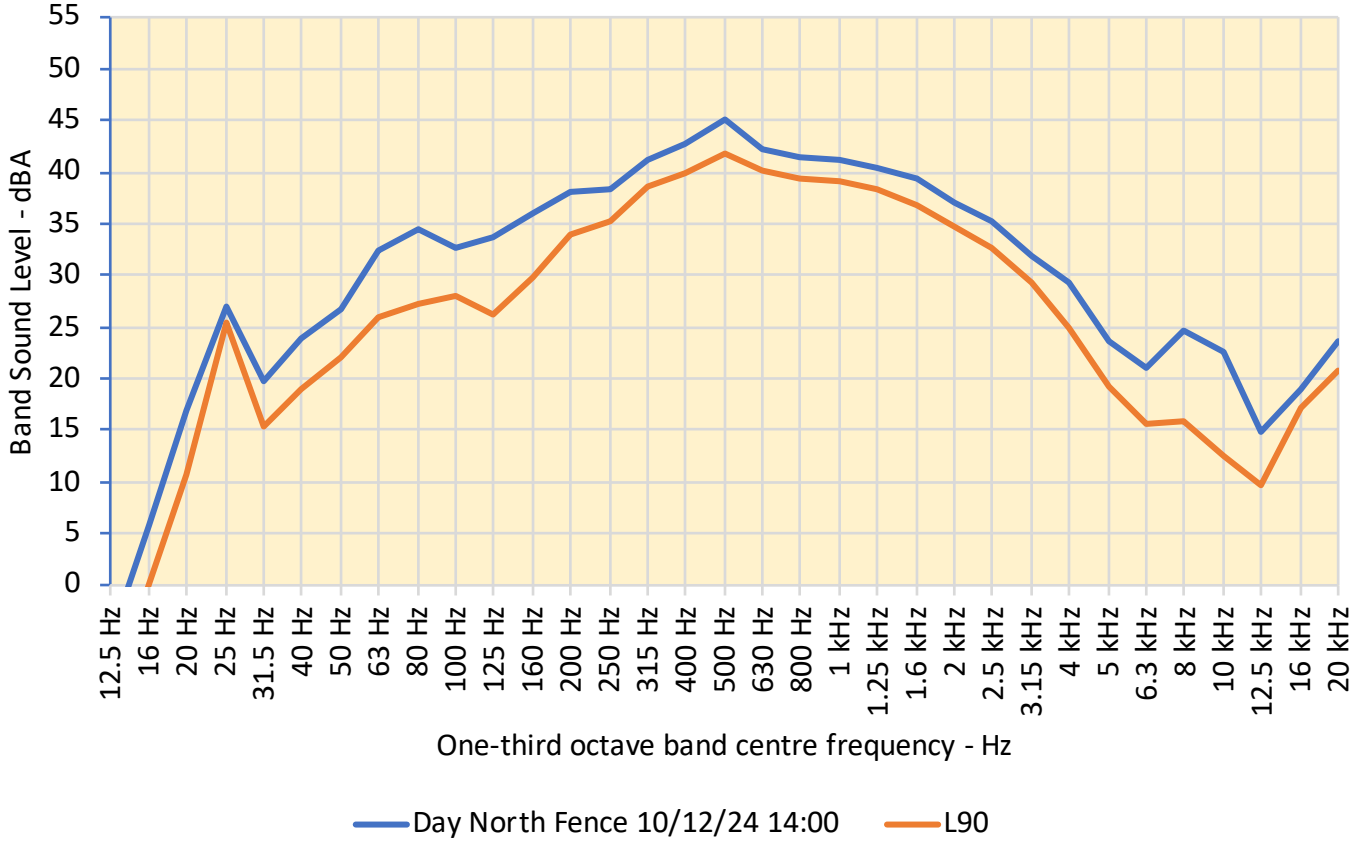

Figure A30: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring North Fence Daytime 11/12/24

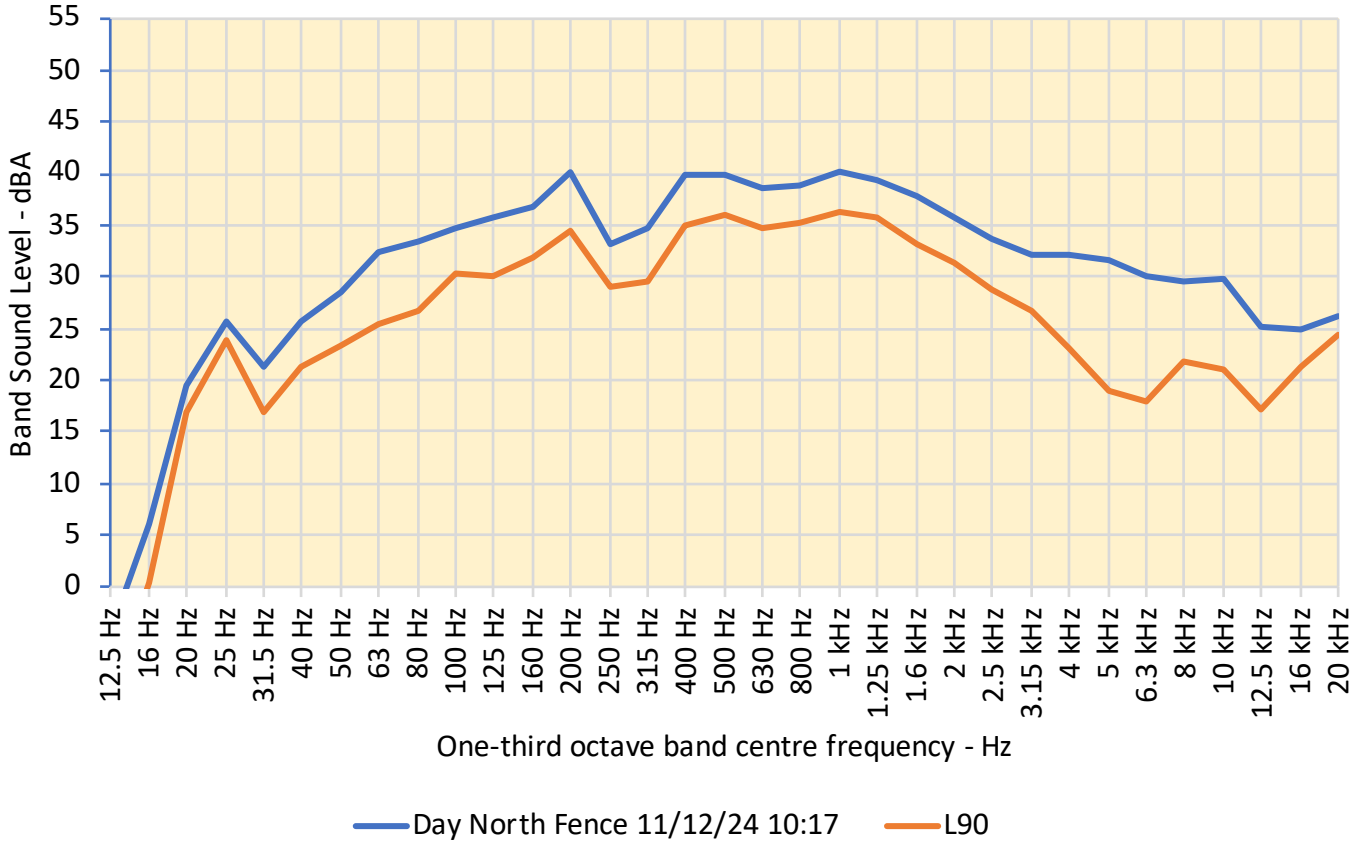

Figure A31: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LAeq spectra for Location 20 measurements

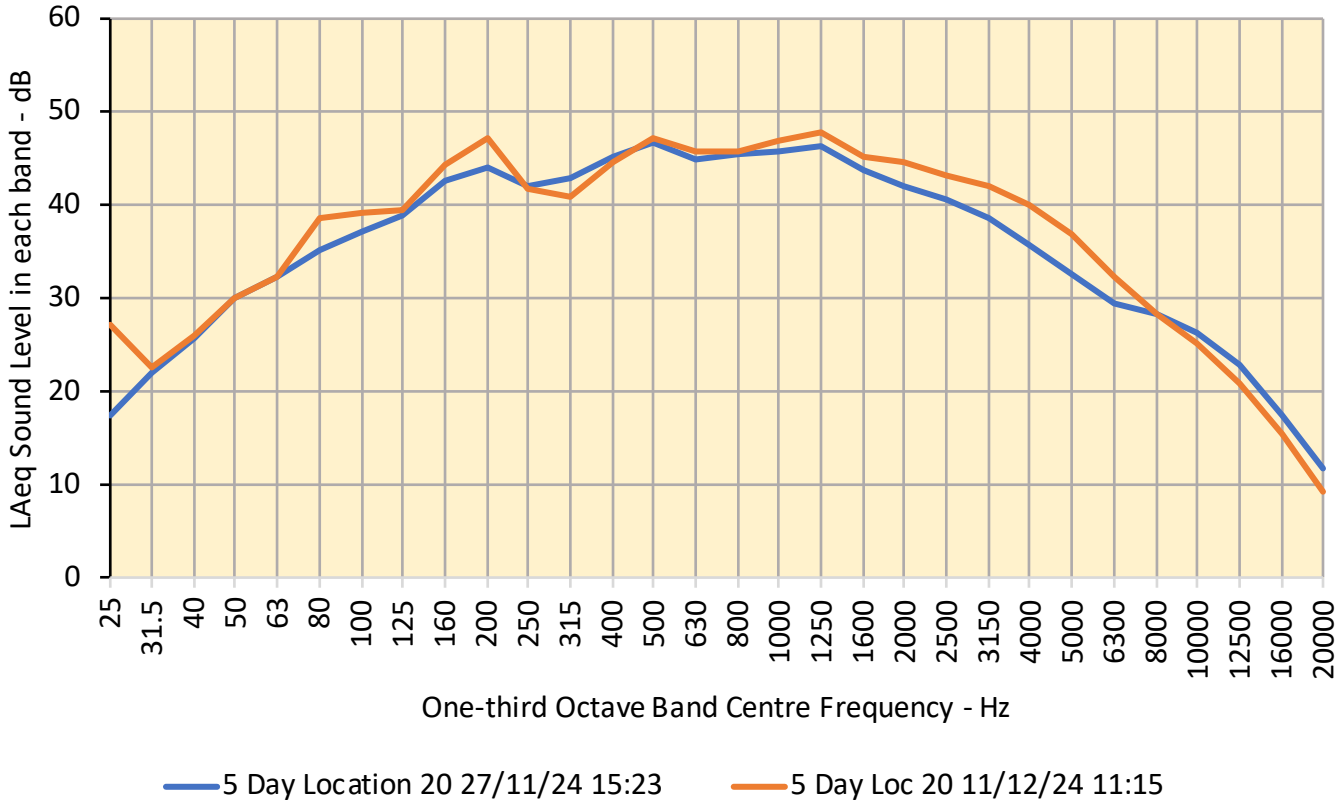

Figure A31A: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LAeq Tonality spectra for Location 20 measurements

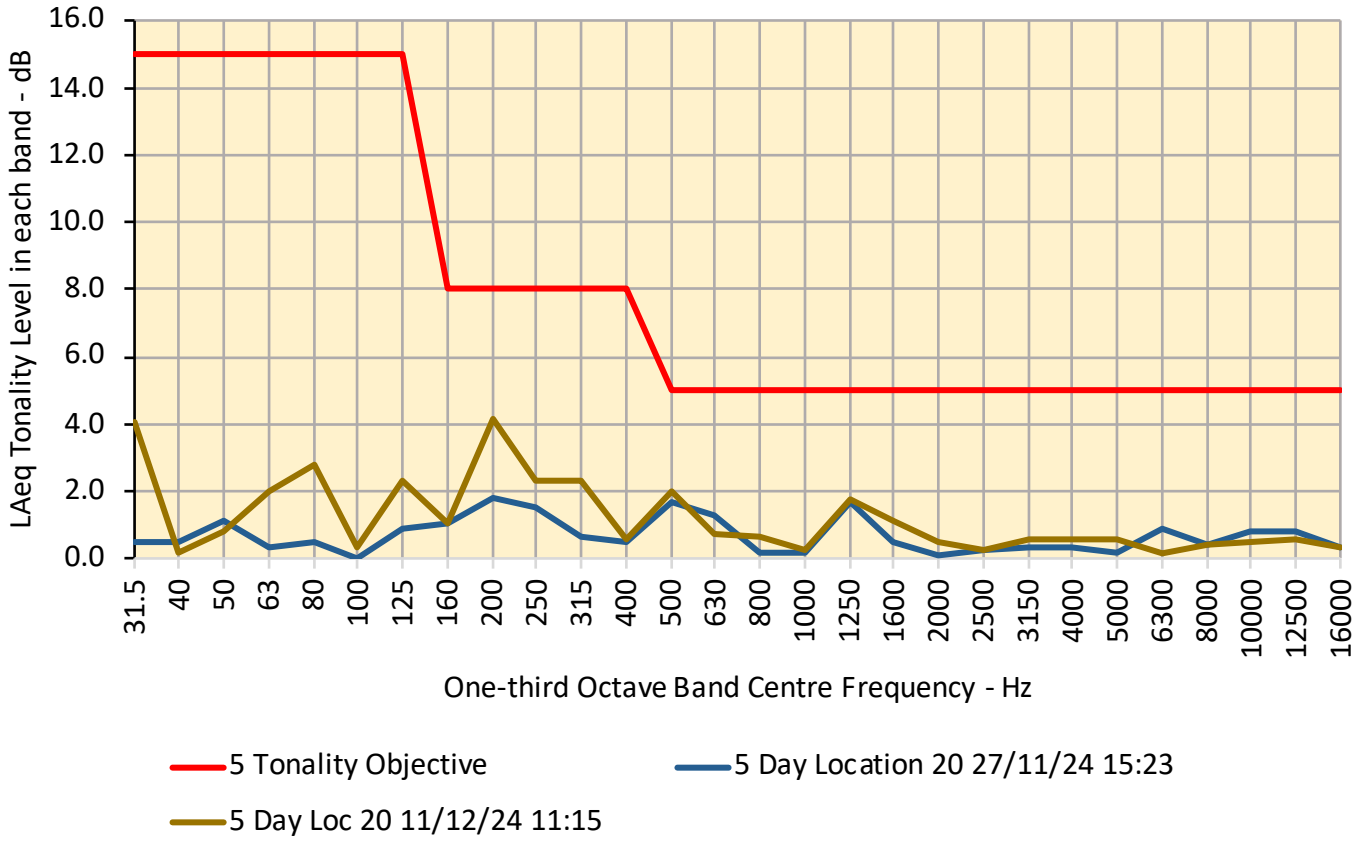

Figure A32: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LA90 spectra for Location 20 measurements

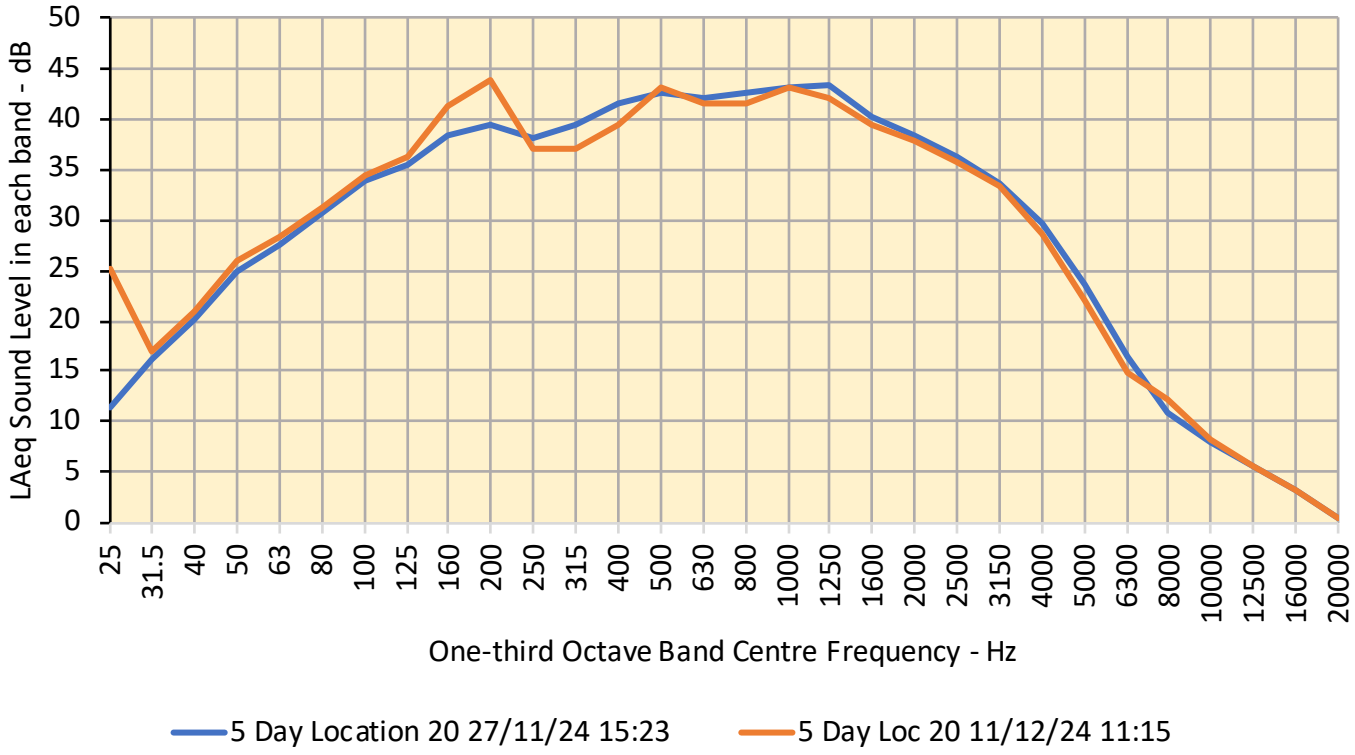

Figure A32A: Boral Cement Berrima Annual Environmental Noise 2024 - One-third octave band LA90 Tonality spectra for Location 20 measurements

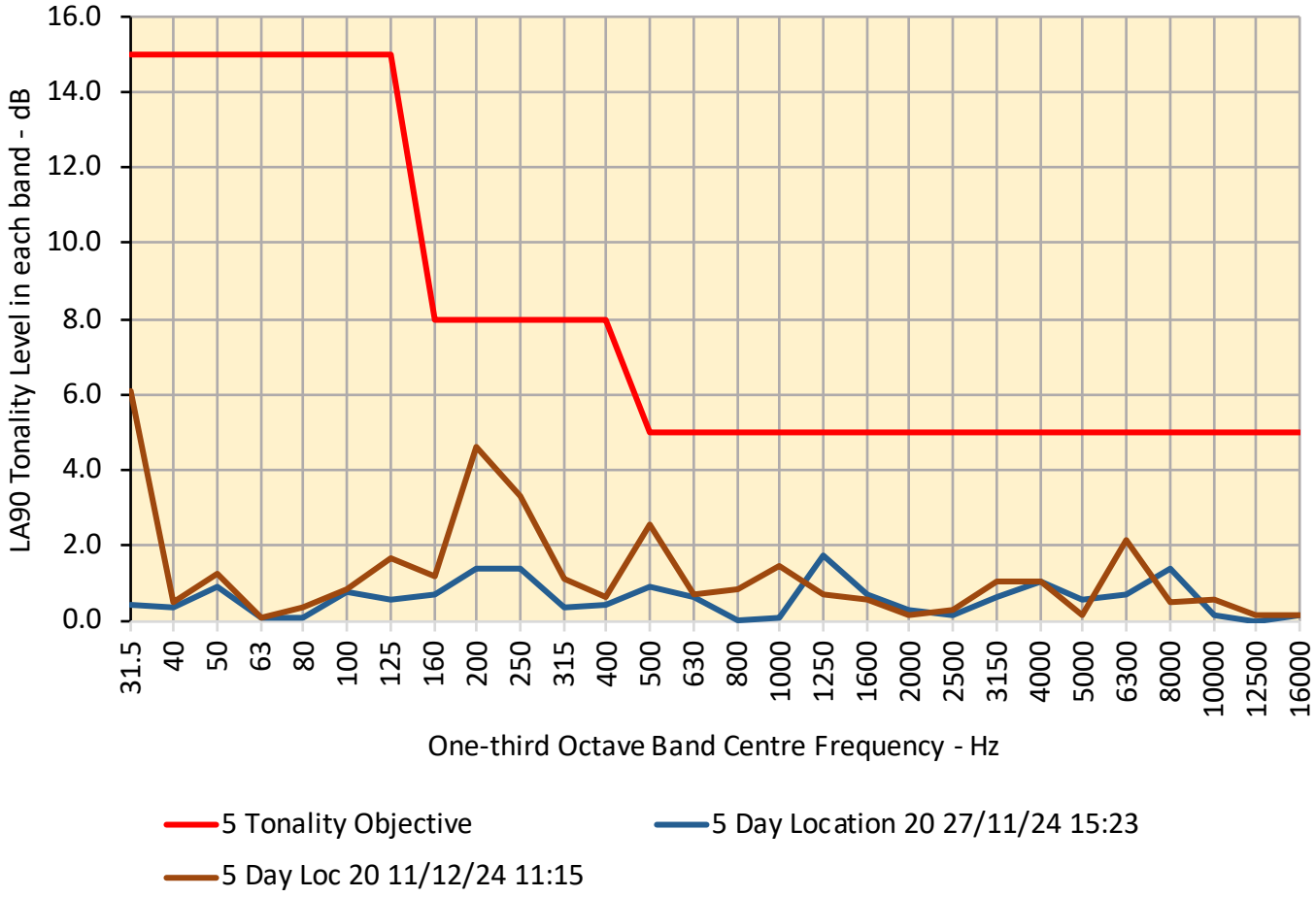

Figure A33: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring Location 20 Daytime 27/11/24

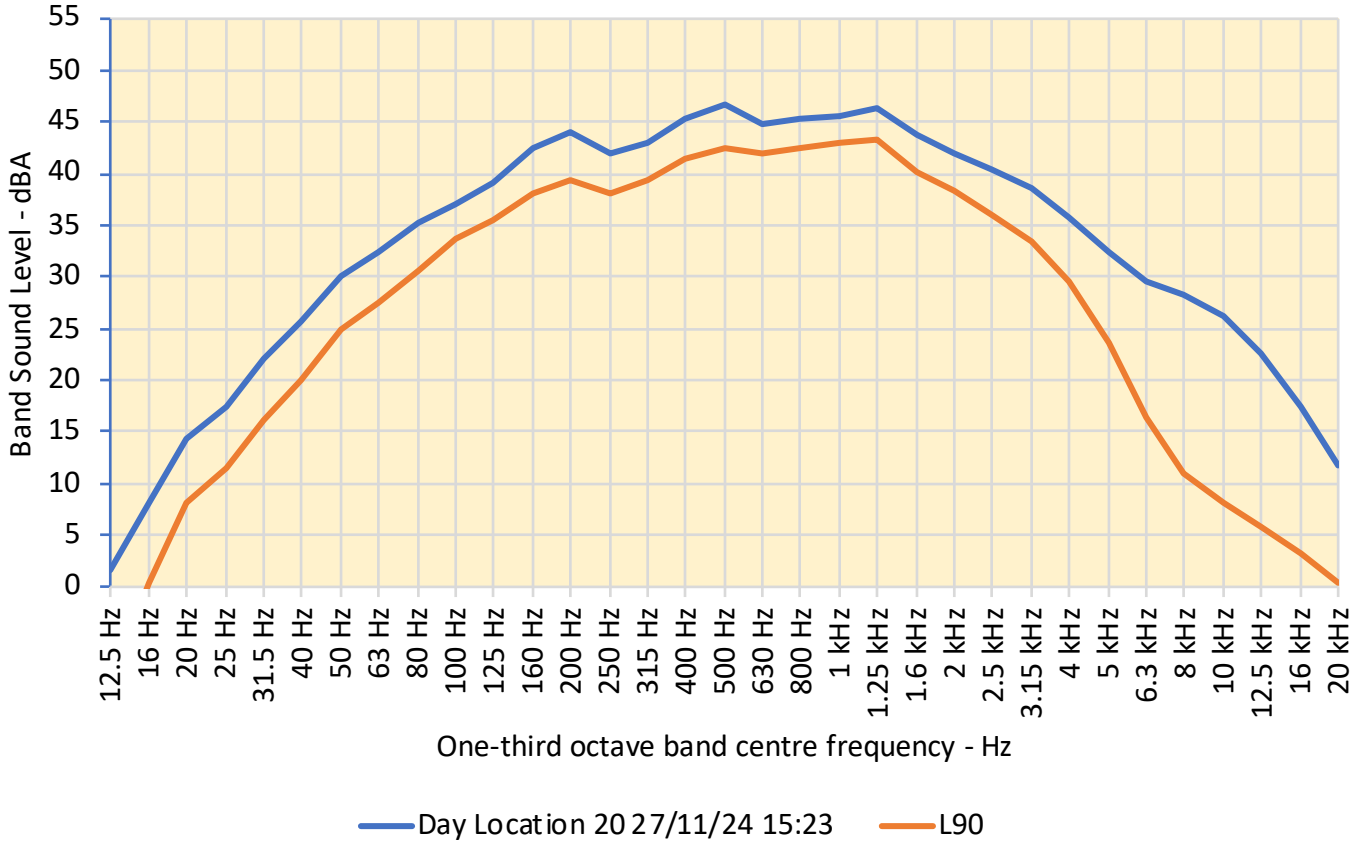

Figure A34: Boral Cement Berrima Annual Environmental Noise 2024
Attended monitoring Location 20 Daytime 11/12/24

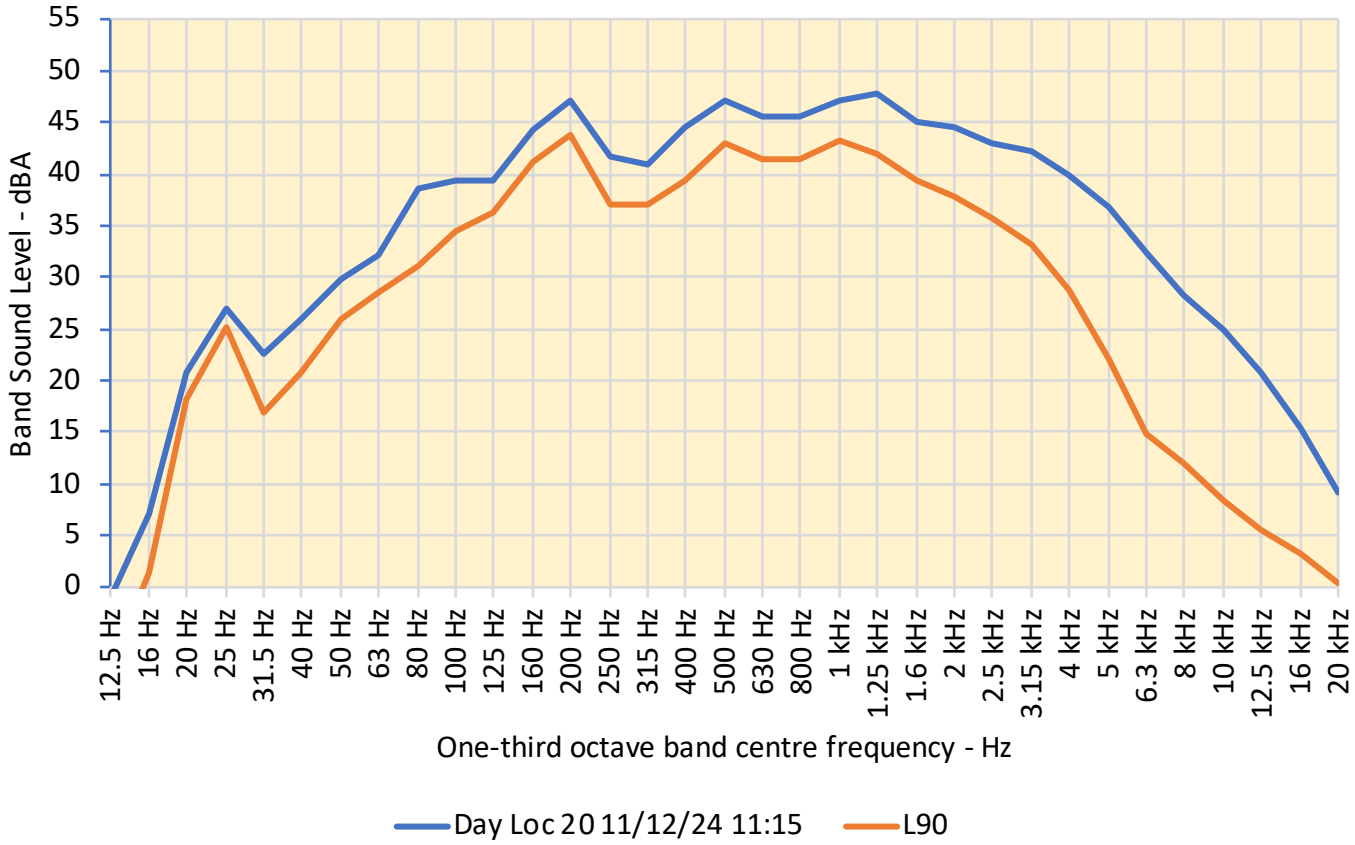

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Figure A35: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Night 28/11/24

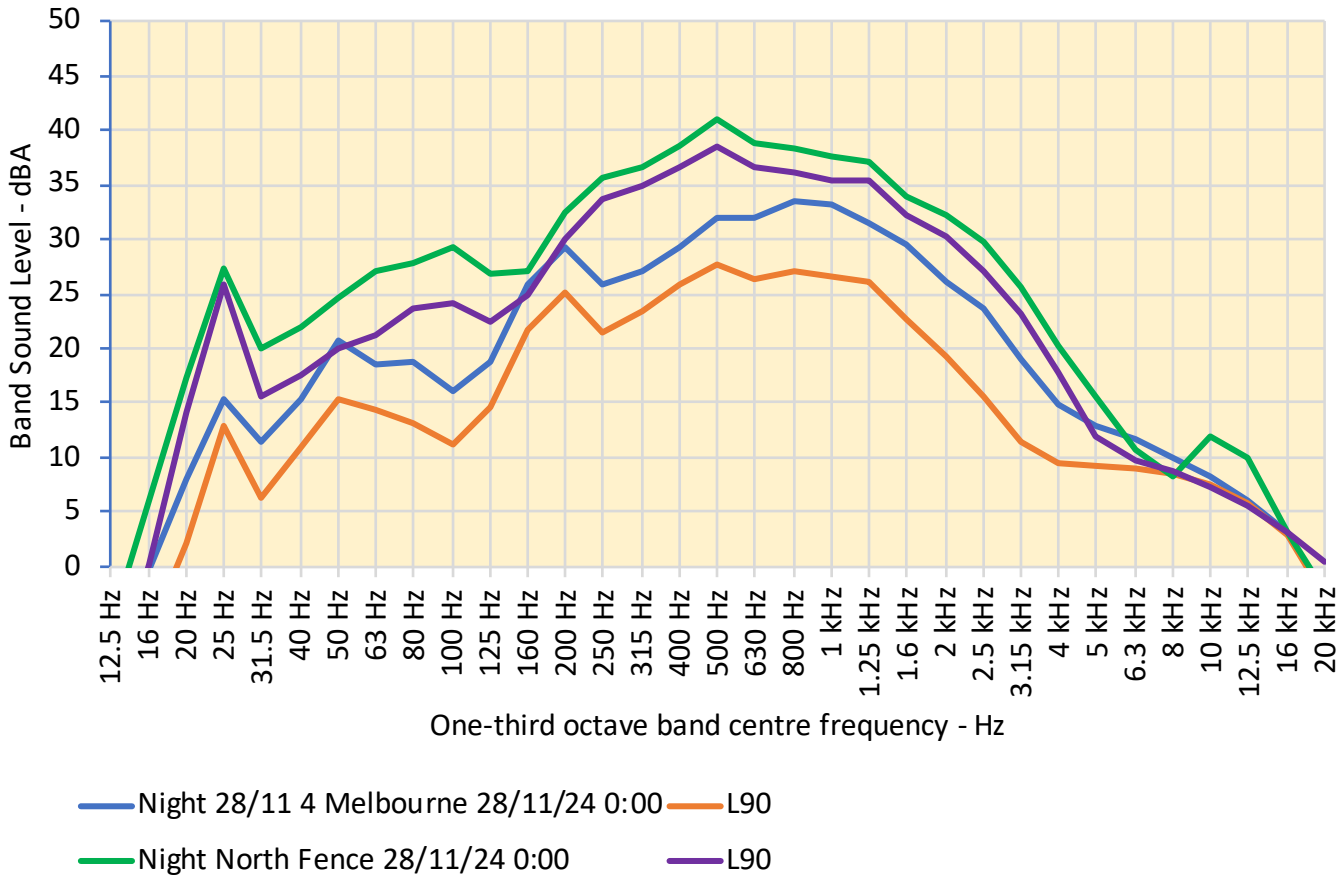

Figure A36: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Night 2/12/24

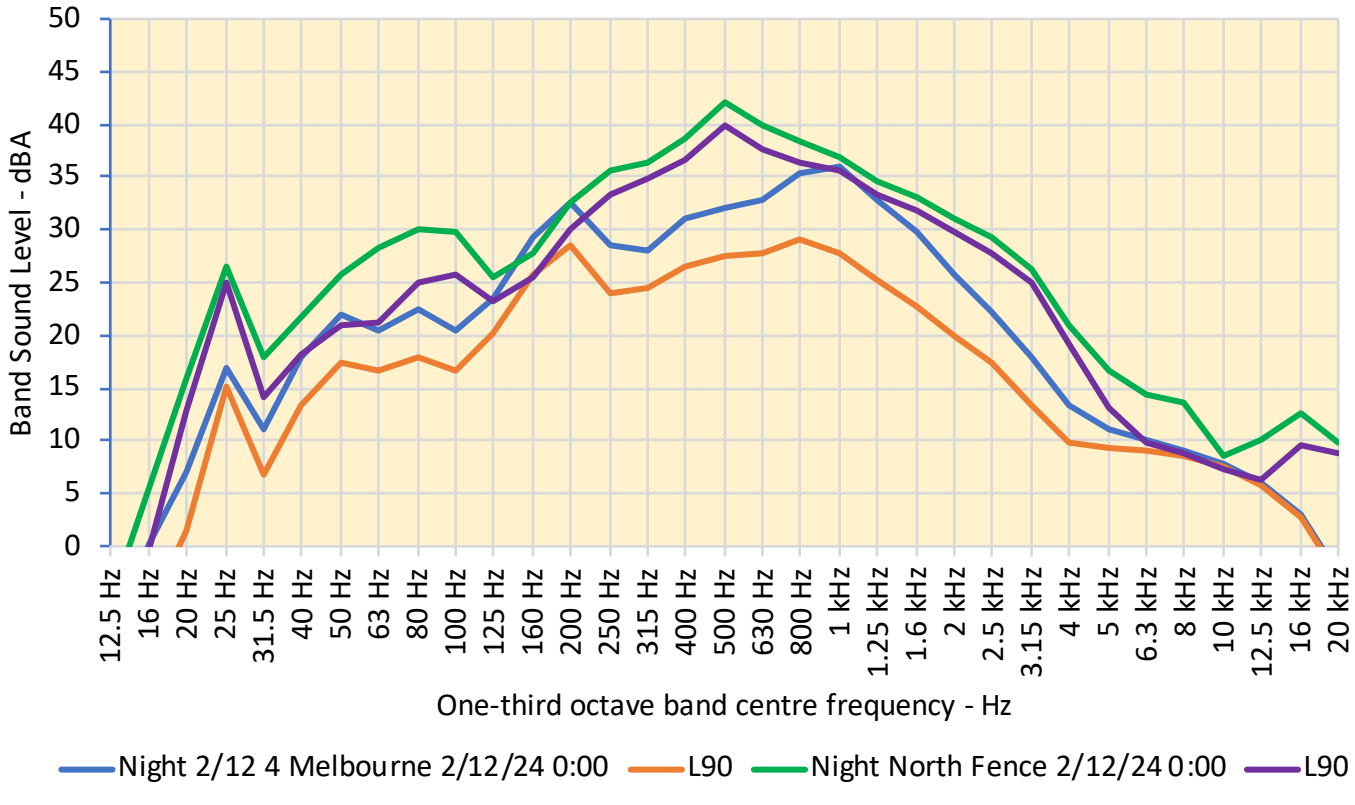

Figure A37: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Night 4/12/24

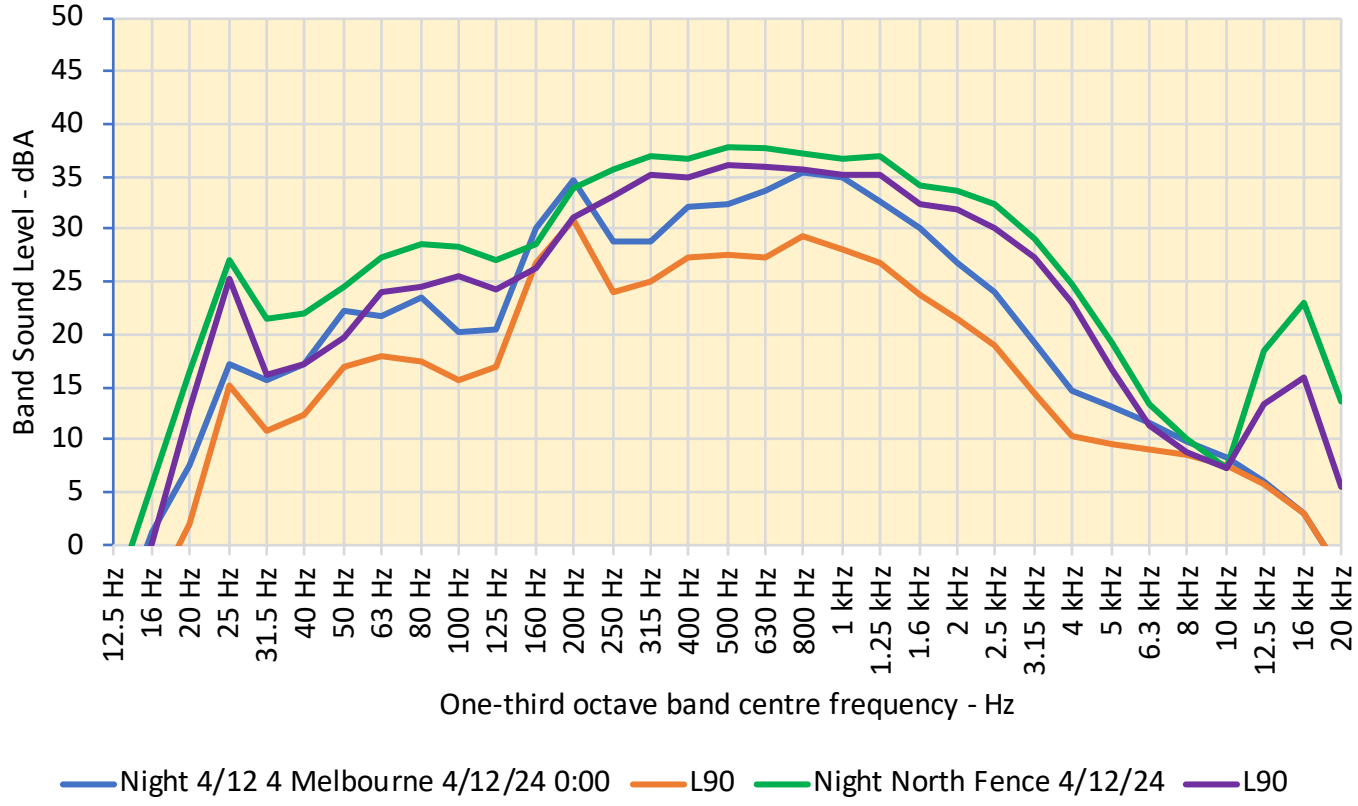

Figure A38: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Night 10/12/24

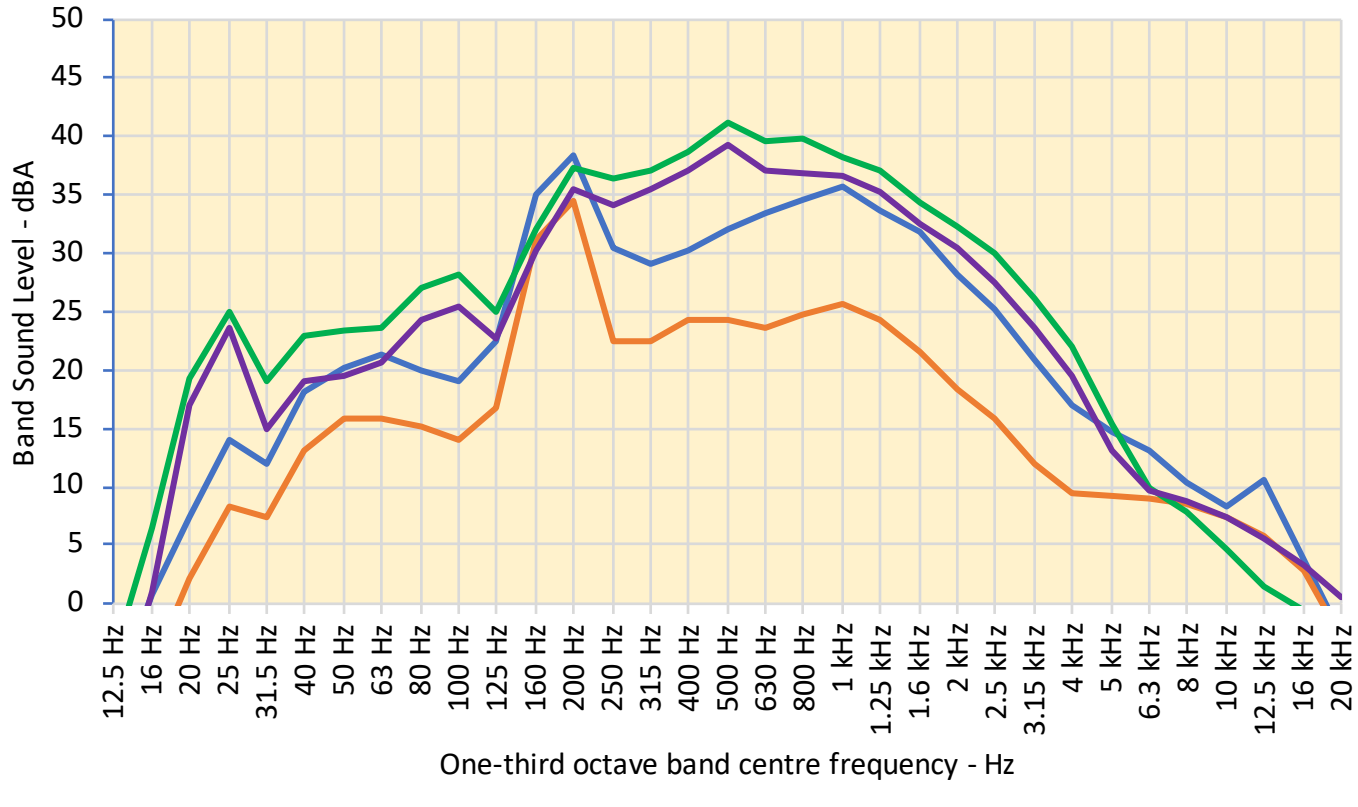

Figure A39: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Evening 28/11/24

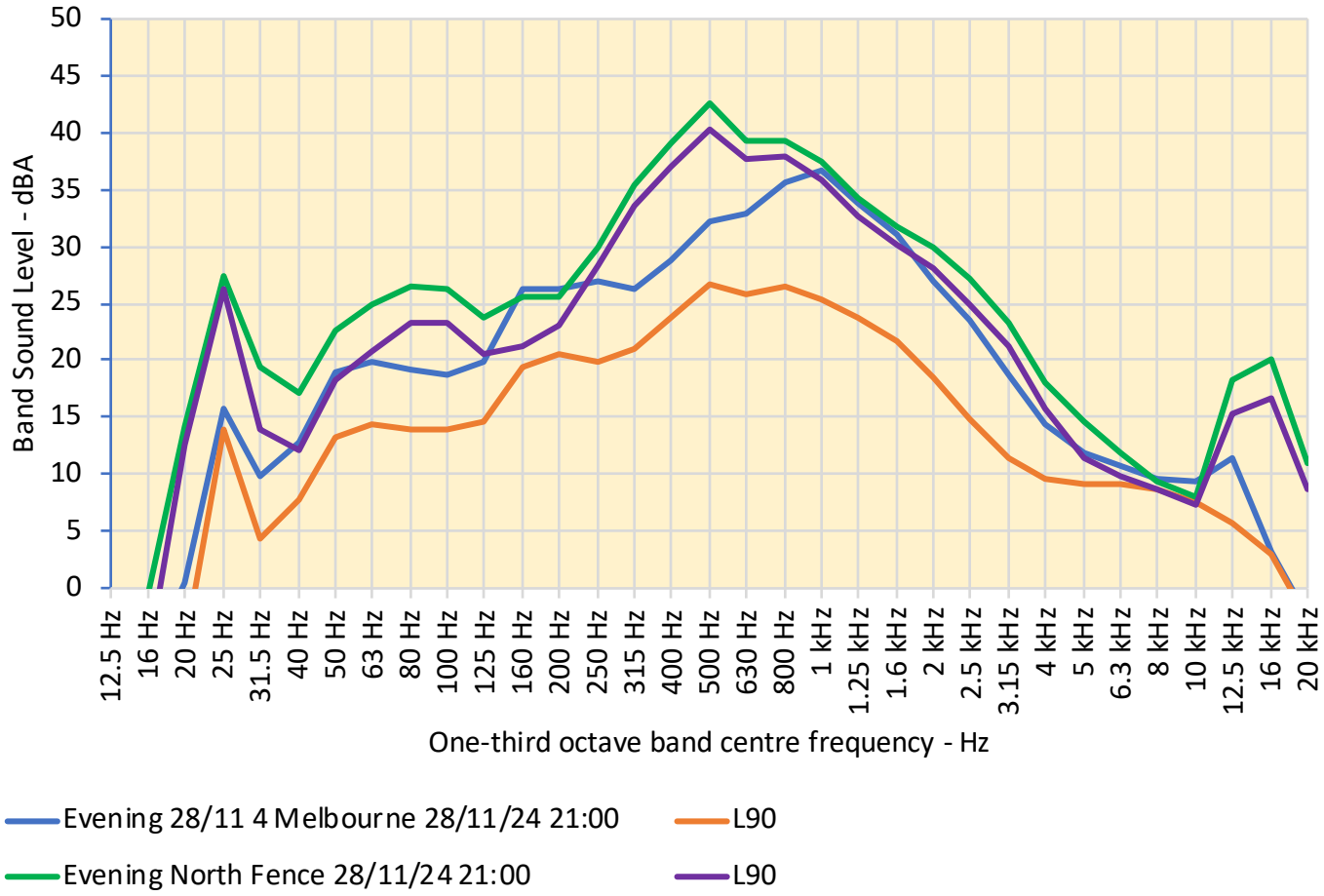

Figure A40: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Evening 4/12/24

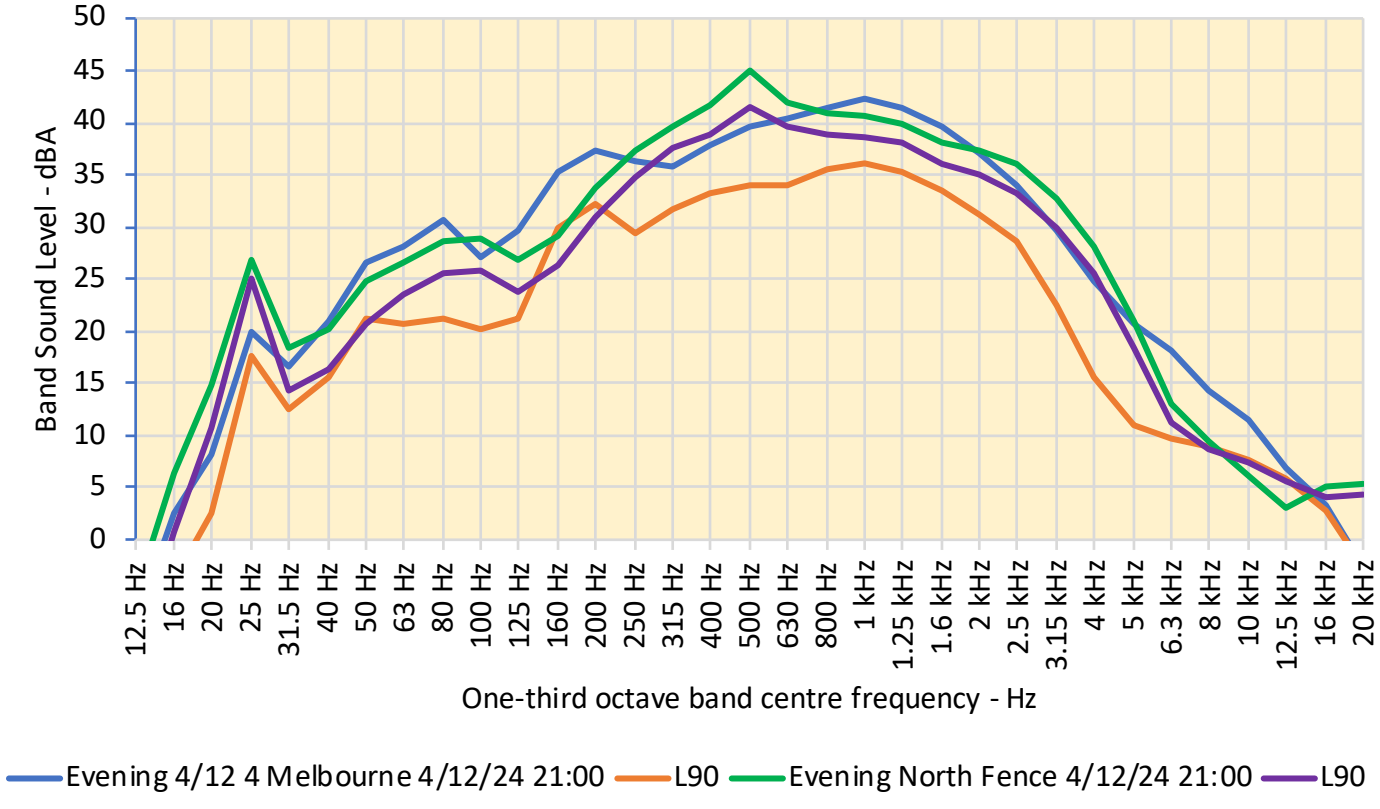

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Figure A41: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Evening 10/12/24

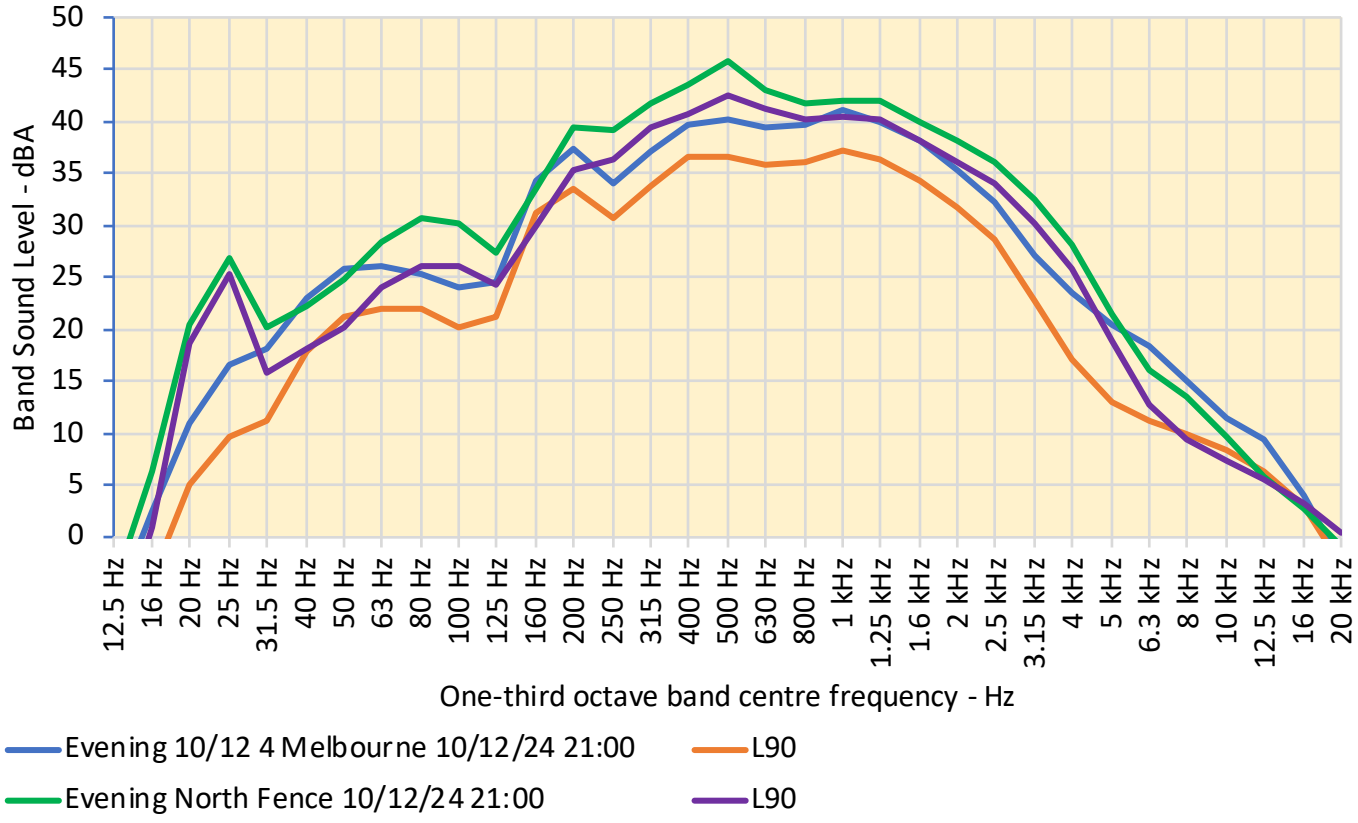

Figure A42: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Day 6/12/24

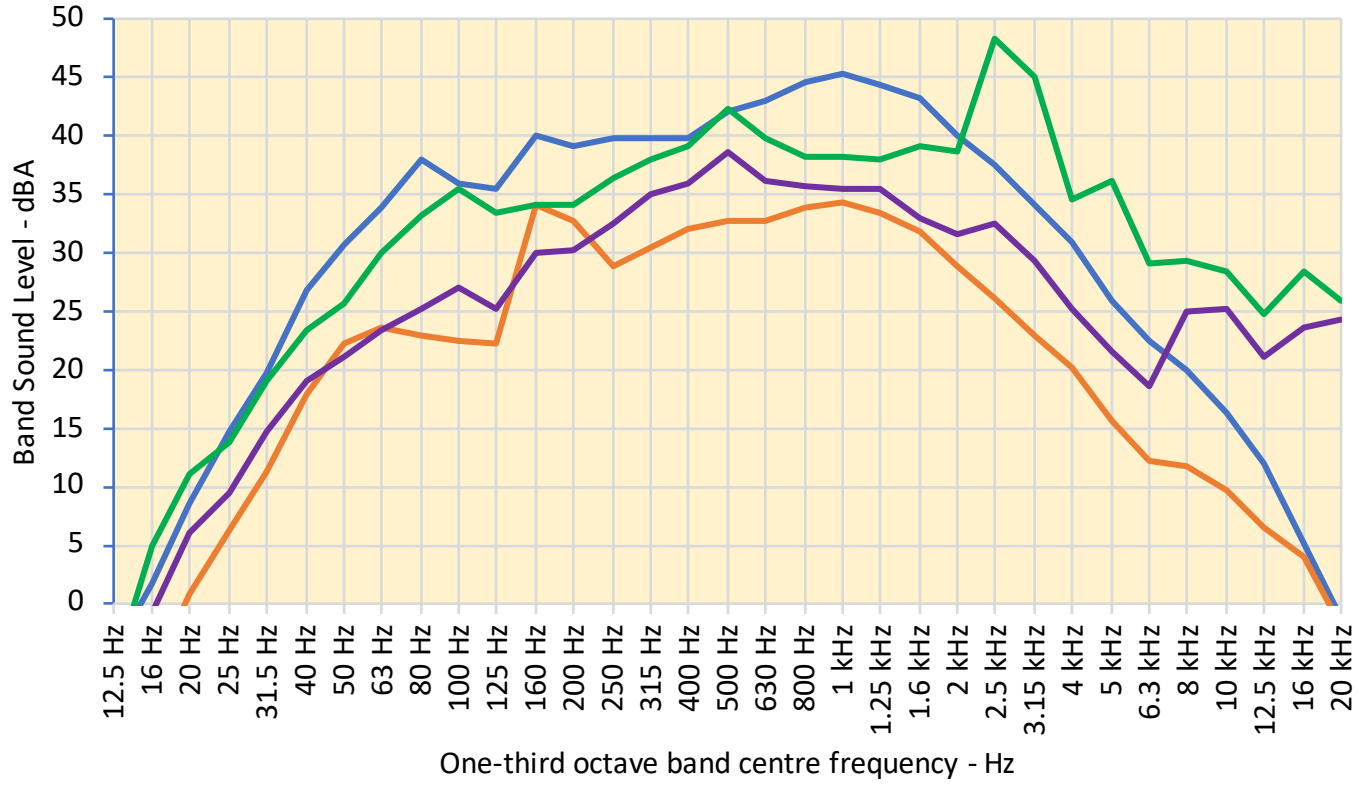

Figure A43: Boral Cement Berrima Annual Environmental Noise 2024
Compare 4 Melbourne St & North Fence Day 10/12/24

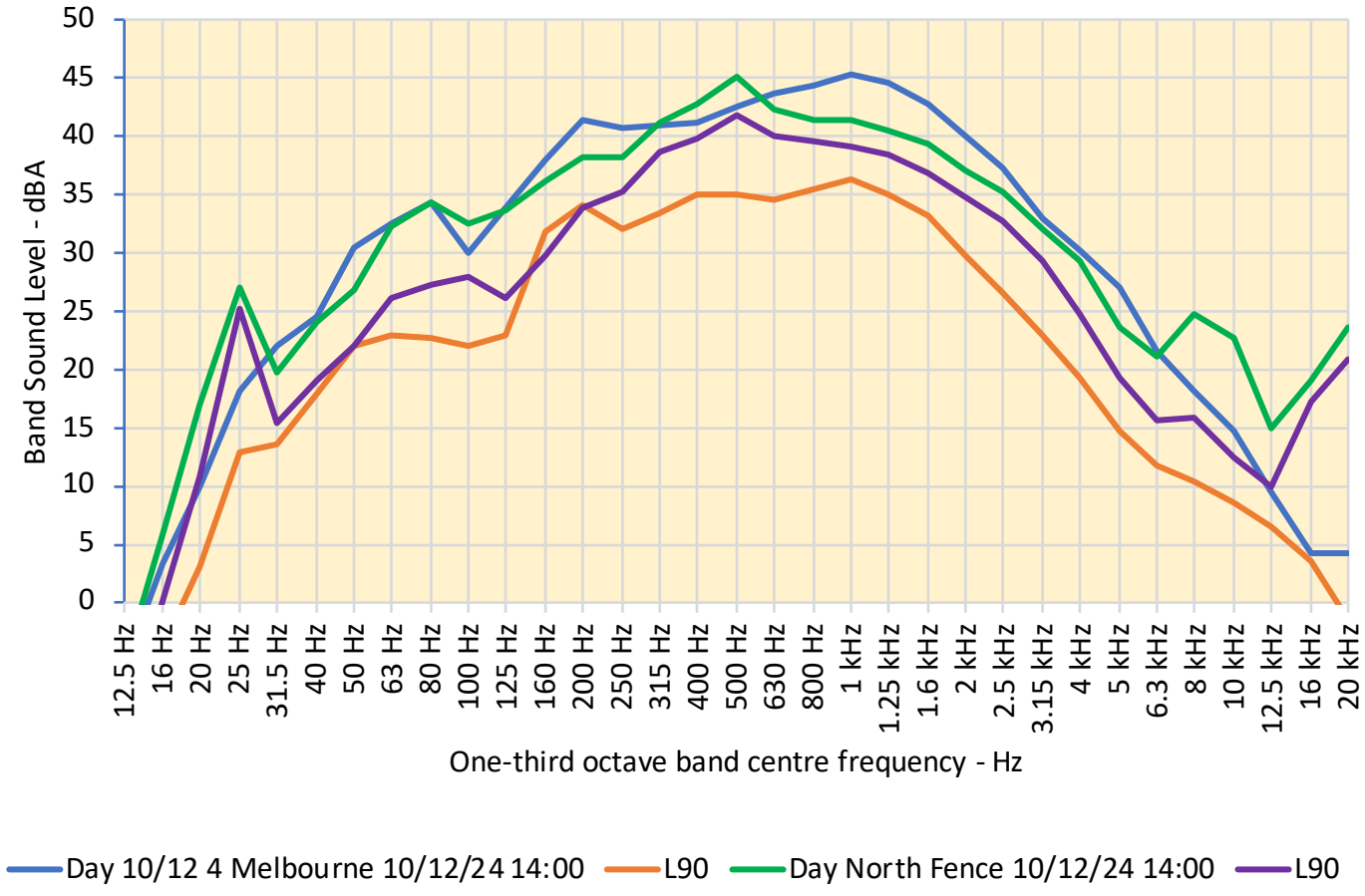

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Figure A44: Boral Cement Berrima Annual Environmental Noise 2024
Plant source monitoring RM6 2024

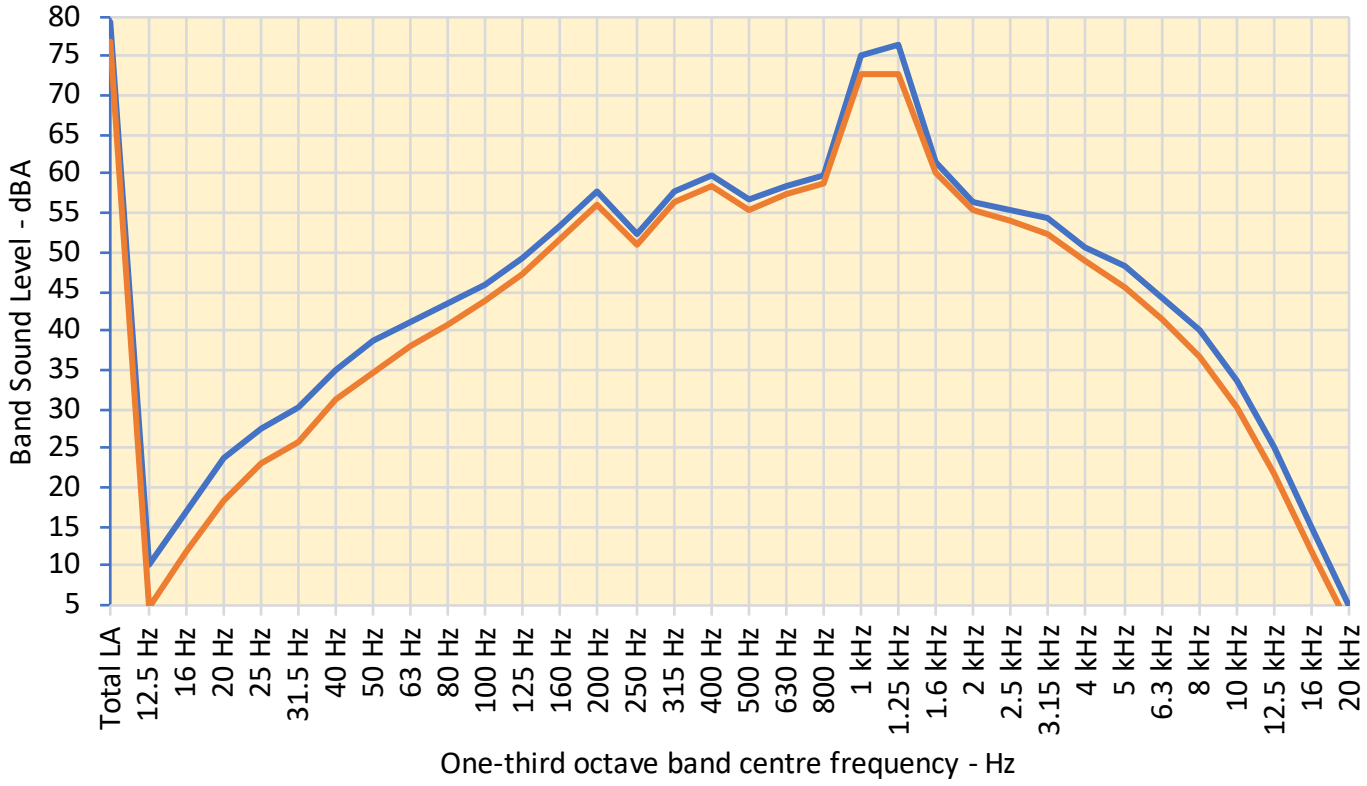
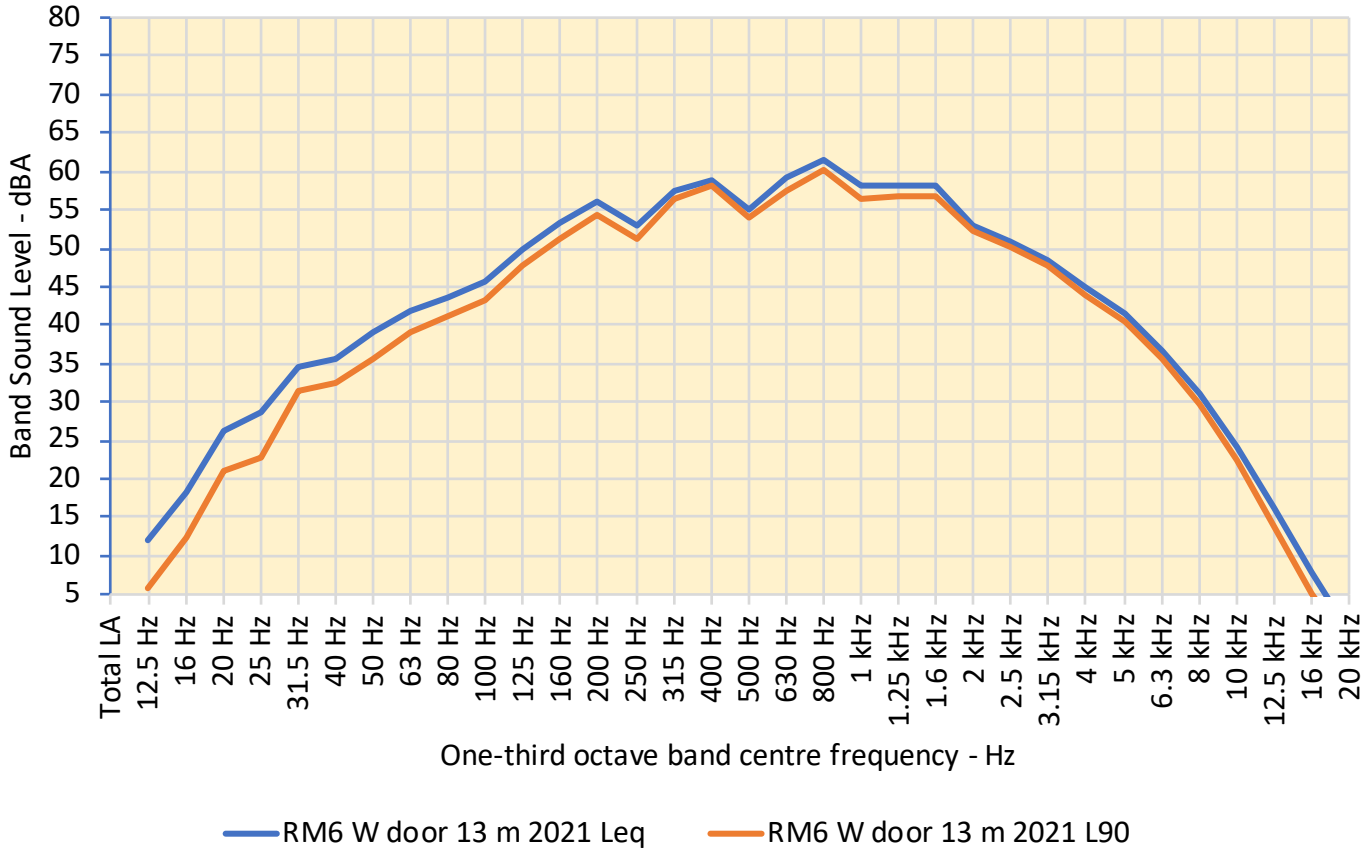


Figure A45: Boral Cement Berrima Annual Environmental Noise 2024
Plant source monitoring RM6 2021



Copy with table of summary NA28 data 2024 Berrima 11122024.xlsx

ABN: 25 153 946 064
ACN: 153 946 064

Appendix B: Unattended environmental sound level results for 4 Melbourne Street

4 Melbourne St - New Berrima

Daytime LAEQ **27 November to 11 December 2024**

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
7:00		54	53	52	56	55	53	56	55	55	50	48	53	53			56	48	53	2.2
7:15		56	55	55	55	55	53	55	54	55	48	46	54	56			56	46	54	2.9
7:30		53	52	53	50	53	52	56	53	54	48	45	57	55			57	45	52	3.2
7:45		52	61	48	57	53	52	60	55	54	55	49	57	54			61	48	54	3.9
8:00		54	54		53	56	54	55	54	53	49	49	55	55			56	49	53	2.4
8:15		52	54	48	47	54	53	53	52	55	52	50	54	56			56	47	52	2.7
8:30		53	56	51	51	54	53	56	54	58	49	48	55	53			58	48	53	3.0
8:45		53	55	52	50	54	54	55	53	53	54	48	53	53			55	48	53	2.0
9:00		52	54	50	52	53	54	54	53	53	48	48	54	55			55	48	52	2.4
9:15		53	53	53	48	52	54	53	54	53	48	51	55	56			56	48	53	2.3
9:30		52	54		49	51	54	54	54	55	48	50	52	53			55	48	52	2.4
9:45		52	55	50	48	53	51	54	51	51	48		50	53			55	48	51	1.9
10:00		53	53	49	48	50	51	53	52	51	52	50	51	53			53	48	51	1.7
10:15		52	53	51	48	50	52	53	53	53	50	49	53	55			55	48	52	1.9
10:30		53	52	54	49	49	52	53	51	53	49	49	53	53			54	49	51	1.9
10:45		52	52		57	53	51	53	52	53		50	51	54			57	50	52	1.8
11:00		52	53	52	50	51	52	53	52	54	49	50	51	54			54	49	52	1.4
11:15		52	53	51	49	54	53	54	54	56		51	52	54			56	49	53	1.9
11:30		52	58	52	49	52	51	52	51	58	52	48	52	53			58	48	52	2.7
11:45		53	52	51		53	51	54	55	56	65	49	52	54			65	49	54	4.0
12:00		54		51		55	54	53	52	54	55	50	52	53			55	50	53	1.6
12:15		51	53	53	50	52	52	54	54	54	50	49	53	53			54	49	52	1.7
12:30		51			52	53	53	54	54	54	50	49	51	54			54	49	52	1.7
12:45		53		51	51	50		53	53	52	51	49	52	54			54	49	52	1.5
13:00		52		52	65	50	52	53	54	53	51	49	51	52			65	49	53	4.0
13:15		52		51	61	50	53	53	51	56	51	49	51	54			61	49	53	3.3
13:30	51	51			51	51	53	53	55	58	50	50	53	51			58	50	52	2.2
13:45	50	53		50	49	53	53	53	53	53	53	49	52	54			54	49	52	1.9
14:00	53	54	55	51	48	52	55	52	52	54	50	49	51	54			55	48	52	2.2
14:15	54		57	51	48	51	54	52	55	54	50	49	51	53			57	48	52	2.5
14:30	53	55	55		49	53		64	53	53	48	50	52	55			64	48	53	4.0
14:45	52	55		52	51	53		53	52	54	48	52	52	55			55	48	52	1.9
15:00	52	56		51		51		54	51	52	47	51	54	54			56	47	52	2.3
15:15	52		57	50	48	52	53	53	52	52	49	51	53	54			57	48	52	2.3
15:30	53				53	51	54	53	53	51	56	51	53	55			56	51	53	1.5
15:45	57	54	54	50	48	53	56	54	53	52	50	50	50	54			57	48	53	2.6
16:00	55	56			54	52	59	53	51	51	50	49	51	53			59	49	53	2.9
16:15	52	56	54	50	58	50		53	50	51	49	51	54	54			58	49	52	2.6
16:30	53	67	54	50	50	51	54	54	51	49	50	50	54	53			67	49	53	4.6
16:45	55	59			49	52		53	50	48	47	49	54	52			59	47	52	3.4
17:00	58	54	54		49	50	52	53	50	50	47	51	54	52			58	47	52	2.9
17:15	53	58	54	50	50	50	52	52	51	51	48	52	55	53			58	48	52	2.5
17:30	52	56	55		48	51	54	53	50	51	48	49	53	52			56	48	52	2.5
17:45	51	55	54	51	48	49	55	52	49	49	49	50	52	53			55	48	51	2.2
18:00	50	50	53	55	46	50	54	53	48	50	47	52	49	53			55	46	51	2.5
Max	58	67	61	55	65	56	59	64	55	58	65	52	57	56			67	52	59	4.5
Min	50	50	52	48	46	49	51	52	48	48	47	45	49	51			52	45	49	2.1
Ave	53	54	54	51	51	52	53	54	52	53	50	49	53	54			54	49	52	1.5
SD	2.1	2.9	1.9	1.6	4.0	1.7	1.6	2.1	1.6	2.3	3.2	1.4	1.7	1.1			4.0	1.1	2.1	0.8
E Ave	53	56	55	51	54	52	53	55	53	54	53	50	53	54			56	50	53	1.5

Evening LAEQ

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
18:00	50	50	53	55	46	50	54	53	48	50	47	52	49	53			55	46	51	2.5
18:15	50	50	54	53	48	50	51	51	48	49		50	52	51			54	48	50	1.8
18:30	53	49	52	50	46	47	60	54	48	49		52	48	54			60	46	51	3.7
18:45	50	46		52	47	49	54	56	49	49		54	49	50			56	46	51	2.9
19:00	49	50	51	48	46	46	50	55	49		49	48	49	50			55	46	49	2.2
19:15		47			46	47	48	54	48	52	48	49	54	51			54	46	49	3.0
19:30	49	45	51	52	52	45	47	52	44		55	49	52	49			55	44	49	3.3
19:45	48	45	50	52	48	46	46	55	52	51	55	48	48	49			55	45	50	3.2
20:00	47	46	51	47	46	49	48	49	44	51	55	48	47	50			55	44	48	2.7
20:15	50	47	51	46	46	49	48	50	46	55	51	47	45	51			55	45	49	2.8
20:30	49	47	50		50	51	48	49	56	53	51	45	45	48			56	45	49	3.2
20:45	49	45	50	47	46	49	48	49	56	52	47	44	47	50			56	44	48	3.0
21:00	44	43	48	47	43	42	50	50	43	48	44	43	45	50			50	42	46	3.0
21:15	46	47	49	46	44	44	46	48	46	48	46	44	42	50			50	42	46	2.2
21:30	49	45	48	44	43	47	44	50	47	47	45	44	46	50			50	43	46	2.2
21:45	45	44	47	44	42	47	45	49	47	46	45	45	43	49			49	42	46	2.1
22:00	44	45	47	44	43	45	45	48	46	47	44	41	45	48			48	41	45	1.9
Max	53	50	54	55	52	51	60	56	56	55	55	54	54	54			60	50	54	2.5
Min	44	43	47	44	42	42	44	48	43	46	44	41	42	48			48	41	44	2.2
Ave	48	46	50	48	46	47	49	51	48	50	49	47	47	50			51	46	48	1.5
SD	2.5	2.2	2.1	3.5	2.7	2.2	4.0	2.8	3.7	2.6	4.1	3.5	3.3	1.4			4.1	1.4	2.9	0.8
E Avg	49	47	50	50	47	48	51	52	50	50	51	49	49	50			52	47	49	1.6

Night LAEQ

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
22:00	44	45	47	44	43	45	45	48	46	47	44	41	45	48			48	41	45	1.9
22:15	46	42			43	45	42	49	43	46	46	42	45	49			49	42	45	2.4
22:30	45	44	47	42	40	42	45	46	44	48	45	43	41	48			48	40	44	2.4
22:45		43		43	41	43	44	47	43	47	44	44	43	47			47	41	44	2.0
23:00	46	48		43	43	43	43	44	41	47	47	43	48	47			48	41	45	2.3
23:15	43	44		50	40	46	43	47	42	47	44	45	43				50	40	44	2.7
23:30	41	43		49	39	43	44	46	41	45	44	46	44				49	39	44	2.6
23:45	42	45		43	43	40	46	46	42	47	45	46	46				47	40	44	2.2
0:00	41	45		44	43	43	43	46	41	43	44	45	45	47			47	41	44	1.6
0:15	40	47		41	41	45	47	46	40	46	44	44	44	47			47	40	44	2.7
0:30	40	46	60	42	40	42	46	51	42	48	45	44	43	47			60	40	45	5.2
0:45	42	46		41	40	43	43	44	47	47	46	44	45	47			47	40	44	2.3
1:00	40	44		40	40	43	50	43	42	51	44	44	43	46			51	40	44	3.4
1:15	40	44		39	40	41	42	41	41	48	44	43	43	46			48	39	42	2.6
1:30	41	44		39	43	41	48	43	46	46	44	44	44	46			48	39	44	2.4
1:45	43	47	47	38	41	46	46	44	42	46	43	45	43				47	38	44	2.5
2:00	41	48	53	39	42	45	48	44	43	44	43	44	46				53	39	45	3.6
2:15	42	46	53	40	44	44	45	40	46	44	43	43	44				53	40	44	3.3
2:30	43	46		41	42	45	43	43	41	46	43	42	45				46	41	43	1.6
2:45	43	46	46	39	43	40	45	40	45	47	44	44	46				47	39	44	2.5
3:00	46	47		39	43	43	45	43	41		43	44	44				47	39	44	2.2
3:15	42	45	45	39	44	43	45	43	46	47	44	44	45				47	39	44	2.0
3:30	44	45	45	39	46	43	46	42	43	45	43	45	45				46	39	44	2.1
3:45	47	50	44	40	45	45	44	46	49	43	43	47	46				50	40	45	2.7
4:00	47	49		39	49	47	45	43	45	43	43	48	49				49	39	46	3.0
4:15	44	47		39	47	46	49	47	47	43	44	47	49				49	39	46	2.8
4:30	50	49		39	48	45	48	48	50	45	44	50	49				50	39	47	3.3
4:45	52	50		40	48	49	50	48	50	46	44	48	48				52	40	48	3.3
5:00	48	49	47	43	48	48	49	49	50	47	44	48	48				50	43	48	2.0
5:15	50	52		46	51	51	53	49	50	48	45	51	50				53	45	50	2.4
5:30	49	51	51	48	52	51	53	50	52	47	46	52	51				53	46	50	2.1
5:45	50	50		51	51	50	50	51	51	48	46	49	51				51	46	50	1.5
6:00	51	53	54	45	52	55	53	51	54	46	46	51	53				55	45	51	3.3
6:15	52	54	48	50	53	52	53	52	50	49	60	52	54				60	48	52	3.1
6:30	53	53	51	48	57	55	52	53	54	51	46	53	54				57	46	52	2.9
6:45	54	54		47	55	53	54	56	53	50	46	53	54				56	46	52	3.2
7:00	54	53	52	56	55	53	56	55	55	50	48	53	53				56	48	53	2.2
Max	54	54	60	56	57	55	56	56	55	51	60	53	54	49			60	49	55	3.2
Min	40	42	44	38	39	40	42	40	40	43	43	41	41	46			46	38	42	2.0
Ave	45	47	49	43	45	46	47	47	46	47	45	46	47	47			49	43	46	1.5
SD	4.4	3.4	4.3	4.4	5.0	4.1	3.8	3.9	4.3	2.1	2.9	3.4	3.6	1.0			5.0	1.0	3.6	1.1
E Avg	48	49	52	46	48	48	49	48	48	47	48	48	48	47			52	46	48	1.4
24hr	51	53	53	51	51	51	51	53	51	52	51	49	51	52	46		53	46	51	1.7

Berrima Melbourne Dec24 A criteria ver2: LAEQ

4 Melbourne St - New Berrima

Daytime LA90 **27 November to 11 December 2024**

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	*Maximum*	*Minimum*	*Average*	*SD*
7:00		44	44	45	40	43	43	47	42	44	41	42	43	44			47	40	43	1.9
7:15		42	44	42	40	43	41	47	40	44	42	42	43	45			47	40	43	2.1
7:30		43	44	41	40	42	42	48	39	44	40	41	42	45			48	39	42	2.6
7:45		42	45	42	41	42	41	48	40	46	40	41	43	45			48	40	43	2.6
8:00		43	44		40	42	43	48	40	45	41	42	43	45			48	40	43	2.2
8:15		42	45	42	39	43	44	47	41	45	39	42	42	45			47	39	43	2.4
8:30		41	45	43	39	42	44	48	40	42	40	42	39	44			48	39	42	2.6
8:45		42	44	42	39	42	43	47	40	39	40	43	38	44			47	38	42	2.5
9:00		42	43	44	39	42	41	47	40	40	41	43	39	43			47	39	42	2.3
9:15		41	42	45	39	41	41	47	40	37	41	44	38	44			47	37	42	2.8
9:30		41	42		38	41	42	47	41	40	41	44	36	42			47	36	41	2.7
9:45		41	41	42	40	41	41	46	40	40	41		36	43			46	36	41	2.2
10:00		42	43	40	41	40	41	46	39	40	41	45	39	45			46	39	42	2.3
10:15		40	44	42	39	39	41	46	40	39	42	44	37	45			46	37	41	2.6
10:30		43	43	43	41	38	41	46	40	40	42	43	38	46			46	38	42	2.4
10:45		40	42		41	39	41	45	40	40		44	37	46			46	37	41	2.7
11:00		41	43	46	40	40	40	44	39	43	41	44	37	46			46	37	42	2.7
11:15		41	45	42	41	45	41	44	40	48		45	39	46			48	39	43	2.8
11:30		40	46	44	40	42	40	43	38	46	42	44	38	45			46	38	42	2.7
11:45		40	44	44		42	40	43	40	49	47	44	38	46			49	38	43	3.2
12:00		41		44		41	40	43	40	45	45	45	40	46			46	40	43	2.4
12:15		40	45	44	41	41	40	42	39	44	44	44	40	46			46	39	42	2.3
12:30		40			41	42	40	43	40	43	44	44	37	46			46	37	42	2.5
12:45		40		43	41	41		43	39	45	45	42	39	46			46	39	42	2.5
13:00		40		43	48	40	40	44	39	46	44	44	39	45			48	39	43	3.0
13:15		39		43	47	41	40	45	39	45	43	44	39	46			47	39	42	2.9
13:30	40	40			47	40	43	45	48	44	43	43	38	45			48	38	43	2.9
13:45	39	41		42	43	42	47	43	39	46	43	42	38	46			47	38	43	2.8
14:00	40	42	47	43	41	42	48	41	39	45	41	42	38	46			48	38	43	3.0
14:15	41		51	44	40	41	43	43	39	45	42	42	38	46			51	38	43	3.5
14:30	41	47	50		41	42		42	39	44	40	46	39	47			50	39	43	3.7
14:45	42	46		45	41	41		42	39	45	41	45	41	47			47	39	43	2.7
15:00	42	49		44		40		42	40	42	41	46	40	46			49	40	43	3.2
15:15	43		49	43	41	41	41	42	41	42	41	46	40	46			49	40	43	2.7
15:30	43				40	41	43	40	41	41	43	46	40	47			47	40	42	2.4
15:45	43	46	46	43	40	41	47	41	40	40	44	44	38	47			47	38	43	3.0
16:00	42	46			41	41	46	42	39	40	43	45	40	46			46	39	43	2.6
16:15	41	48	48	43	42	41		44	39	40	43	45	42	46			48	39	43	3.0
16:30	44	49	48	43	42	40	43	44	40	39	42	45	45	46			49	39	43	3.1
16:45	41	49			40	41		45	40	39	40	45	46	46			49	39	43	3.5
17:00	42	46	49		41	39	43	46	39	39	40	45	45	45			49	39	43	3.3
17:15	43	44	48	44	41	39	44	45	39	39	41	45	44	45			48	39	43	2.9
17:30	43	45	48		40	40	45	45	39	41	40	44	45	46			48	39	43	2.9
17:45	43	42	47	41	39	39	45	45	38	40	42	45	44	45			47	38	42	2.9
18:00	41	40	47	41	39	39	45	44	39	43	40	45	43	46			47	39	42	2.9
Max	44	49	51	46	48	45	48	48	48	49	47	46	46	47			51	44	47	1.8
Min	39	39	41	40	38	38	40	40	38	37	39	41	36	42			42	36	39	1.6
Ave	42	43	45	43	41	41	42	45	40	42	42	44	40	45			45	40	42	1.8
SD	1.2	2.9	2.5	1.3	2.0	1.3	2.2	2.2	1.4	2.8	1.7	1.5	2.6	1.1			2.9	1.1	1.9	0.6
90%	40	40	42	41	39	39	40	42	39	39	40	42	37	44			44	37	40	1.7
																		Median	40	

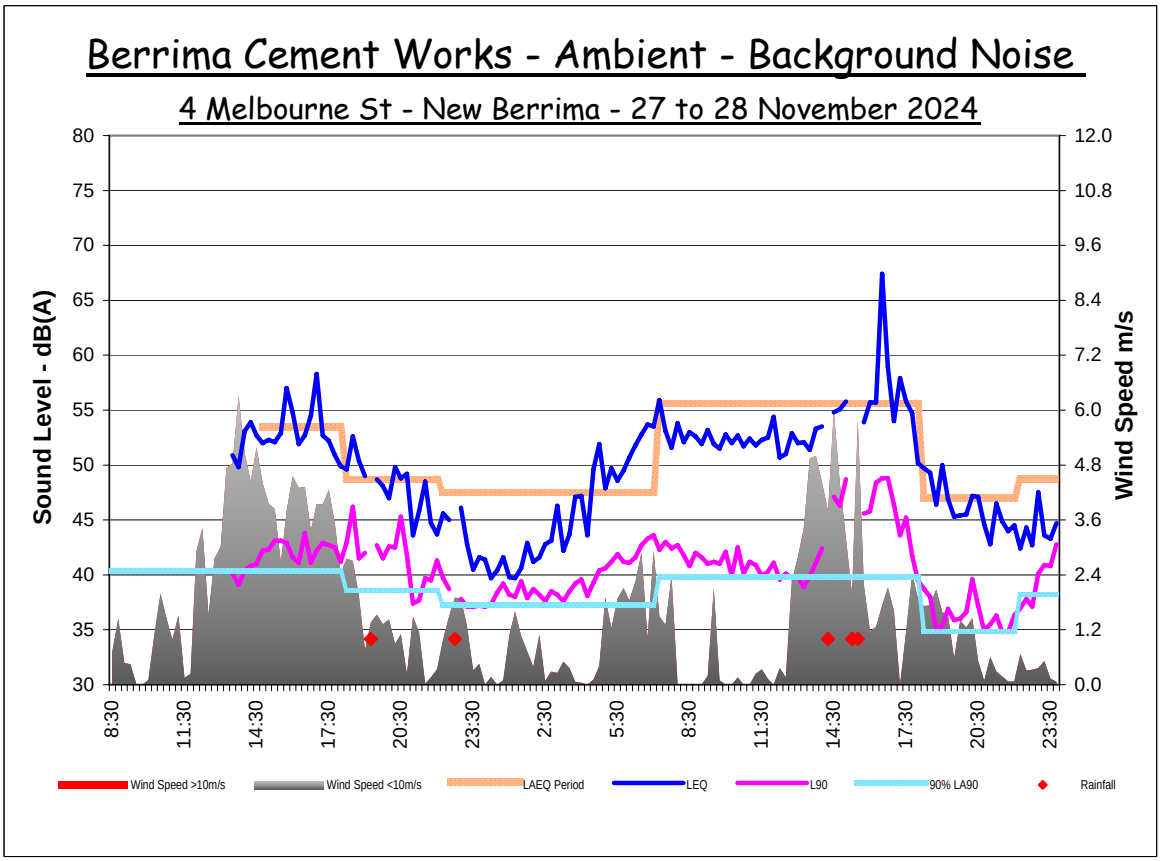
Evening LA90

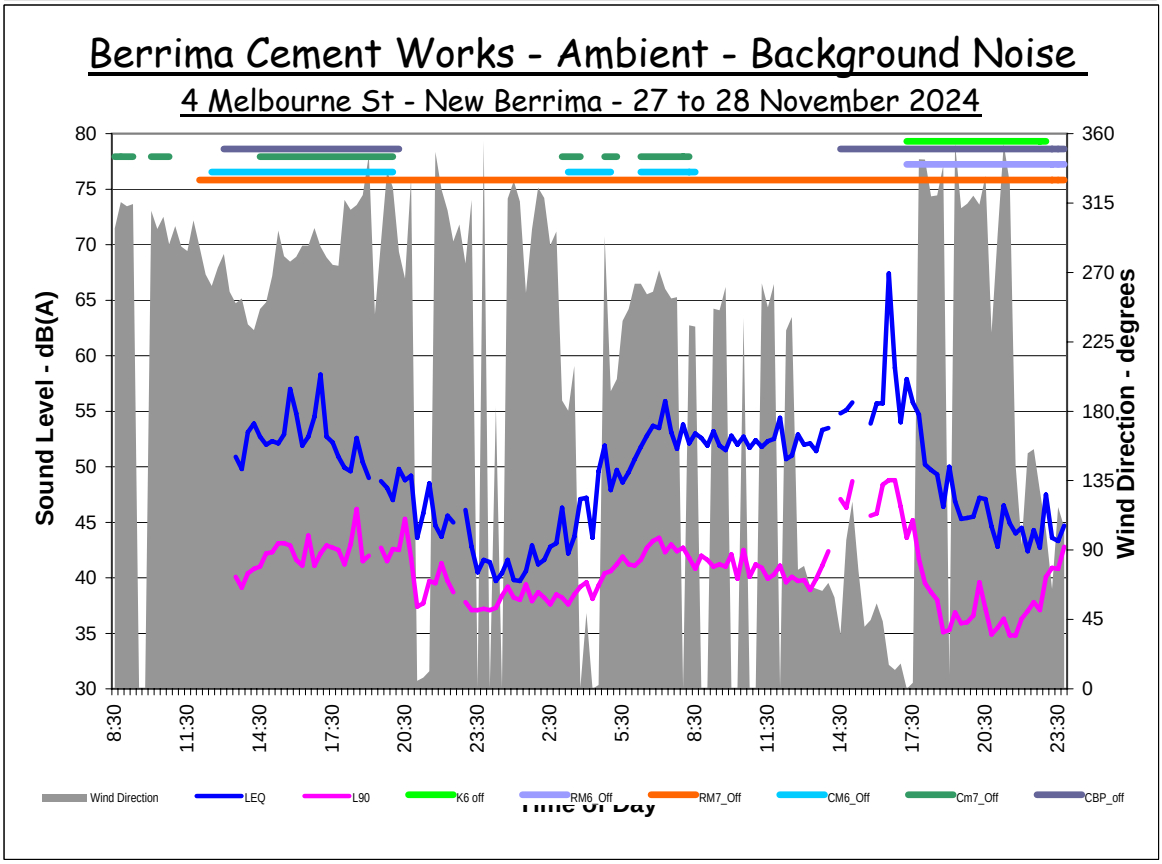
Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	*Maximum*	*Minimum*	*Average*	*SD*
18:00	41	40	47	41	39	39	45	44	39	43	40	45	43	46			47	39	42	2.9
18:15	43	39	46	43	39	40	41	45	39	41		46	42	46			46	39	42	2.9
18:30	46	38	46	44	39	38	39	46	38	41		46	41	46			46	38	42	3.4
18:45	42	35		44	38	39	38	45	37	41		45	39	45			45	35	41	3.6
19:00	42	35	46	43	38	38	38	45	37		43	45	40	44			46	35	41	3.5
19:15		37			38	38	39	45	38	49	42	45	40	45			49	37	41	4.0
19:30	43	36	46	41	38	38	39	45	38		50	45	40	44			50	36	42	4.3
19:45	42	36	46	40	38	38	39	45	39	48	53	45	39	45			53	36	42	5.0
20:00	43	37	48	39	38	39	40	45	38	47	52	45	39	45			52	37	42	4.9
20:15	43	40	48	40	40	39	41	45	39	48	43	43	40	45			48	39	42	3.3
20:30	45	37	47		41	48	41	44	50	49	44	40	39	45			50	37	44	4.0
20:45	42	35	46	38	38	39	41	44	39	46	39	40	39	46			46	35	41	3.6
21:00	37	36	45	39	37	38	40	45	37	45	38	40	37	47			47	36	40	3.8
21:15	38	36	45	41	37	38	40	45	38	45	39	40	37	46			46	36	41	3.5
21:30	40	35	44	39	37	38	39	45	36	44	38	41	37	46			46	35	40	3.6
21:45	40	35	44	38	37	38	39	45	37	44	39	42	37	46			46	35	40	3.6
22:00	41	36	43	38	37	38	38	44	37	44	39	38	38	46			46	36	40	3.2
Max	46	40	48	44	41	48	45	46	50	49	53	46	43	47			53	40	46	3.6
Min	37	35	43	38	37	38	38	44	36	41	38	38	37	44			44	35	39	2.9
Ave	42	37	46	40	38	39	40	45	38	45	43	43	39	45			46	37	41	3.0
SD	2.3	1.6	1.6	2.1	1.1	2.4	1.7	0.6	3.0	2.8	5.3	2.7	1.8	0.7			5.3	0.6	2.1	1.2
90%	39	35	44	38	37	38	38	44	37	41	38	40	37	44			44	35	39	3.0
																		Median	38	

Night LA90

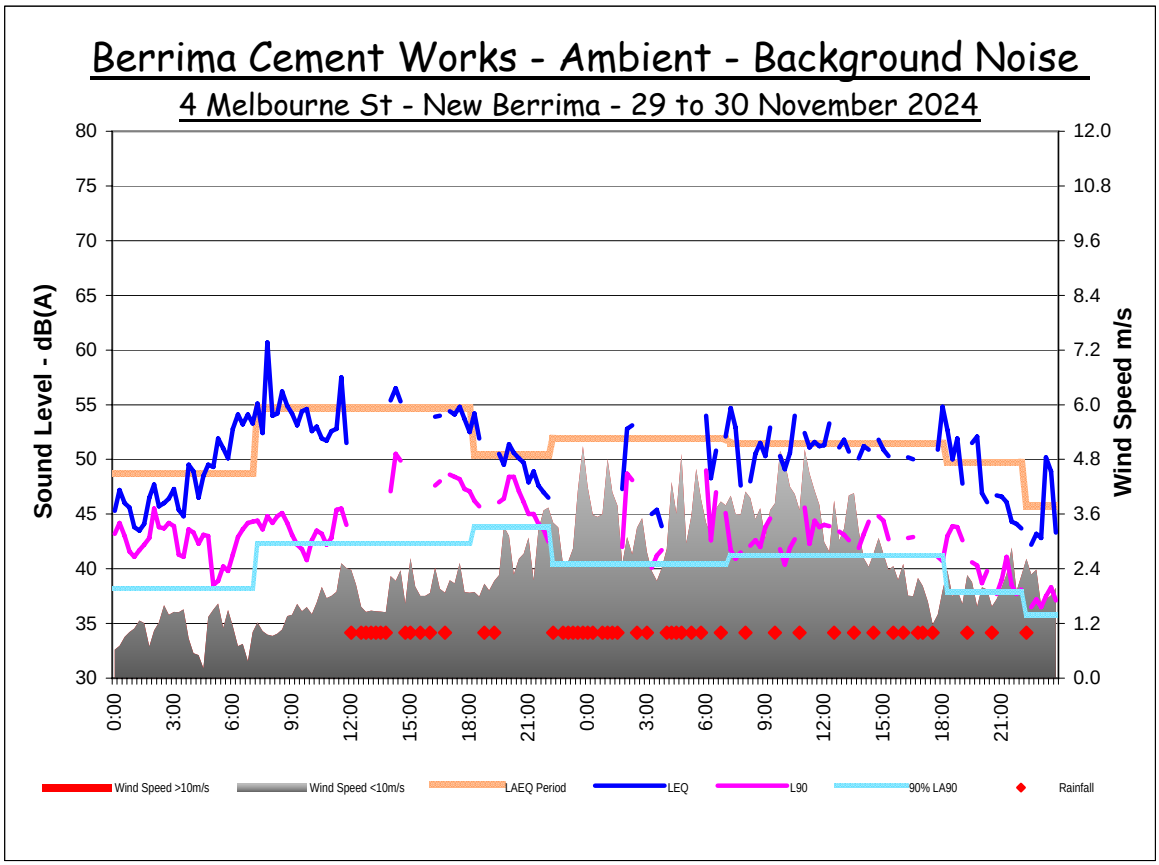
Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	**Maximum**	**Minimum**	**Average**	**SD**
22:00	41	36	43	38	37	38	38	44	37	44	39	38	38	46			46	36	40	3.2
22:15	40	37			37	38	39	42	36	43	39	38	37	45			45	36	39	3.0
22:30	39	38	43	37	37	37	40	42	37	44	40	39	37	45			45	37	40	3.1
22:45		37		37	37	38	39	41	36	44	41	40	37	44			44	36	39	2.8
23:00	38	40		37	37	37	39	41	36	42	41	41	39	45			45	36	40	2.7
23:15	37	41		38	37	37	39	42	36	43	41	42	39				43	36	40	2.3
23:30	37	41		38	37	37	39	41	37	40	42	42	39				42	37	39	2.0
23:45	37	43		37	38	37	40	40	36	39	43	42	40				43	36	39	2.4
0:00	37	43		37	39	37	39	39	36	39	42	41	39	44			44	36	40	2.5
0:15	37	44		37	39	37	40	39	37	43	42	42	39	44			44	37	40	2.8
0:30	38	43	56	38	37	37	39	39	38	44	42	41	41	45			56	37	42	5.1
0:45	39	42		37	38	37	39	42	39	44	42	41	41	45			45	37	40	2.6
1:00	38	41		36	38	36	40	41	38	46	42	41	42	44			46	36	40	2.9
1:15	38	42		36	38	36	40	39	37	45	42	41	41	44			45	36	40	3.0
1:30	39	42		35	38	37	41	39	37	44	42	41	41	44			44	35	40	2.8
1:45	38	43	42	36	37	38	42	38	36	43	41	41	41				43	36	40	2.5
2:00	39	46	49	36	38	38	41	38	36	43	41	41	41				49	36	41	3.8
2:15	38	44	48	36	39	38	41	38	37	42	41	42	40				48	36	40	3.4
2:30	38	44		36	38	38	41	38	36	43	40	41	42				44	36	40	2.7
2:45	39	44	40	36	37	38	40	38	38	43	40	41	42				44	36	40	2.5
3:00	38	44		37	38	39	40	39	38		41	42	42				44	37	40	2.3
3:15	38	41	40	36	37	38	41	39	39	43	42	42	42				43	36	40	2.3
3:30	39	41	41	36	38	38	41	38	39	43	41	43	42				43	36	40	2.3
3:45	39	44	42	38	39	37	40	38	39	41	41	43	43				44	37	40	2.3
4:00	40	43		36	39	37	40	38	38	38	41	43	44				44	36	40	2.6
4:15	38	42		36	39	37	41	39	40	40	42	43	43				43	36	40	2.3
4:30	39	43		36	39	37	42	38	39	41	41	43	44				44	36	40	2.6
4:45	40	43		36	39	38	44	38	40	41	41	43	42				44	36	40	2.6
5:00	41	39	41	37	40	40	44	39	40	43	41	43	43				44	37	41	2.2
5:15	41	39		37	41	40	46	38	42	42	42	44	45				46	37	41	2.7
5:30	42	40	44	39	42	42	47	40	43	41	42	44	45				47	39	42	2.3
5:45	41	40		39	40	41	46	40	42	40	41	43	44				46	39	41	2.0
6:00	41	41	49	38	41	42	47	40	42	39	40	42	44				49	38	42	3.1
6:15	42	43	43	38	42	42	46	39	42	41	41	43	44				46	38	42	2.1
6:30	43	44	47	40	43	44	46	40	43	41	41	42	45				47	40	43	2.3
6:45	43	44		40	43	44	47	41	43	41	42	43	45				47	40	43	1.9
7:00	44	44	45	40	43	43	47	42	44	41	42	43	44				47	40	43	1.9
Max	44	46	56	40	43	44	47	44	44	46	43	44	45	46			56	40	45	3.6
Min	37	36	40	35	37	36	38	38	36	38	39	38	37	44			44	35	38	2.1
Ave	39	42	44	37	39	38	42	40	39	42	41	42	42	45			45	37	41	2.2
SD	1.8	2.3	4.3	1.3	1.8	2.1	2.8	1.6	2.5	1.8	0.9	1.5	2.3	0.7			4.3	0.7	2.0	0.9
90%	37	38	40	36	37	37	39	38	36	40	40	40	38	44			44	36	39	2.2
																		Median	38	

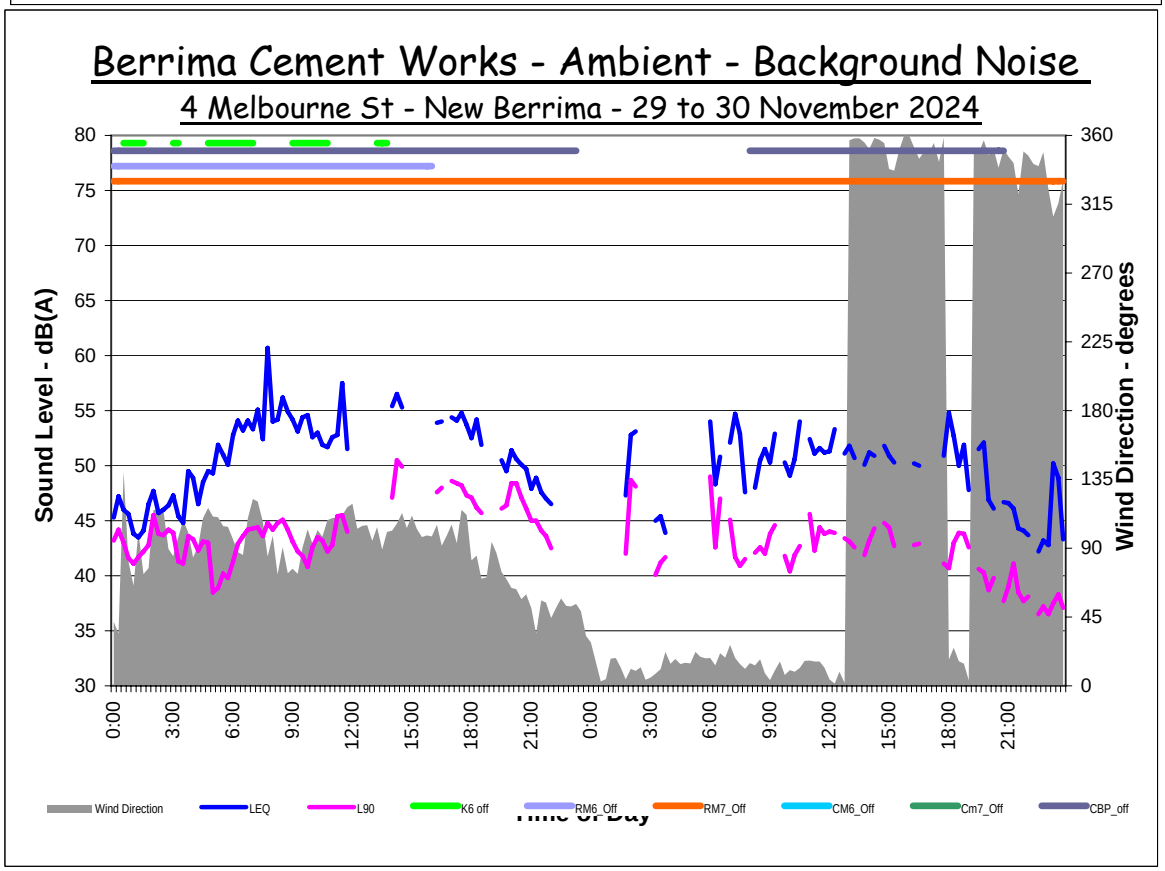
Two Day Results of Ambient Noise Monitoring



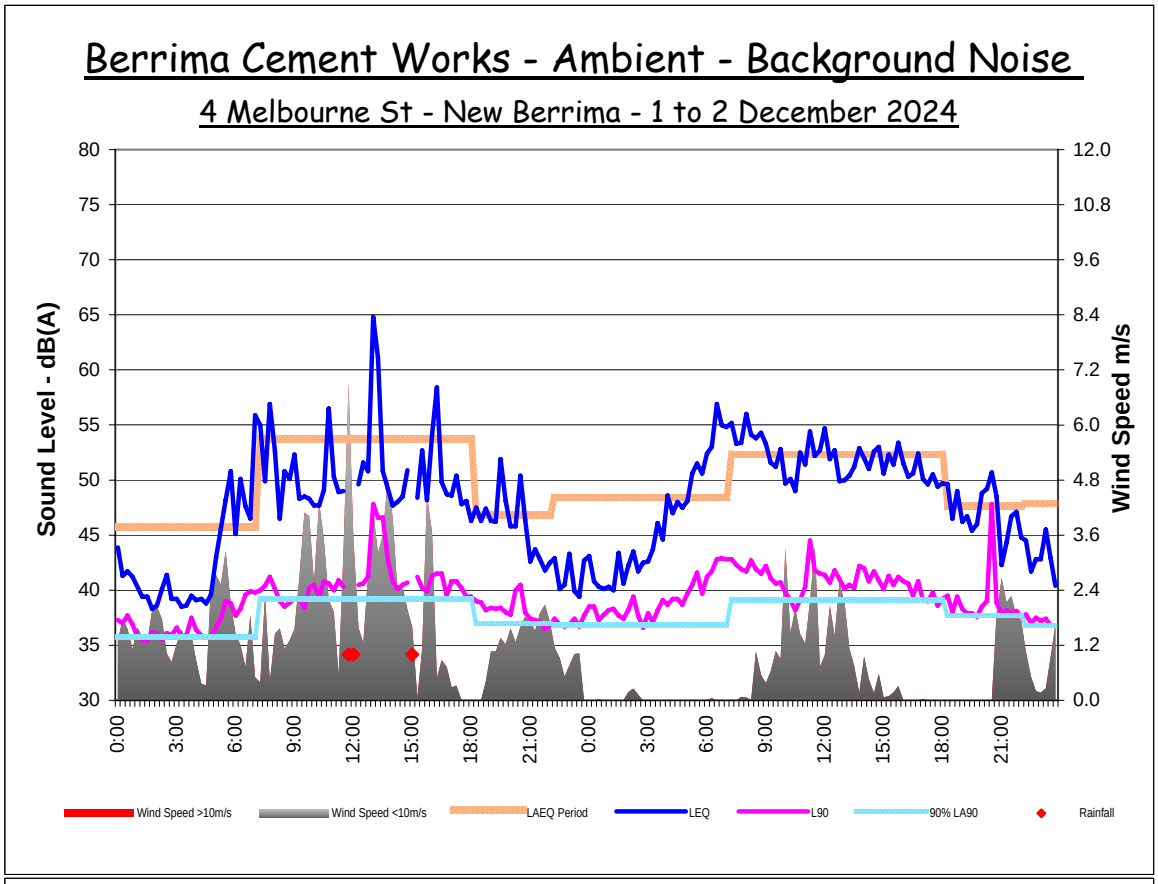


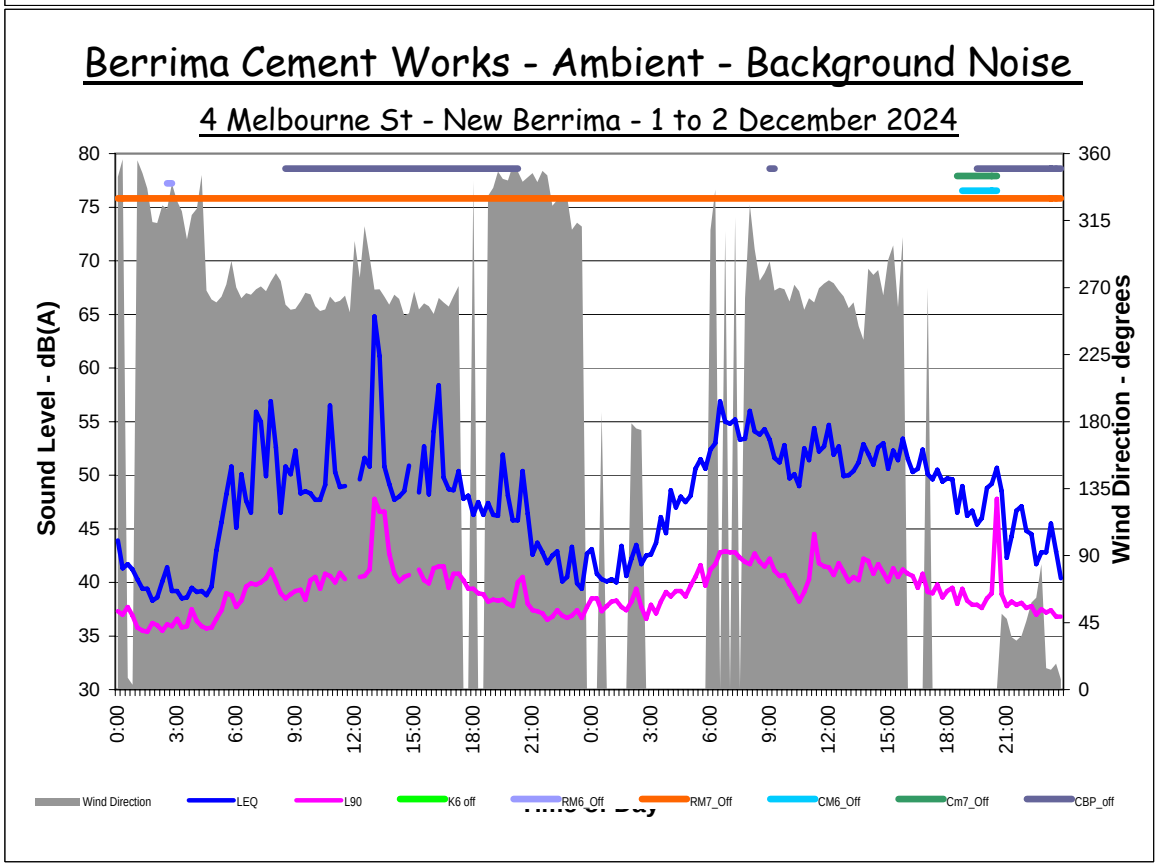
Two Day Results of Ambient Noise Monitoring



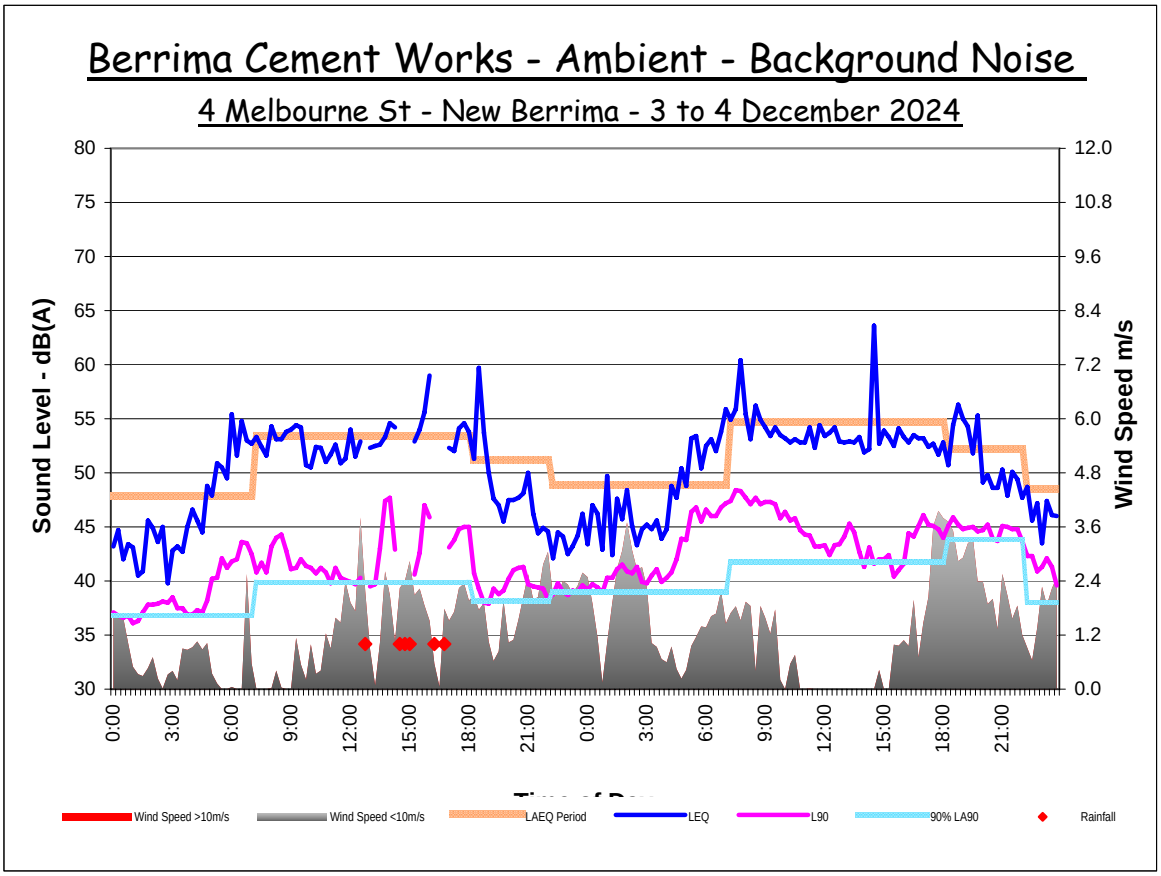


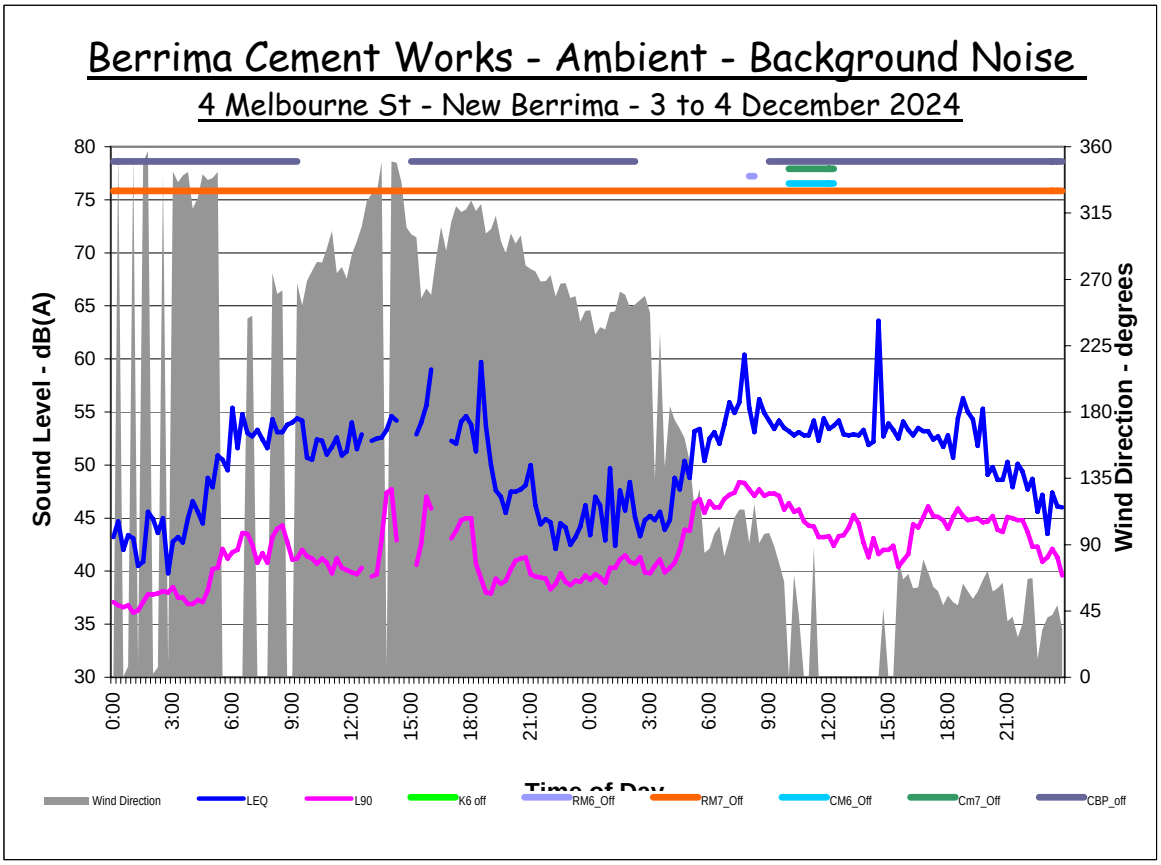
Two Day Results of Ambient Noise Monitoring



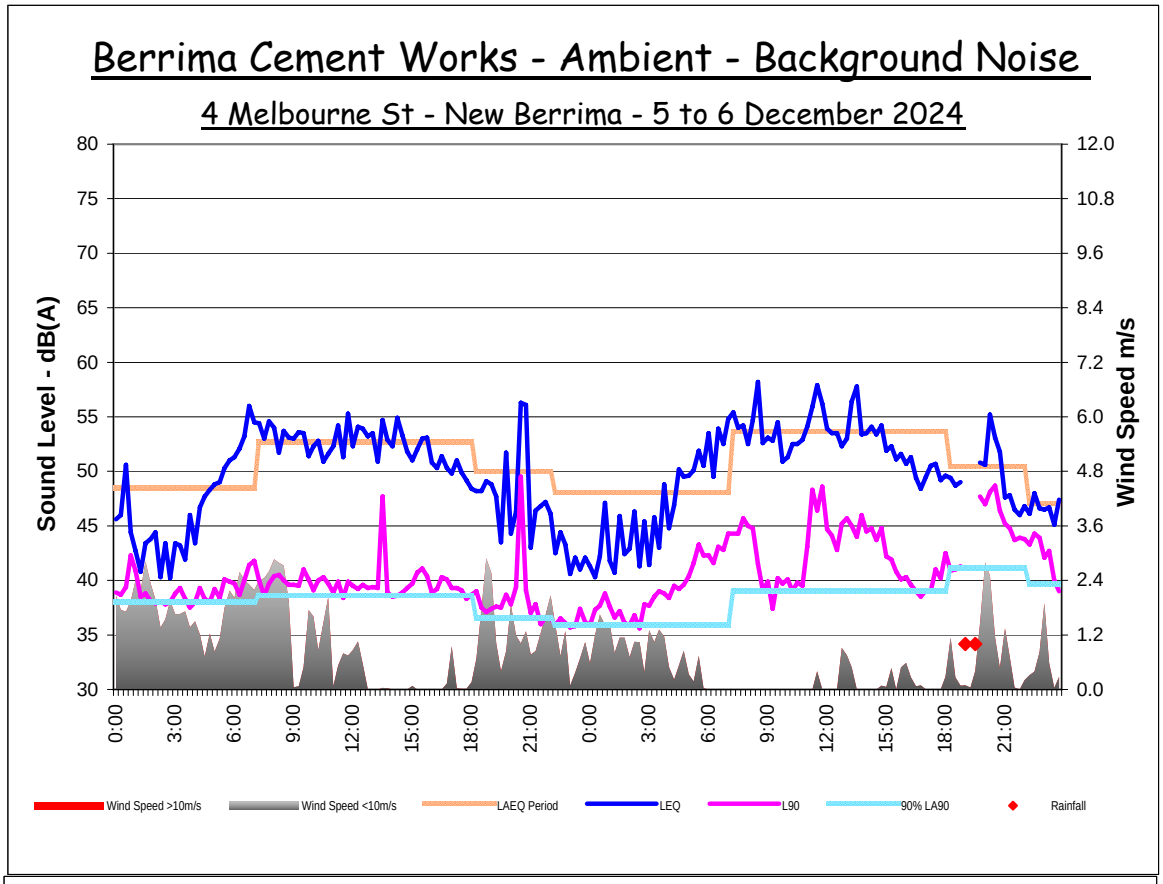


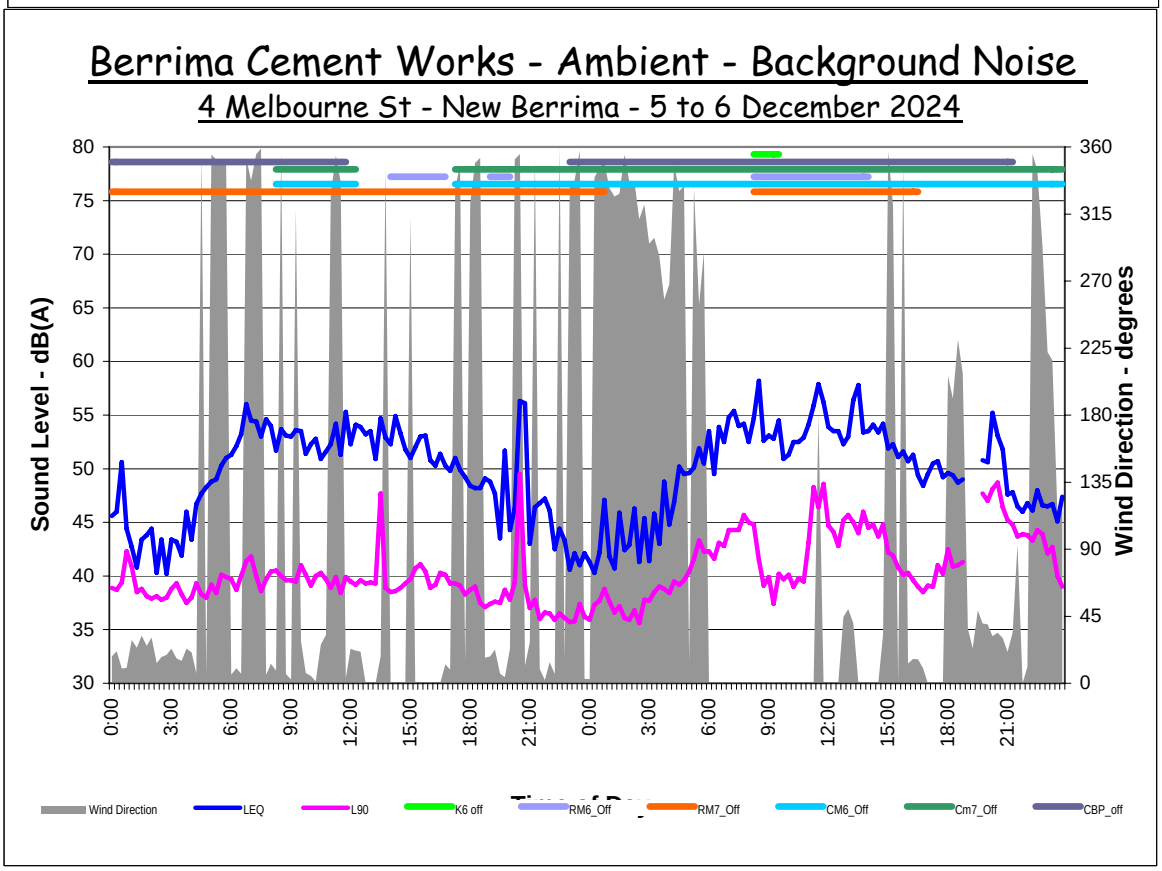
Two Day Results of Ambient Noise Monitoring



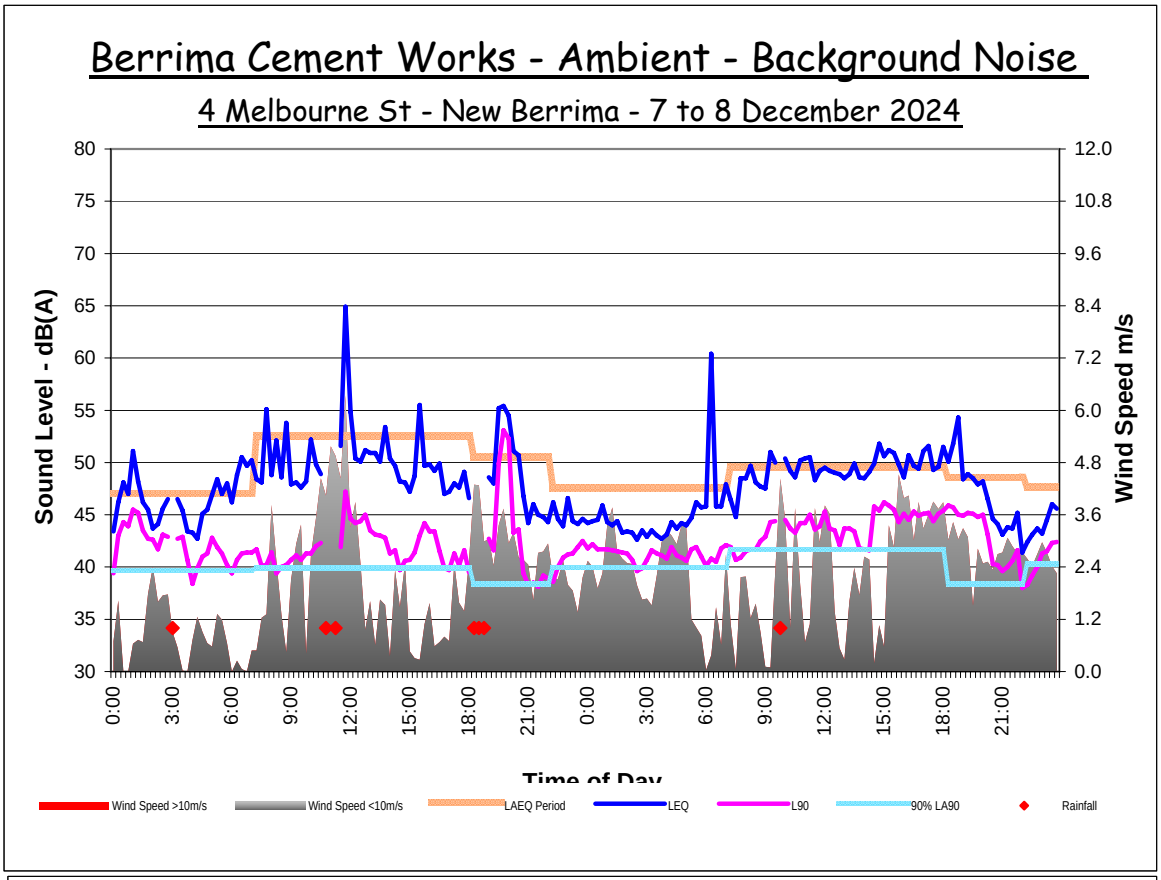


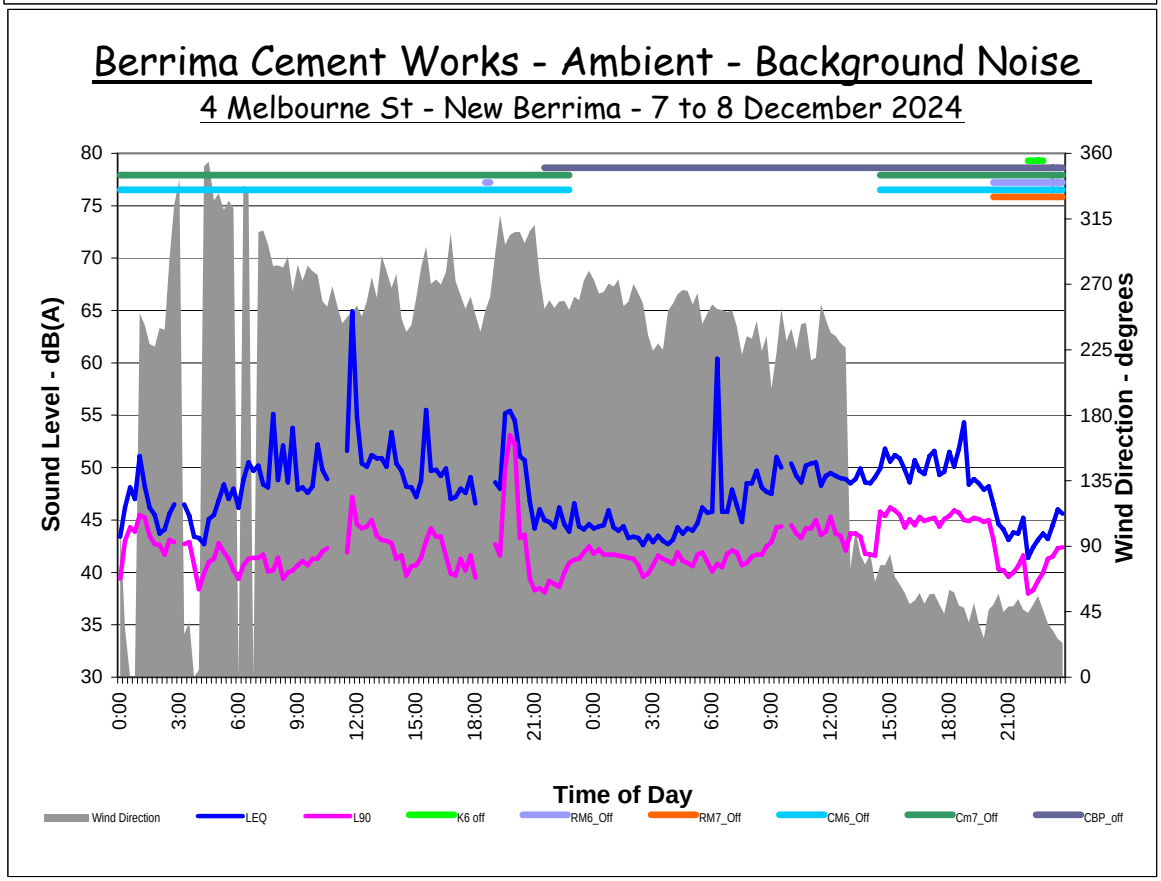
Two Day Results of Ambient Noise Monitoring

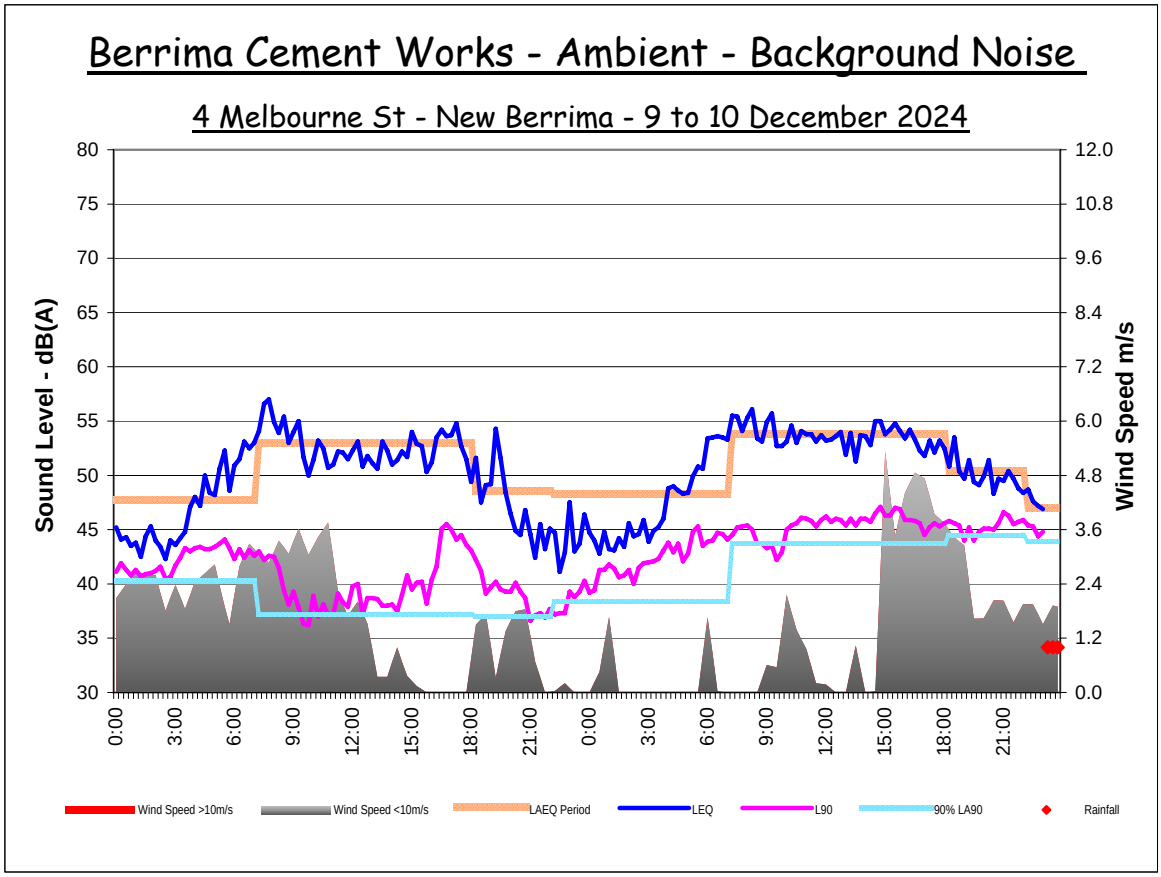


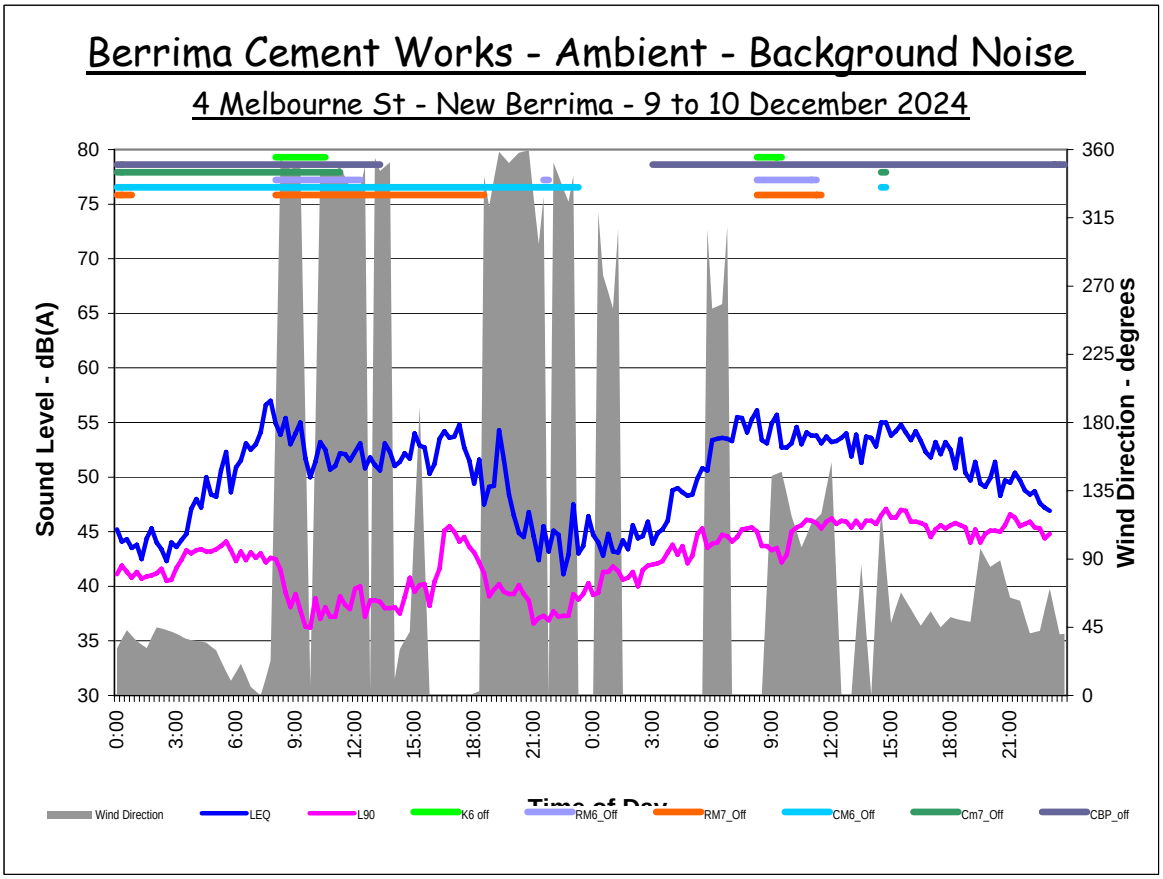


Two Day Results of Ambient Noise Monitoring

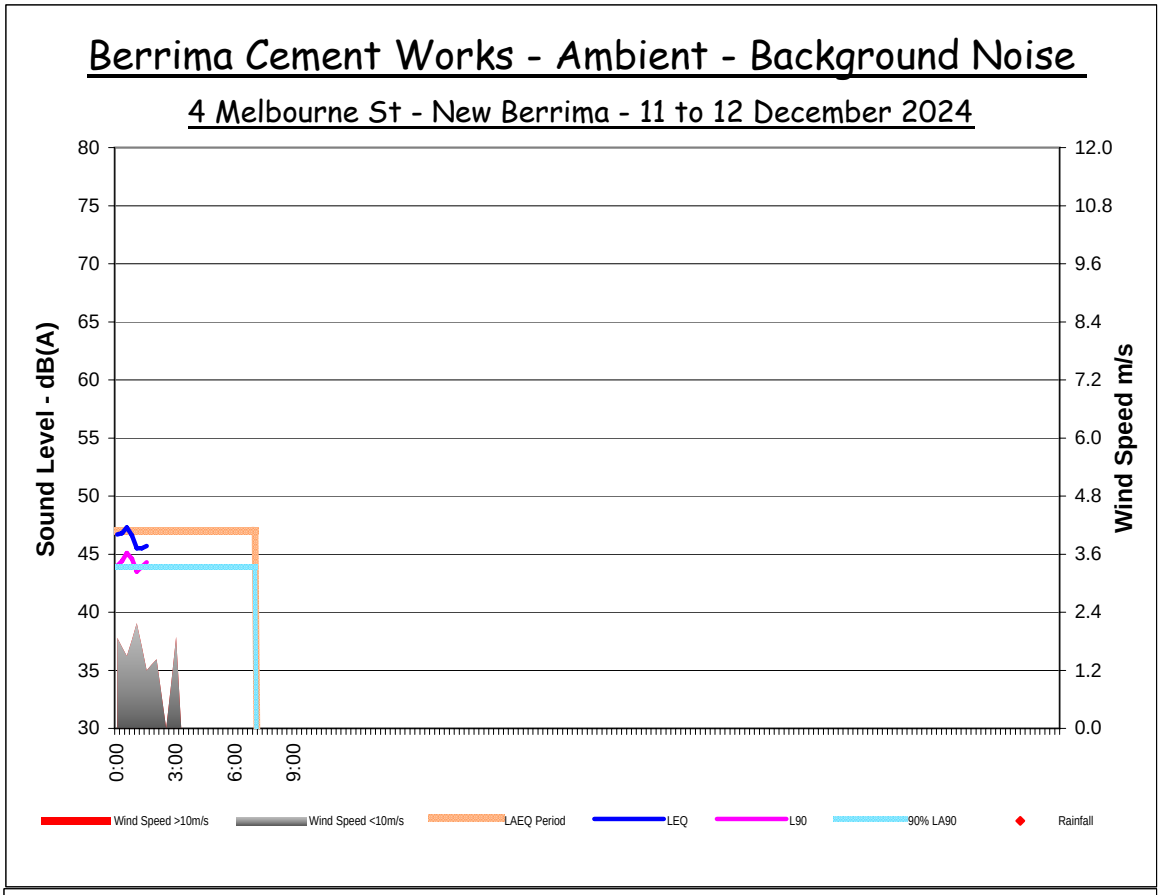


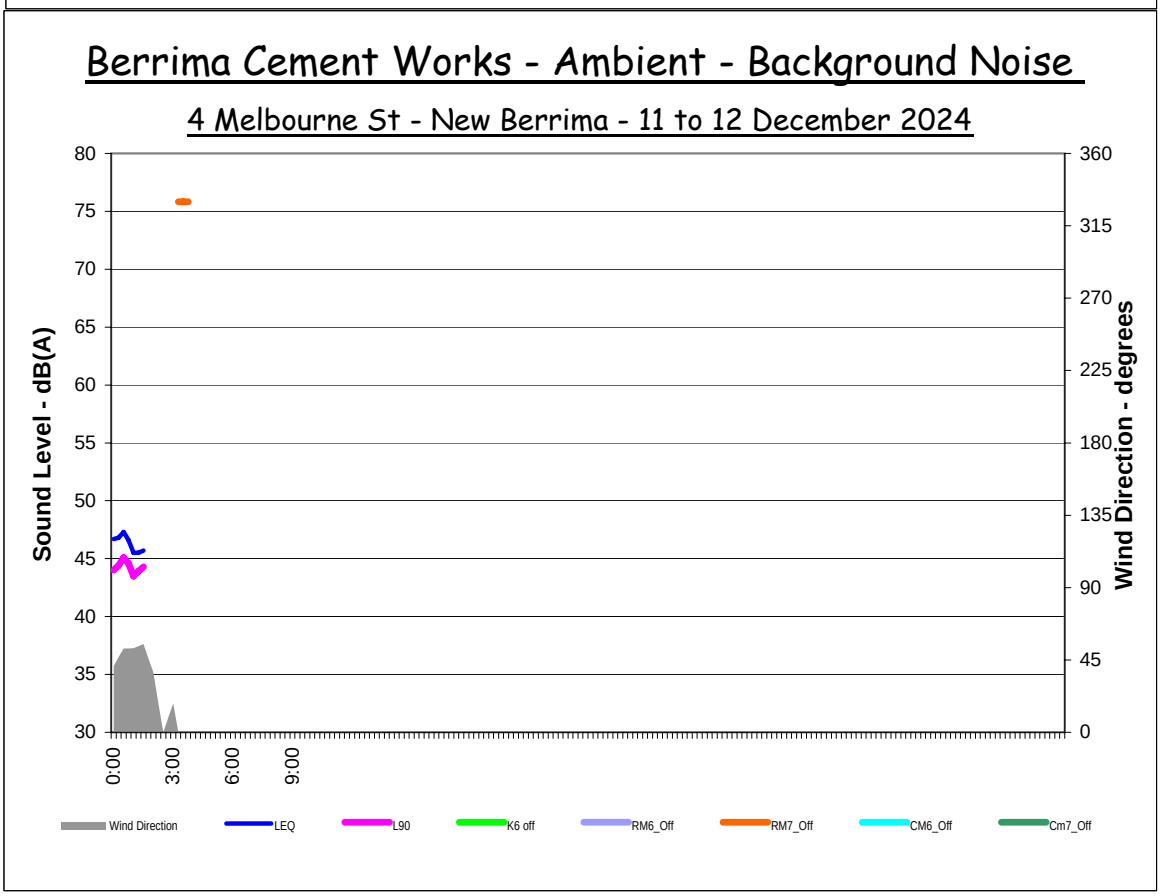


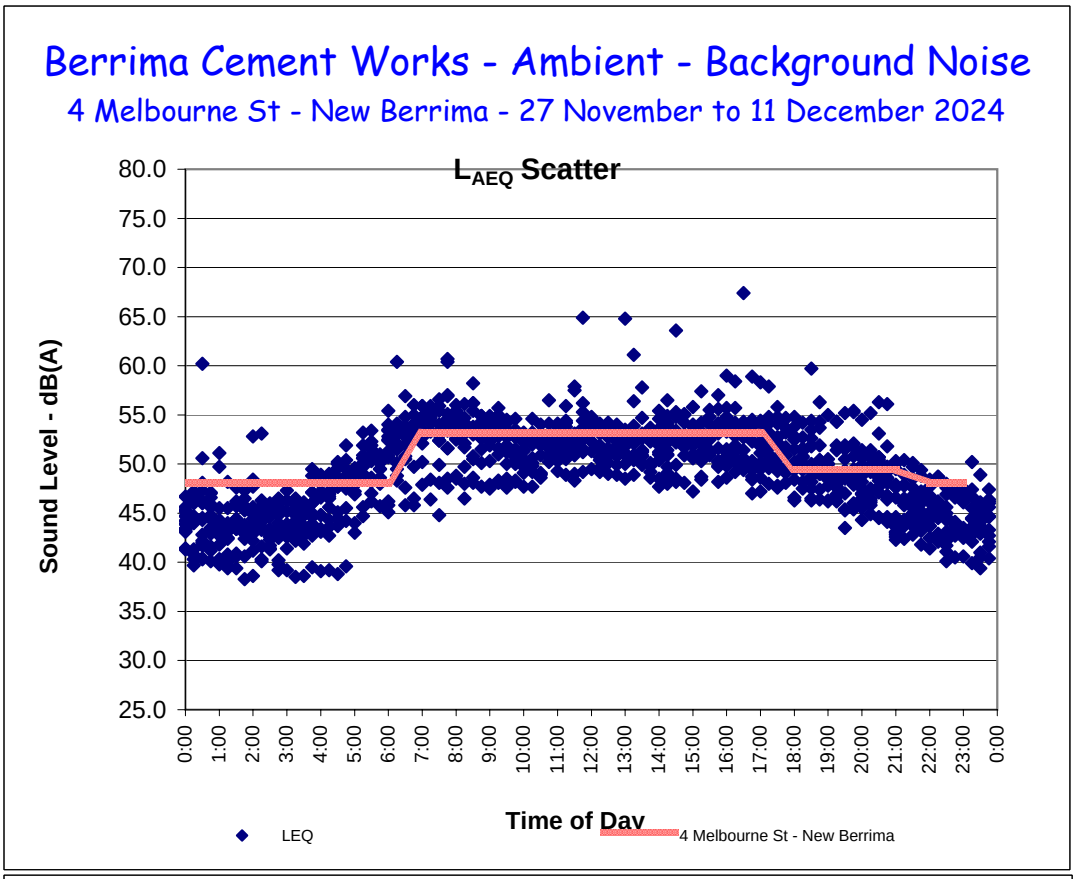

Berrima Cement Works - Ambient - Background Noise
4 Melbourne St - New Berrima - 9 to 10 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

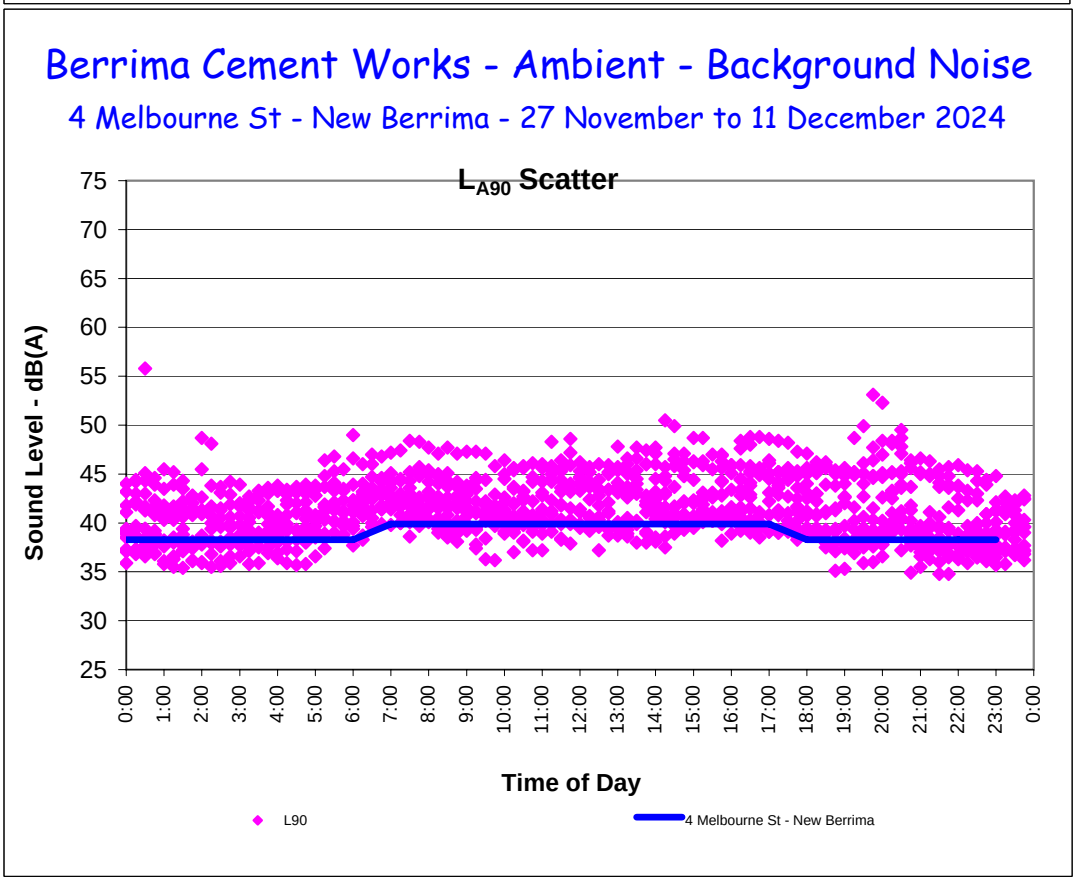

Berrima Cement Works - Ambient - Background Noise
4 Melbourne St - New Berrima - 9 to 10 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Direction
LEQ
L90
K6 off
RM6_Off
RM7_Off
CM6_Off
Cm7_Off
CBP_off

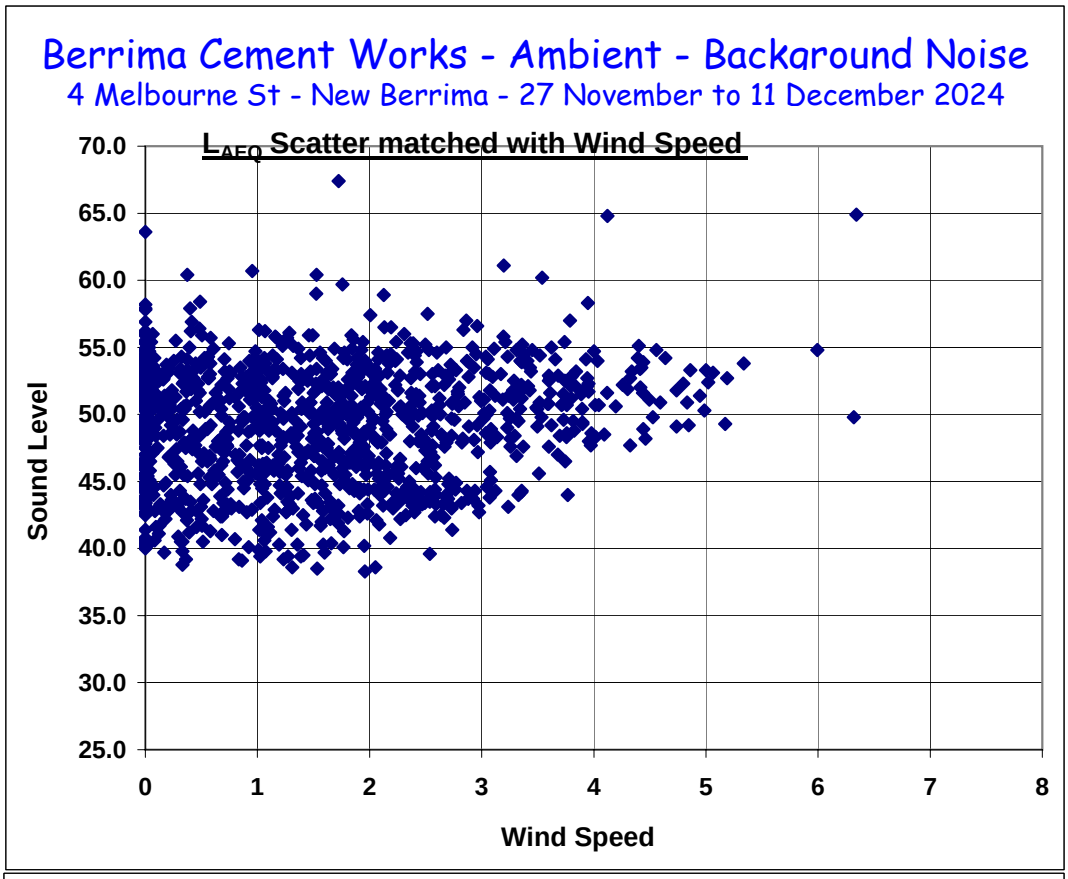
Two Day Results of Ambient Noise Monitoring

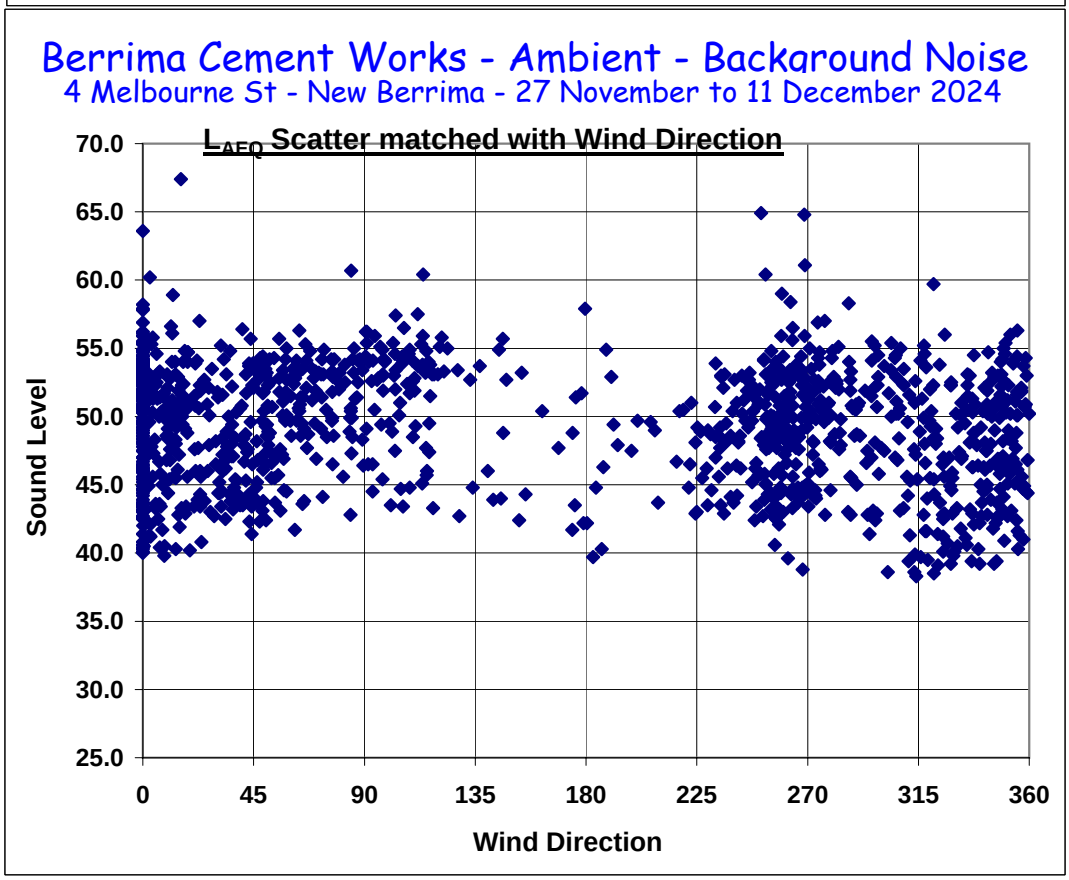


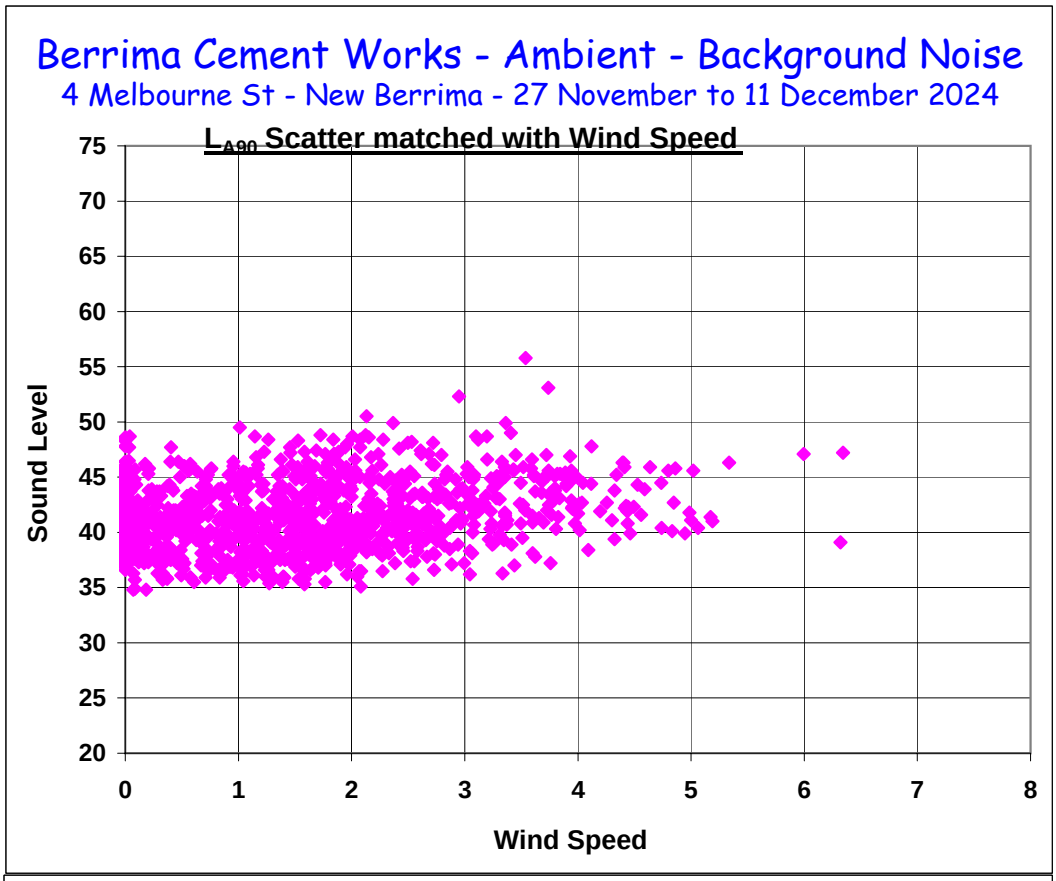


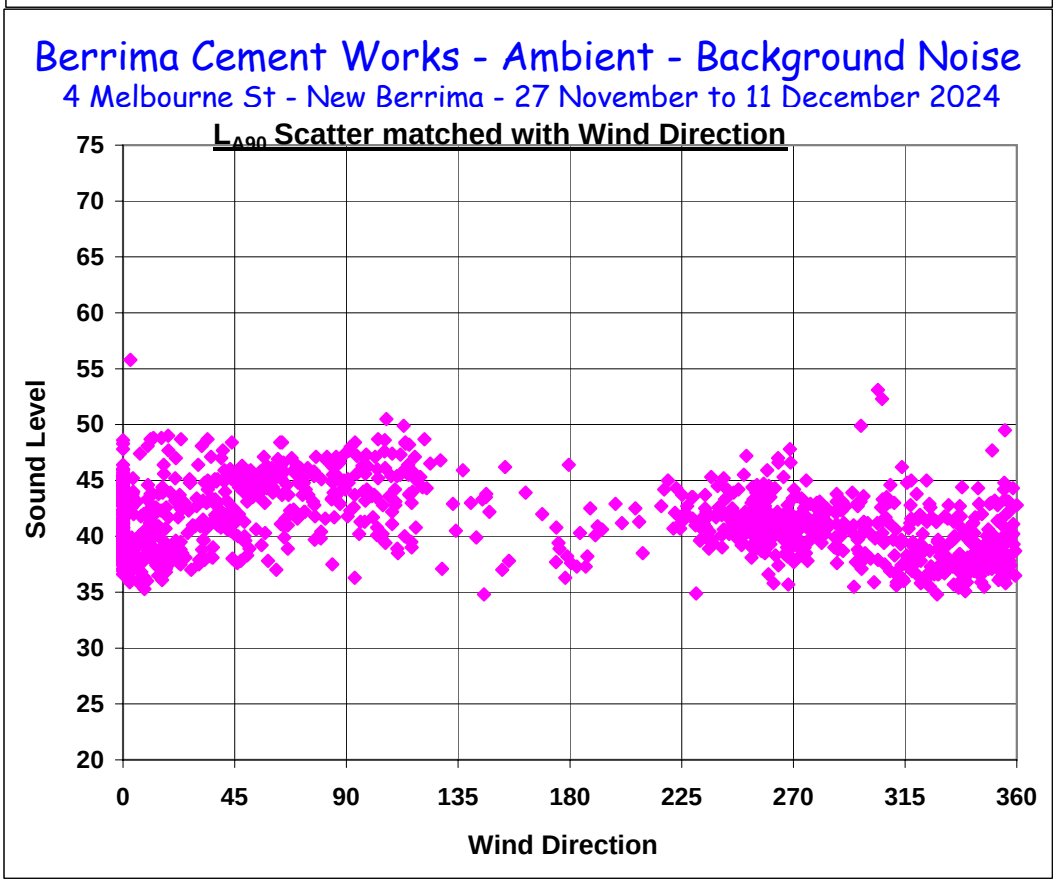

Berrima Cement Works - Ambient - Background Noise
4 Melbourne St - New Berrima - 27 November to 11 December 2024
L_{AEQ} Scatter
Sound Level - dB(A)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time of Day
LEQ
4 Melbourne St - New Berrima


Berrima Cement Works - Ambient - Background Noise
4 Melbourne St - New Berrima - 27 November to 11 December 2024
L_{A90} Scatter
Sound Level - dB(A)
75
70
65
60
55
50
45
40
35
30
25
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time of Day
L90
4 Melbourne St - New Berrima


Berrima Cement Works - Ambient - Backaround Noise
4 Melbourne St - New Berrima - 27 November to 11 December 2024
LAEQ Scatter matched with Wind Speed
Sound Level
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0
1
2
3
4
5
6
7
8
Wind Speed


Berrima Cement Works - Ambient - Backaround Noise
4 Melbourne St - New Berrima - 27 November to 11 December 2024
LAEQ Scatter matched with Wind Direction
Sound Level
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0
45
90
135
180
225
270
315
360
Wind Direction


Berrima Cement Works - Ambient - Background Noise
4 Melbourne St - New Berrima - 27 November to 11 December 2024
L_{A90} Scatter matched with Wind Speed
Sound Level
75
70
65
60
55
50
45
40
35
30
25
20
0
1
2
3
4
5
6
7
8
Wind Speed


Berrima Cement Works - Ambient - Background Noise
4 Melbourne St - New Berrima - 27 November to 11 December 2024
L_{A90} Scatter matched with Wind Direction
Sound Level
75
70
65
60
55
50
45
40
35
30
25
20
0
45
90
135
180
225
270
315
360
Wind Direction

ABN: 25 153 946 064
ACN: 153 946 064

Appendix C: Unattended environmental sound level results for Northern Boundary

North Fence - Cement Works

Daytime LAEQ **27 November to 11 December 2024**

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	*Maximum*	*Minimum*	*Average*	*SD*
7:00		55	53	48	49	54	54	55	49	51	48	47	49	51	56		56	47	51	3.0
7:15		51	54	52	49	51	56	56	50	50	49	48	48	51	49		56	48	51	2.7
7:30		51	54	49	49	52	60	56	49	46	47	48	49	53	49		60	46	51	3.8
7:45		50	53	49	48	54	55	55	48	48	48	49	48	50	49		55	48	50	2.8
8:00		50	48		48	52	52	56	48	48	49	51	47	52	49		56	47	50	2.6
8:15		50	52	48	50	49	54	54	48	49	47	50	48	49	51		54	47	50	2.1
8:30		50	51	49	49	49	52	53	48	49	48	51	46	51	49		53	46	50	1.7
8:45		50	51	49	50	48	53	53	47	49	49	51	46	52	48		53	46	50	2.1
9:00		50	49	47	49	48	52	54	47	49	50	50	46	53	49		54	46	49	2.1
9:15		49	51	49	49	47	49	53	47	49	49	49	47	54	53		54	47	50	2.3
9:30		49	51		49	48	50	55	48	49	49	50	46	52	48		55	46	49	2.2
9:45		50	51	52	48	48	49	51	49	49	49		48	53			53	48	50	1.7
10:00		52	56	49	48	51	57	51	48	48	51	51	48	52			57	48	51	2.9
10:15		50	56	48	47	49	50	50	48	50	52	51	47	52			56	47	50	2.5
10:30		49	51	48	47	50	52	50	48	48	56	52	47	54			56	47	50	2.6
10:45		50	53		48	51	51	50	47	50		52	48	54			54	47	50	2.1
11:00		50	54	50	47	50	51	51	48	51	50	51	48	52			54	47	50	1.8
11:15		48	51	48	47	49	50	50	47	51		53	47	52			53	47	49	2.2
11:30		48	52	48	52	49	50	51	47	53	50	49	47	52			53	47	50	2.1
11:45		48	54	47		48	49	51	48	53	52	50	48	52			54	47	50	2.3
12:00		54		46		49	51	52	48	57	50	51	47	52			57	46	51	3.2
12:15		52	50	46	49	49	52	52	48	57	50	52	49	52			57	46	51	2.7
12:30		54			49	49	50	52	48	57	50	51	47	52			57	47	51	2.8
12:45		54		47	48	49		51	47	52	50	50	47	52			54	47	50	2.2
13:00		54		47	47	49	51	51	48	52	48	51	47	52			54	47	50	2.2
13:15		53		47	47	49	49	50	48	51	47	53	47	52			53	47	49	2.4
13:30		54			48	49	50	51	48	51	49	53	47	53			54	47	50	2.2
13:45		54		47	49	49	49	50	49	50	48	53	48	52			54	47	50	2.1
14:00		53	52	50	48	48	54	50	49	53	49	53	48	52			54	48	51	2.3
14:15			52	49	49	49	51	49	48	53	51	52	48	52			53	48	50	1.8
14:30		52	53		48	49		50	48	49	51	52	48	53			53	48	50	1.9
14:45		55		49	55	49		51	47	48	50	52	48	53			55	47	51	3.0
15:00		56		48		48		52	46	49	49	52	48	52			56	46	50	2.9
15:15			53	46	49	47	57	52	48	48	47	52	52	52			57	46	50	3.3
15:30					49	48	58	53	48	47	48	52	53	52			58	47	51	3.5
15:45		54	52	46	48	47	54	53	49	45	47	53	52	51			54	45	50	3.0
16:00		55			52	48	49	52	47	47	48	52	50	52			55	47	50	2.5
16:15		52	53	46	58	48		52	47	48	47	52	53	53			58	46	51	3.6
16:30	48	53	53	46	47	48	53	52	46	48	46	52	50	53			53	46	50	2.9
16:45	49	50			47	48		52	47	48	47	53	51	53			53	47	49	2.3
17:00	49	49	52		47	47	48	53	47	47	45	52	49	53			53	45	49	2.7
17:15	49	49	53	46	58	48	48	54	49	48	47	52	49	53			58	46	50	3.3
17:30	50	47	53		47	49	47	56	48	48	48	52	47	52			56	47	50	2.9
17:45	49	48	53	45	48	49	49	53	50	52	48	52	48	61			61	45	50	3.8
18:00	49	47	53	46	47	52	47	53	54	54	50	52	47	53			54	46	50	3.0
Max	50	56	56	52	58	54	60	56	54	57	56	53	53	61	56		61	50	55	2.9
Min	48	47	48	45	47	47	47	49	46	45	45	47	46	49	48		49	45	47	1.3
Ave	49	51	52	48	49	49	52	52	48	50	49	51	48	52	50		52	48	50	1.6
SD	0.6	2.4	1.6	1.6	2.5	1.6	3.1	1.9	1.2	2.8	1.8	1.5	1.7	1.6	2.7		3.1	0.6	1.9	0.7
E Ave	49	52	53	48	50	49	53	53	48	51	49	51	49	53	51		53	48	51	1.7

Evening LAEQ

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	*Maximum*	*Minimum*	*Average*	*SD*
18:00	49	47	53	46	47	52	47	53	54	54	50	52	47	53			54	46	50	3.0
18:15	49	47	53	51	47	50	54	53	49	54		53	48	53			54	47	51	2.6
18:30	54	57	52	49	47	48	58	53	48	53		52	49	53			58	47	52	3.5
18:45	59	57		49	47	49	54	52	47	53		52	49	53			59	47	52	3.7
19:00	57	50	53	47	49	56	54	57	49		50	51	48	53			57	47	52	3.3
19:15		49			58	52	57	52	59	57	62	49	48	53			62	48	54	4.7
19:30	51	46	53	48	54	48	55	53	50		54	49	58	54			58	46	52	3.3
19:45	47	45	52	47	47	48	47	53	47	52	46	50	47	54			54	45	49	3.0
20:00	48	46	52	47	47	48	47	53	48	52	46	50	47	53			53	46	49	2.6
20:15	49	45	51	47	47	47	47	53	47	51	47	50	47	53			53	45	49	2.6
20:30	50	45	51		47	48	46	52	47	51	47	50	46	53			53	45	49	2.7
20:45	51	47	50	47	47	48	45	52	46	51	47	48	47	53			53	45	49	2.5
21:00	49	48	50	46	47	49	45	51	47	51	46	49	46	53			53	45	48	2.4
21:15	49	49	51	46	47	47	46	51	47	52	47	49	46	52			52	46	48	2.2
21:30	49	49	51	46	47	48	46	50	46	51	47	50	48	52			52	46	49	2.1
21:45	48	50	51	46	47	48	46	50	46	51	46	50	49	52			52	46	49	2.2
22:00	48	51	51	53	47	48	46	51	47	51	47	51	48	52			53	46	49	2.3
Max	59	57	53	53	58	56	58	57	59	57	62	53	58	54			62	53	57	2.6
Min	47	45	50	46	47	47	45	50	46	51	46	48	46	52			52	45	48	2.3
Ave	50	49	52	48	48	49	49	52	48	52	49	50	48	53			53	48	50	1.8
SD	3.4	3.5	1.1	2.2	3.0	2.4	4.6	1.5	3.4	1.7	4.4	1.3	2.6	0.6			4.6	0.6	2.6	1.2
E Avg	52	50	52	48	50	50	52	53	50	53	52	51	49	53			53	48	51	1.4

Night LAEQ

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	**Maximum**	**Minimum**	**Average**	**SD**
22:00	48	51	51	53	47	48	46	51	47	51	47	51	48	52			53	46	49	2.3
22:15	48	51			47	47	47	50	47	48	48	51	48	52			52	47	49	1.9
22:30	48	52	50	47	47	47	46	49	47	47	50	51	47	52			52	46	49	1.9
22:45		53		47	48	47	46	49	46	48	48	50	47	52			53	46	48	2.1
23:00	47	53		47	48	48	47	50	47	52	48	51	50	52			53	47	49	2.1
23:15	49	52		47	47	48	47	51	48	52	48	50	50				52	47	49	1.9
23:30	49	50		46	48	47	47	51	47	52	48	50	50				52	46	49	1.8
23:45	48	51		45	49	47	48	50	47	52	48	50	50				52	45	49	1.9
0:00	48	51		46	48	47	47	49	47	53	48	49	49	52			53	46	49	1.9
0:15	50	51		46	49	47	49	49	47	52	47	49	48	52			52	46	49	1.8
0:30	48	53	47	46	48	48	50	48	46	50	47	50	48	52			53	46	49	1.9
0:45	49	54		47	48	48	48	48	46	50	47	49	48	52			54	46	49	2.0
1:00	48	52		47	49	48	48	49	47	49	47	49	48	52			52	47	49	1.7
1:15	47	53		47	48	49	49	49	46	48	47	49	50	52			53	46	49	2.0
1:30	49	52		47	47	49	48	49	47	49	47	50	49	52			52	47	49	1.7
1:45	48	52	46	47	47	49	47	49	47	50	48	50	49	52			52	46	49	1.9
2:00	47	51	46	46	47	48	49	49	48	49	50	51	49	51			51	46	48	1.7
2:15	46	51	46	46	49	48	48	49	47	49	49	51	50	50			51	46	49	1.8
2:30	49	53		47	48	47	47	48	47	46	49	51	51	50			53	46	49	1.9
2:45	49	52	47	46	50	47	47	49	47	46	50	51	51	50			52	46	49	1.8
3:00	48	50		46	50	48	48	49	48		51	51	50	49			51	46	49	1.6
3:15	49	51	47	45	50	48	50	49	48	47	49	51	50	48			51	45	49	1.8
3:30	49	50	47	45	49	50	51	49	47	48	48	51	50	49			51	45	49	1.7
3:45	51	53	47	47	50	50	54	49	59	48	51	51	49	50			59	47	51	3.0
4:00	63	52		48	50	52	64	50	58	55	50	51	54	55			64	48	54	5.2
4:15	53	56		52	57	55	55	50	52	49	51	52	52	52			57	49	53	2.2
4:30	51	48		50	50	56	53	50	51	49	48	50	51	52			56	48	51	2.2
4:45	50	50		46	49	51	54	55	50	48	48	50	52	51			55	46	50	2.3
5:00	57	51	47	49	51	52	54	51	50	50	49	50	51	51			57	47	51	2.5
5:15	59	50		49	54	52	57	54	51	50	49	50	51	51			59	49	52	3.1
5:30	59	52	48	50	52	57	58	57	51	49	49	50	50	51			59	48	52	3.7
5:45	57	50		50	51	56	56	53	52	49	50	51	50	52			57	49	52	2.6
6:00	56	53	49	49	56	55	60	50	52	51	50	50	52	51			60	49	52	3.3
6:15	55	52	48	50	54	51	54	51	52	48	46	50	56	51			56	46	51	2.7
6:30	53	55	48	51	51	53	55	50	53	49	47	50	52	57			57	47	52	2.8
6:45	54	53		50	51	52	54	58	51	48	47	50	52	58			58	47	52	3.1
7:00	55	53	48	49	54	54	55	49	51	48	47	49	51	56			56	47	51	3.0
Max	63	56	51	53	57	57	64	58	59	55	51	52	56	58			64	51	56	3.6
Min	46	48	46	45	47	47	46	48	46	46	46	49	47	48			49	45	47	1.3
Ave	51	52	47	48	50	50	51	50	49	49	48	50	50	52			52	47	50	1.3
SD	4.1	1.5	1.4	2.0	2.6	3.0	4.5	2.3	3.1	1.9	1.2	0.8	1.9	2.1			4.5	0.8	2.2	1.0
E Avg	53	52	48	48	50	51	54	51	51	50	49	50	51	52			54	48	50	1.7
24hr	51	52	52	48	49	50	52	53	50	51	50	50	49	52	52		53	48	51	1.6

North Fence - Cement Works

Daytime LA90 **27 November to 11 December 2024**

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
7:00		47	50	46	46	48	49	52	46	49	46	45	45	49	48		52	45	48	2.1
7:15		48	50	46	45	48	49	52	46	45	46	46	45	48	47		52	45	47	2.1
7:30		47	47	46	46	47	48	52	46	43	45	46	44	49	47		52	43	47	2.3
7:45		47	46	46	46	47	47	53	45	44	45	47	44	48	46		53	44	46	2.2
8:00		47	45		46	47	47	52	44	43	45	49	43	49	46		52	43	46	2.5
8:15		47	46	45	46	46	49	52	45	46	45	48	43	46	47		52	43	46	2.1
8:30		48	46	46	47	46	49	51	45	45	46	48	42	47	45		51	42	47	2.1
8:45		48	46	46	47	45	49	51	44	45	46	48	42	48	44		51	42	46	2.4
9:00		48	46	46	46	45	47	51	44	45	47	47	42	50	46		51	42	46	2.3
9:15		47	47	46	47	45	46	51	44	46	46	48	43	50	48		51	43	47	2.0
9:30		47	47		46	46	46	50	43	46	46	48	43	50	45		50	43	46	2.1
9:45		48	47	47	46	46	45	49	44	46	45		44	50			50	44	46	1.8
10:00		48	49	46	46	47	46	49	44	46	46	49	44	49			49	44	47	1.8
10:15		47	49	47	45	47	46	49	44	46	47	49	43	50			50	43	47	1.9
10:30		46	48	46	45	45	46	49	44	46	48	50	44	51			51	44	47	2.1
10:45		47	50		45	47	46	48	45	48		50	45	50			50	45	47	2.1
11:00		45	50	47	45	46	46	48	44	48	48	49	45	50			50	44	47	2.0
11:15		46	49	46	44	46	46	48	44	48		47	44	50			50	44	47	2.0
11:30		46	49	46	45	46	46	49	44	50	48	47	44	50			50	44	47	2.2
11:45		46	51	46		46	46	49	44	50	48	47	45	50			51	44	47	2.2
12:00		46		45		46	46	50	44	48	48	49	44	50			50	44	47	2.2
12:15		47	47	45	47	46	46	49	44	47	47	49	45	50			50	44	47	1.7
12:30		48			47	47	46	49	44	50	47	47	44	50			50	44	47	2.2
12:45		48		45	46	47		48	44	49	46	46	44	50			50	44	47	2.0
13:00		51		45	45	47	46	48	44	49	45	47	44	50			51	44	47	2.4
13:15		51		45	45	47	45	47	45	49	45	51	44	50			51	44	47	2.5
13:30		51			45	46	45	47	45	49	46	50	45	51			51	45	47	2.6
13:45		51		45	46	46	45	48	46	48	45	51	45	49			51	45	47	2.4
14:00		51	51	44	46	45	45	48	46	48	46	51	45	50			51	44	47	2.7
14:15			50	44	45	45	46	47	45	46	48	50	45	50			50	44	47	2.2
14:30		50	50		46	45		46	45	46	49	49	44	51			51	44	47	2.4
14:45		50		45	46	46		48	44	45	47	50	45	50			50	44	47	2.2
15:00		53		44		45		50	44	46	46	49	46	50			53	44	47	3.0
15:15			51	44	48	44	46	50	45	44	45	50	49	50			51	44	47	2.7
15:30					45	45	47	51	45	43	44	50	50	50			51	43	47	2.9
15:45		51	51	44	46	44	47	51	45	43	44	51	49	49			51	43	47	3.0
16:00		50			46	44	47	50	44	43	44	50	48	49			50	43	47	2.6
16:15		50	51	44	45	45		50	44	45	43	50	50	51			51	43	47	3.1
16:30	46	48	51	44	45	45	48	50	43	45	44	50	49	50			51	43	47	2.8
16:45	46	46			45	44		50	44	46	44	50	48	51			51	44	47	2.8
17:00	47	46	51		45	45	45	51	44	45	44	51	47	51			51	44	47	3.0
17:15	47	45	51	45	45	45	44	51	44	46	44	50	47	51			51	44	47	2.9
17:30	46	43	51		44	45	44	51	43	46	46	50	44	50			51	43	47	3.3
17:45	46	44	51	44	45	43	44	50	44	47	46	50	45	50			51	43	46	2.9
18:00	46	43	51	45	45	44	45	51	44	52	45	51	44	51			52	43	47	3.4
Max	47	53	51	47	48	48	49	53	46	52	49	51	50	51	48		53	46	49	2.2
Min	46	43	45	44	44	43	44	46	43	43	43	45	42	46	44		46	42	44	1.2
Ave	46	48	49	45	46	46	46	50	44	46	46	49	45	50	46		50	44	47	1.7
SD	0.4	2.3	1.9	0.9	0.8	1.0	1.4	1.6	0.7	2.2	1.4	1.6	2.1	1.0	1.2		2.3	0.4	1.4	0.6
90%	46	45	46	44	45	44	45	48	44	43	44	47	43	48	45		48	43	45	1.6
																		Median	45	

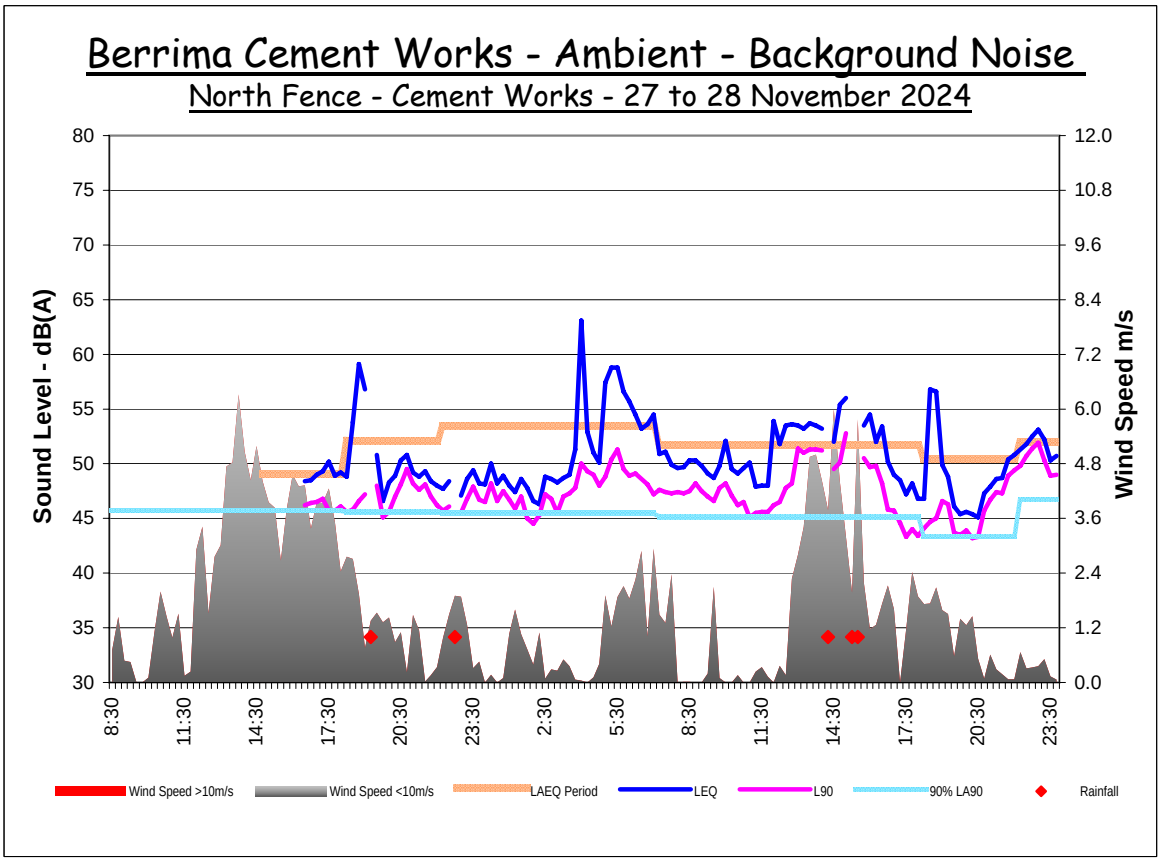
Evening LA90

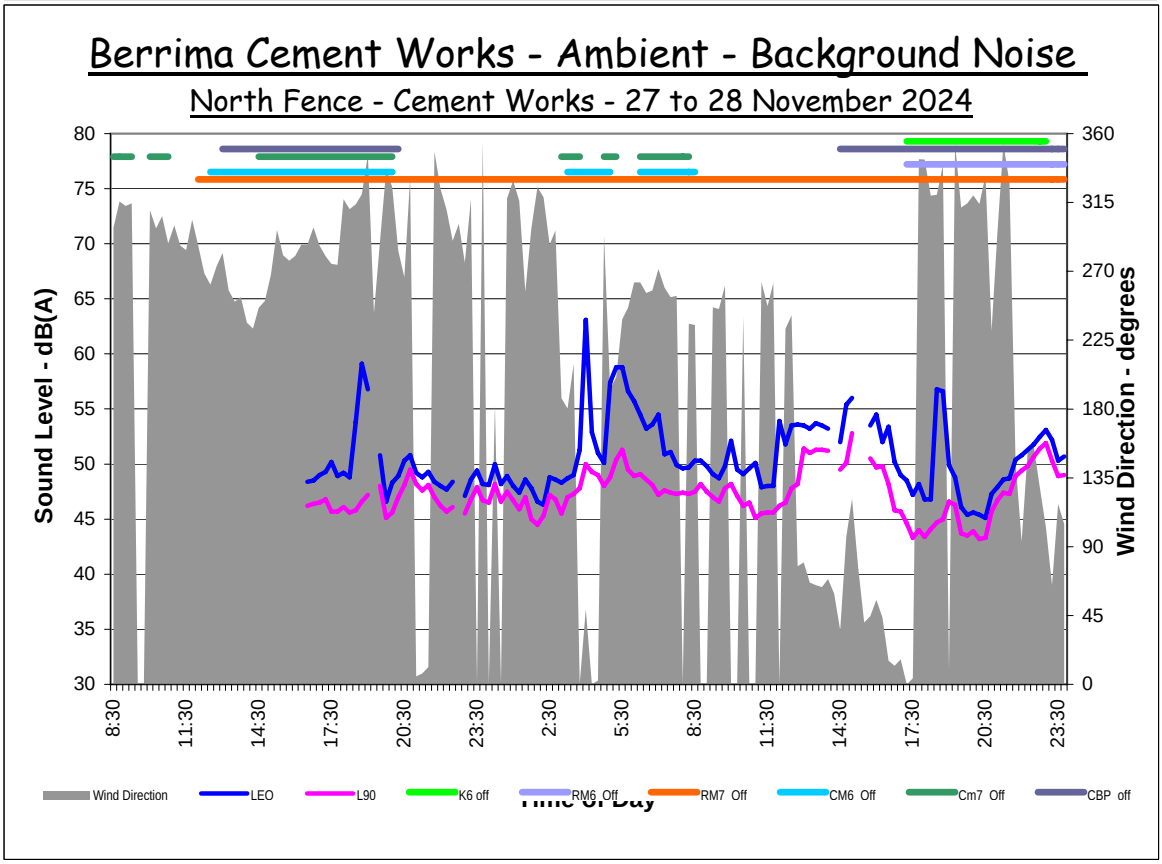
Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
18:00	46	43	51	45	45	44	45	51	44	52	45	51	44	51			52	43	47	3.4
18:15	46	44	51	46	45	44	45	51	43	52		51	46	50			52	43	47	3.3
18:30	46	45	51	47	45	44	45	51	45	51		51	45	51			51	44	47	3.1
18:45	47	45		47	45	45	45	51	45	51		50	45	51			51	45	47	2.8
19:00	47	47	52	45	45	46	46	51	46		46	49	46	51			52	45	47	2.5
19:15		46			47	49	46	50	53	51	50	47	45	51			53	45	49	2.5
19:30	48	44	52	46	47	46	47	51	46		44	48	45	52			52	44	47	2.8
19:45	45	44	51	46	46	46	45	51	45	51	44	47	44	53			53	44	47	3.1
20:00	46	44	50	45	46	46	45	51	46	50	44	48	45	51			51	44	47	2.8
20:15	47	43	50	45	45	45	45	51	44	49	44	49	45	52			52	43	47	2.9
20:30	48	43	49		45	46	44	51	45	50	45	49	44	52			52	43	47	2.9
20:45	50	46	49	45	46	45	44	50	45	50	45	46	45	52			52	44	47	2.6
21:00	48	47	49	44	46	46	44	49	45	50	44	46	44	51			51	44	47	2.5
21:15	48	47	49	44	46	45	45	49	45	51	45	47	44	51			51	44	47	2.4
21:30	48	47	49	44	45	45	44	49	44	51	45	47	45	51			51	44	47	2.4
21:45	47	49	49	44	45	46	44	49	44	50	45	48	47	51			51	44	47	2.4
22:00	46	49	49	45	45	46	45	50	45	50	45	49	46	51			51	45	47	2.4
Max	50	49	52	47	47	49	47	51	53	52	50	51	47	53			53	47	50	2.2
Min	45	43	49	44	45	44	44	49	43	49	44	46	44	50			50	43	46	2.4
Ave	47	45	50	45	45	46	45	50	45	51	45	48	45	51			51	45	47	2.4
SD	1.2	2.0	1.1	0.9	0.6	1.1	0.8	0.9	2.1	0.7	1.4	1.5	0.8	0.7			2.1	0.6	1.1	0.5
90%	46	43	49	44	45	44	44	49	44	50	44	47	44	51			51	43	46	2.5
																		Median	45	

Night LA90

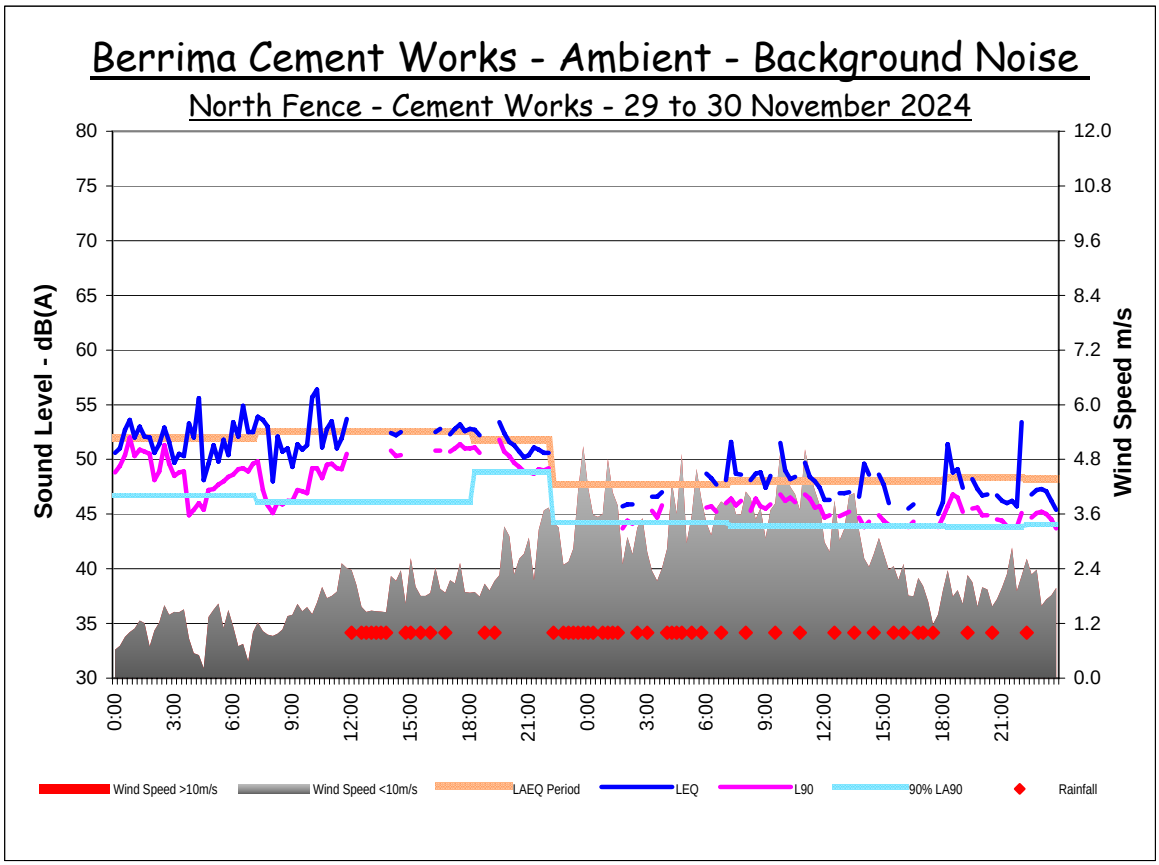
Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
22:00	46	49	49	45	45	46	45	50	45	50	45	49	46	51			51	45	47	2.4
22:15	46	50			45	45	45	49	45	46	46	49	46	51			51	45	47	2.2
22:30	46	51	48	45	45	46	45	48	45	46	47	49	46	50			51	45	47	2.1
22:45		51		45	46	46	45	47	44	46	47	48	45	50			51	44	47	2.2
23:00	46	52		45	46	46	46	48	45	50	47	49	46	50			52	45	48	2.2
23:15	47	50		45	46	46	46	49	45	50	47	48	48				50	45	47	1.9
23:30	48	49		45	46	46	45	50	45	51	47	48	48				51	45	47	2.1
23:45	47	49		44	48	45	46	48	45	50	47	48	48				50	44	47	1.9
0:00	47	49		44	47	45	46	47	45	51	46	48	48	50			51	44	47	2.2
0:15	48	49		44	47	46	48	47	45	50	46	48	46	50			50	44	47	2.0
0:30	47	50	45	45	46	46	48	46	44	49	46	48	47	50			50	44	47	2.1
0:45	48	52		45	47	46	47	47	44	49	46	48	46	50			52	44	47	2.2
1:00	47	50		45	48	47	47	47	44	48	45	48	46	51			51	44	47	2.0
1:15	46	51		45	46	47	48	47	44	47	45	48	48	51			51	44	47	2.1
1:30	47	51		45	45	47	46	46	45	48	46	48	48	50			51	45	47	1.9
1:45	45	51	44	45	45	47	46	47	45	49	46	49	48	50			51	44	47	2.1
2:00	45	48	44	45	45	46	47	47	46	48	48	49	48	50			50	44	47	1.7
2:15	45	49	44	45	47	46	47	47	46	48	47	50	48	49			50	44	47	1.7
2:30	47	51		46	47	46	46	46	45	44	48	50	49	48			51	44	47	2.1
2:45	47	50	45	45	48	45	46	47	46	45	48	49	49	48			50	45	47	1.8
3:00	46	49		44	48	46	46	48	46		50	50	49	47			50	44	47	1.8
3:15	47	49	45	43	47	46	48	47	46	46	47	49	49	47			49	43	47	1.7
3:30	47	49	45	44	48	48	49	46	45	46	46	50	49	47			50	44	47	1.9
3:45	48	45	46	45	48	48	49	47	46	47	46	49	48	48			49	45	47	1.5
4:00	50	45		46	48	49	53	47	48	47	46	49	50	49			53	45	48	2.0
4:15	49	46		47	48	49	52	47	49	45	46	49	50	49			52	45	48	1.9
4:30	49	45		46	47	49	51	47	48	46	45	49	49	49			51	45	47	1.7
4:45	48	47		44	47	49	52	47	48	46	45	48	49	49			52	44	48	2.0
5:00	49	47	45	44	48	49	52	47	48	47	46	49	50	48			52	44	48	2.0
5:15	50	48		46	49	50	52	47	49	47	46	48	50	49			52	46	48	1.8
5:30	51	48	47	46	49	50	53	48	49	47	47	48	49	49			53	46	48	1.7
5:45	50	48		46	49	49	52	46	50	48	48	48	49	49			52	46	48	1.6
6:00	49	49	46	47	48	48	52	46	49	47	46	47	50	48			52	46	48	1.8
6:15	49	49	46	47	49	47	52	46	50	46	45	47	51	48			52	45	48	2.2
6:30	49	49	45	47	48	48	53	46	51	46	45	48	50	48			53	45	48	2.3
6:45	48	49		47	47	49	52	47	49	47	45	47	50	48			52	45	48	1.9
7:00	47	50	46	46	48	49	52	46	49	46	45	45	49	48			52	45	48	2.1
Max	51	52	49	47	49	50	53	50	51	51	50	50	51	51			53	47	50	1.4
Min	45	45	44	43	45	45	45	46	44	44	45	45	45	47			47	43	45	0.9
Ave	47	49	46	45	47	47	48	47	46	47	46	48	48	49			49	45	47	1.2
SD	1.6	1.7	1.4	1.0	1.2	1.5	2.9	0.9	2.0	1.8	1.1	1.0	1.4	1.1			2.9	0.9	1.5	0.5
90%	46	47	44	44	45	45	45	46	44	46	45	47	46	48			48	44	46	1.1
																		Median	45	

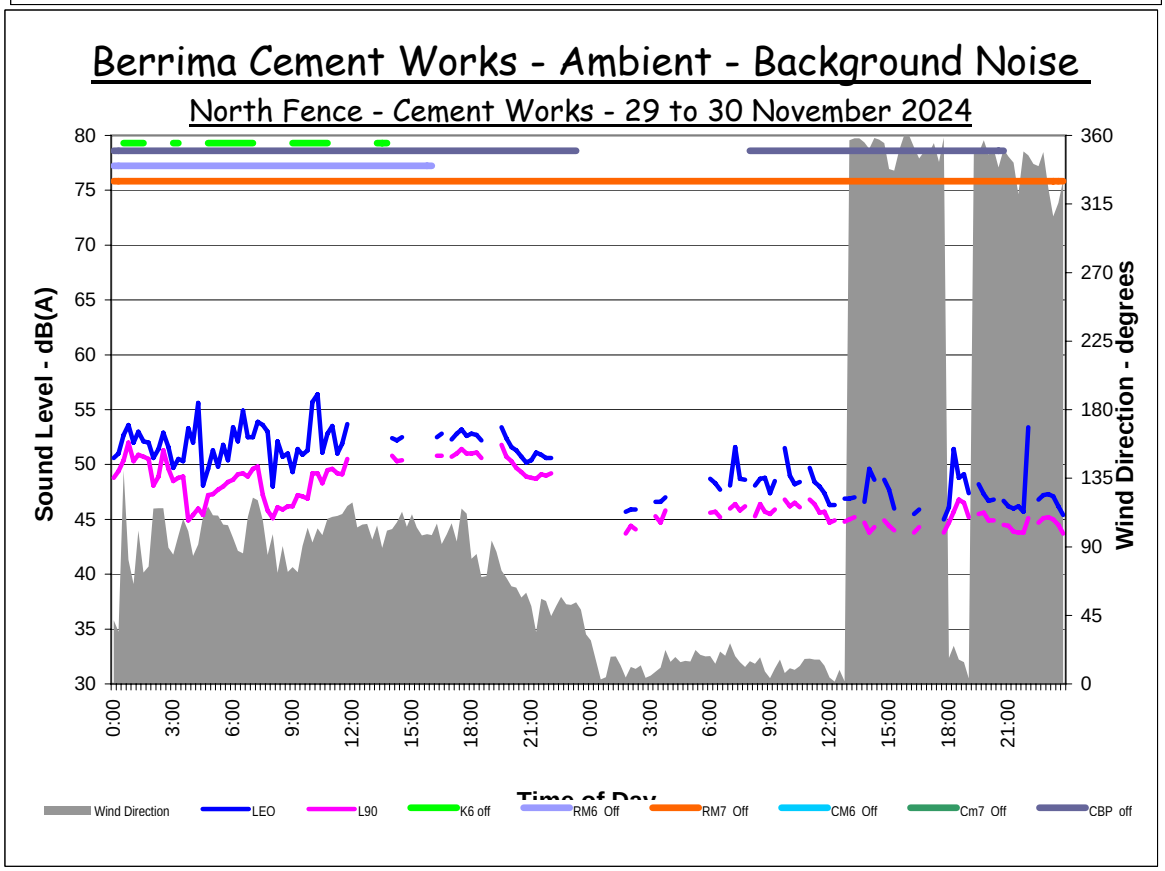
Two Day Results of Ambient Noise Monitoring



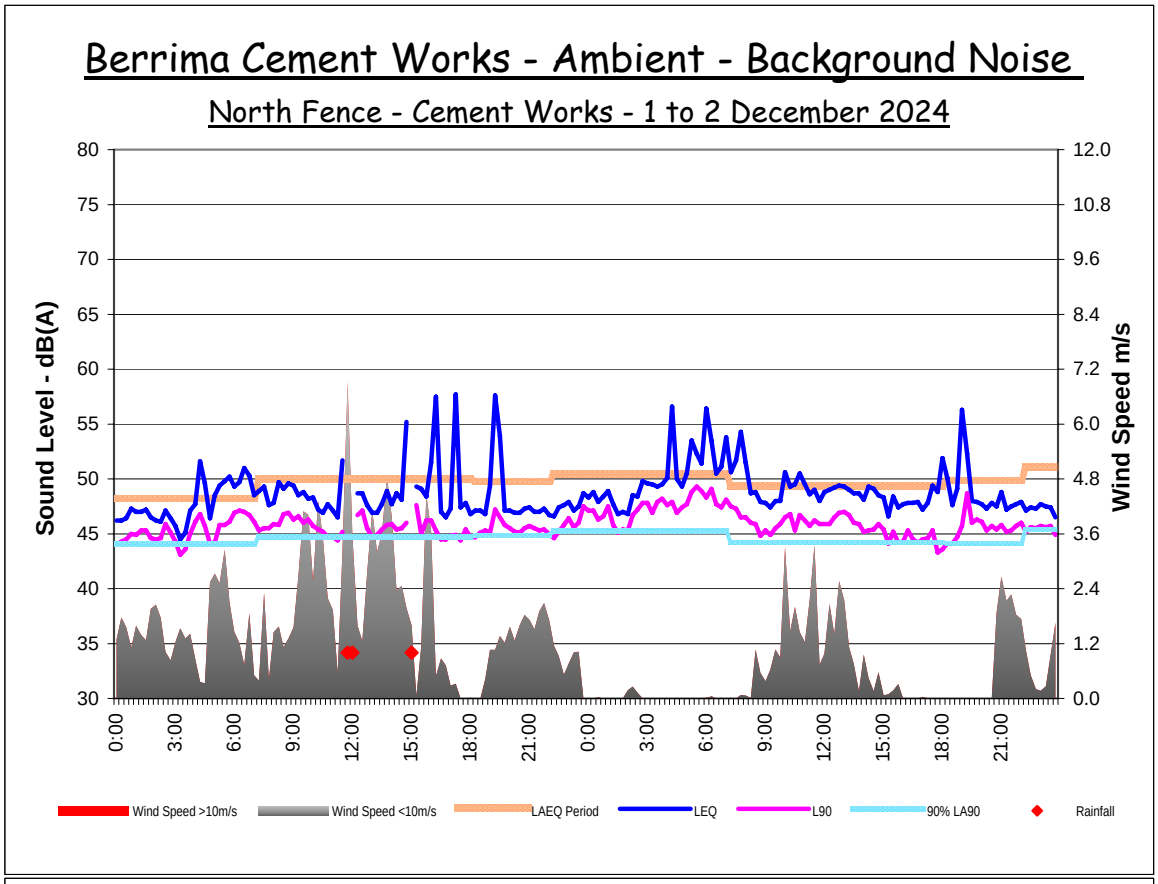


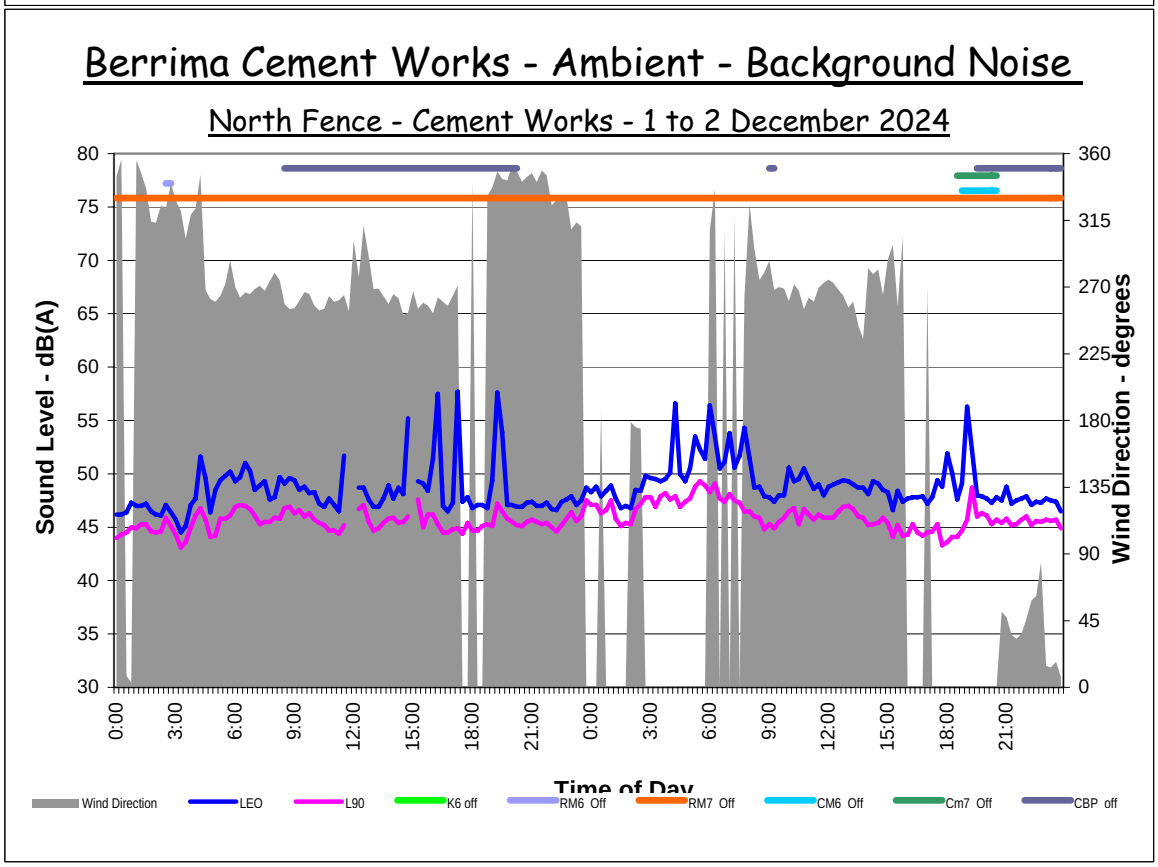
Two Day Results of Ambient Noise Monitoring



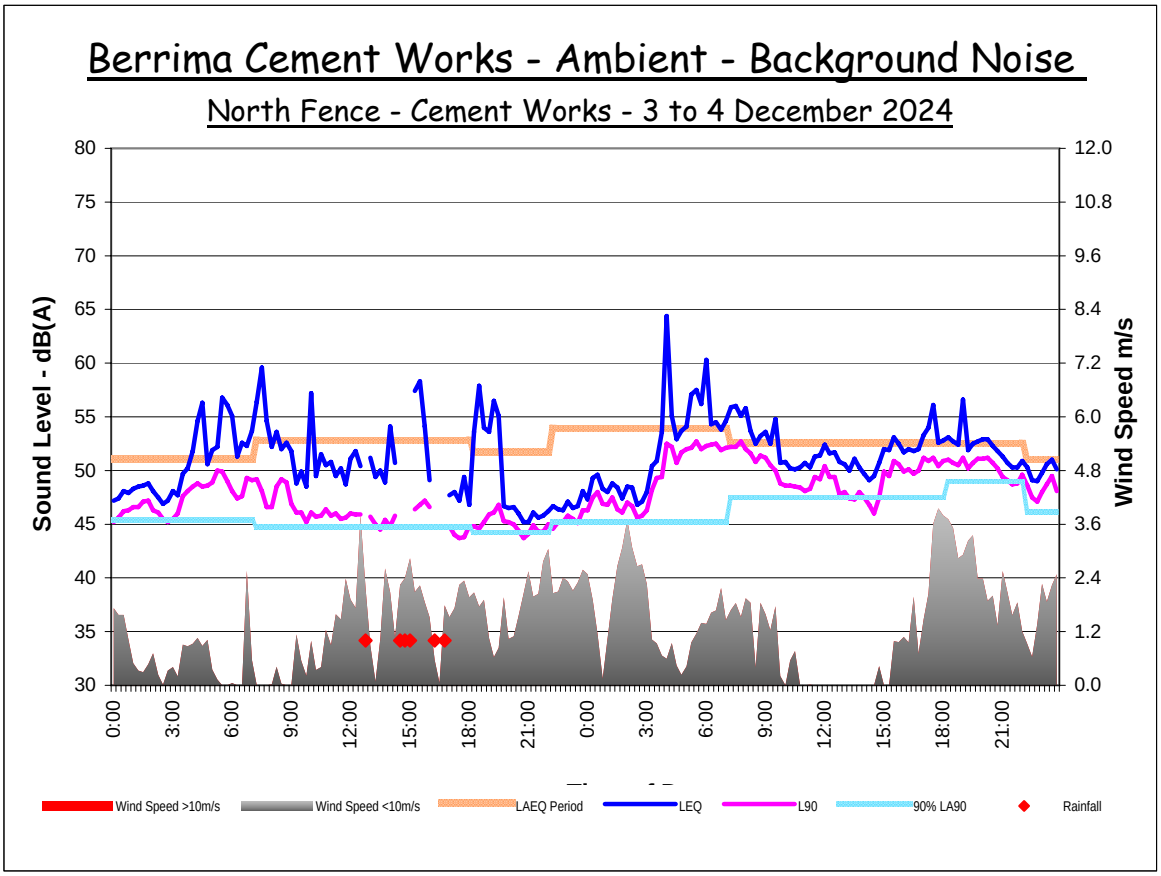


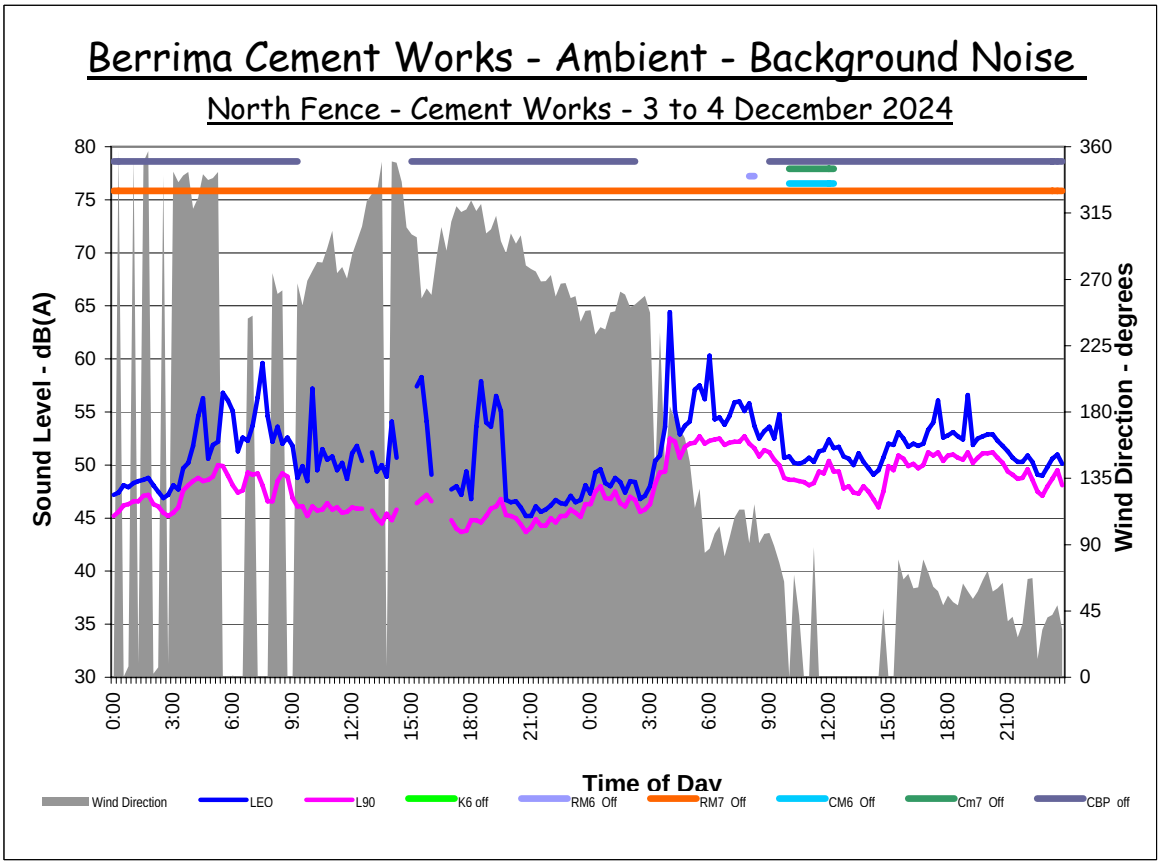
Two Day Results of Ambient Noise Monitoring



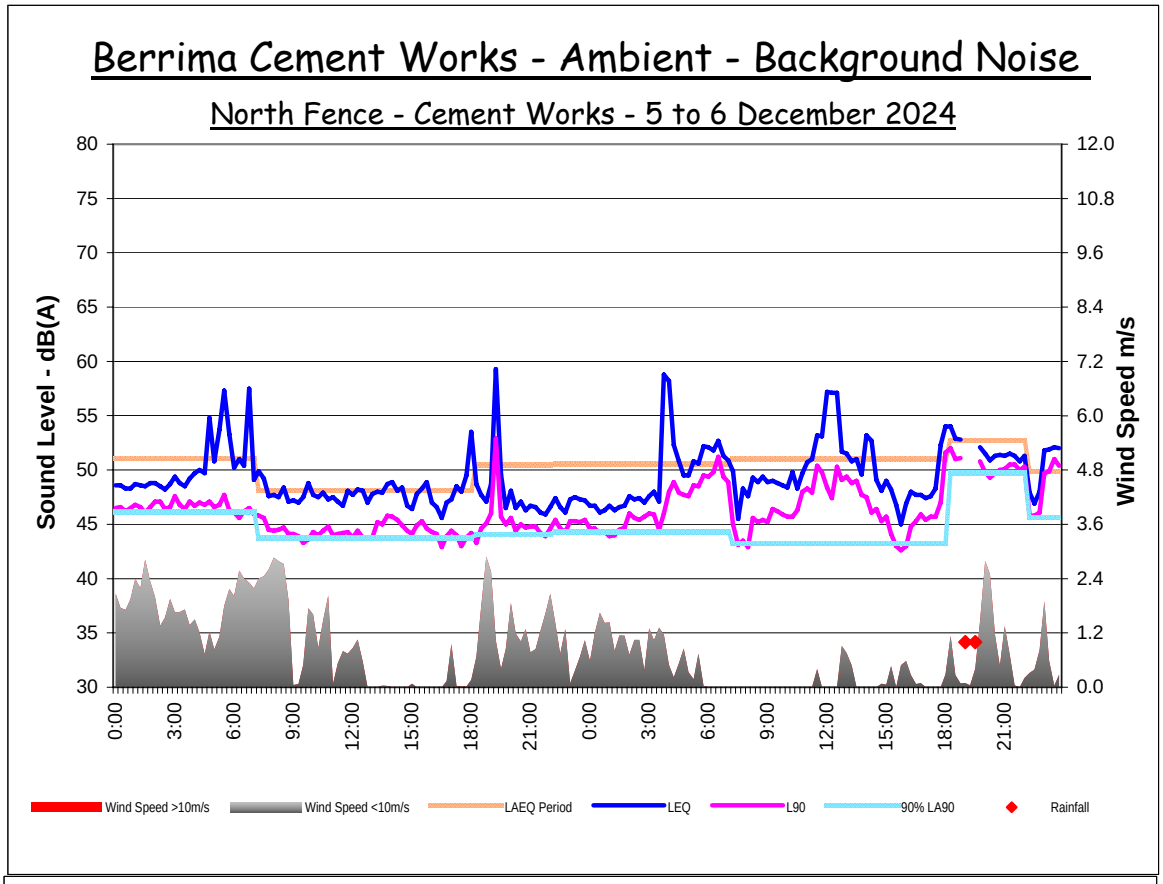


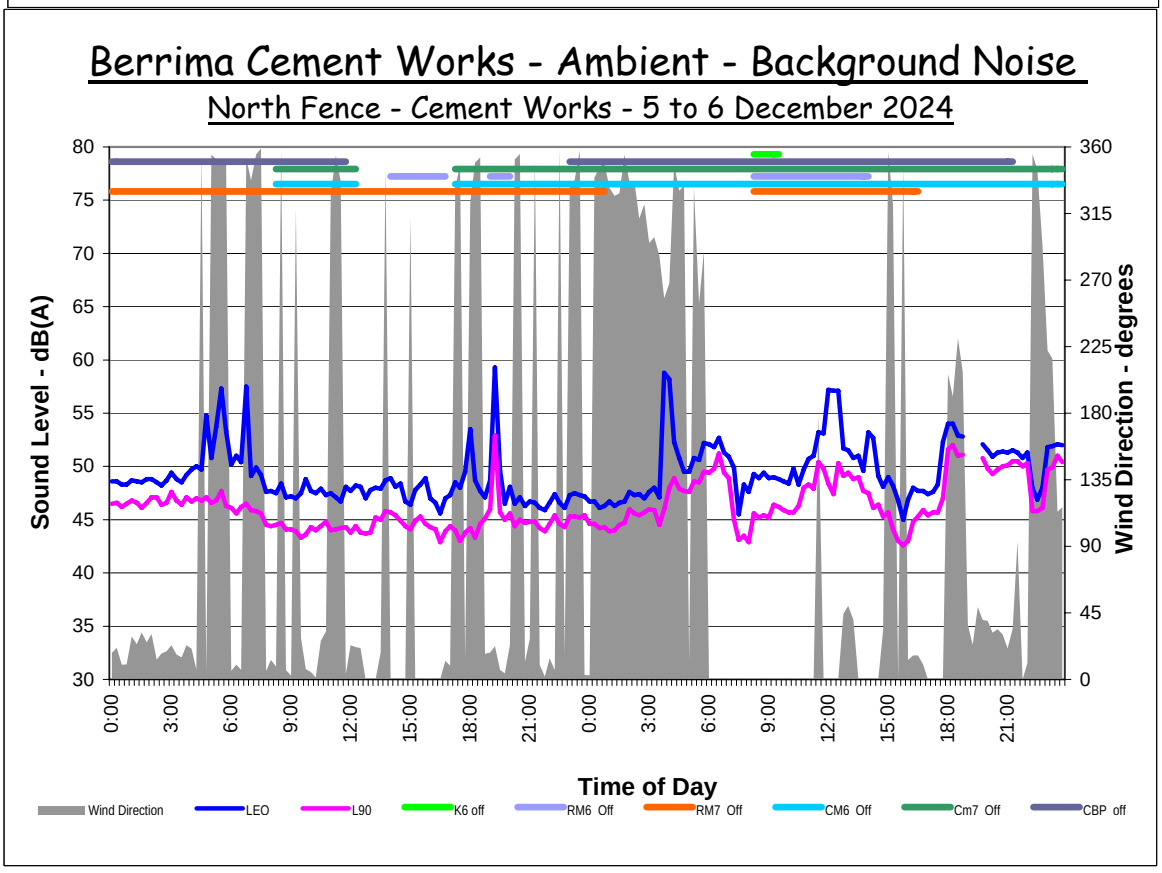
Two Day Results of Ambient Noise Monitoring



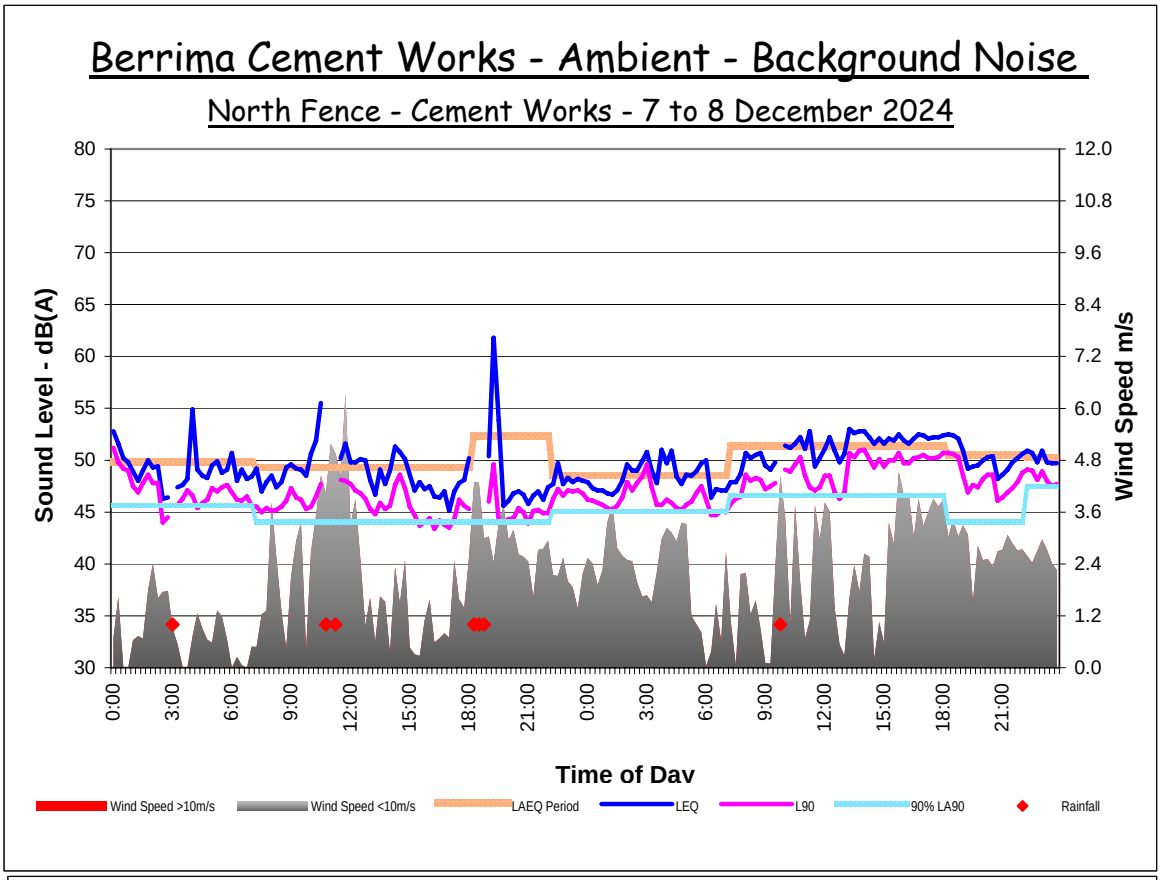


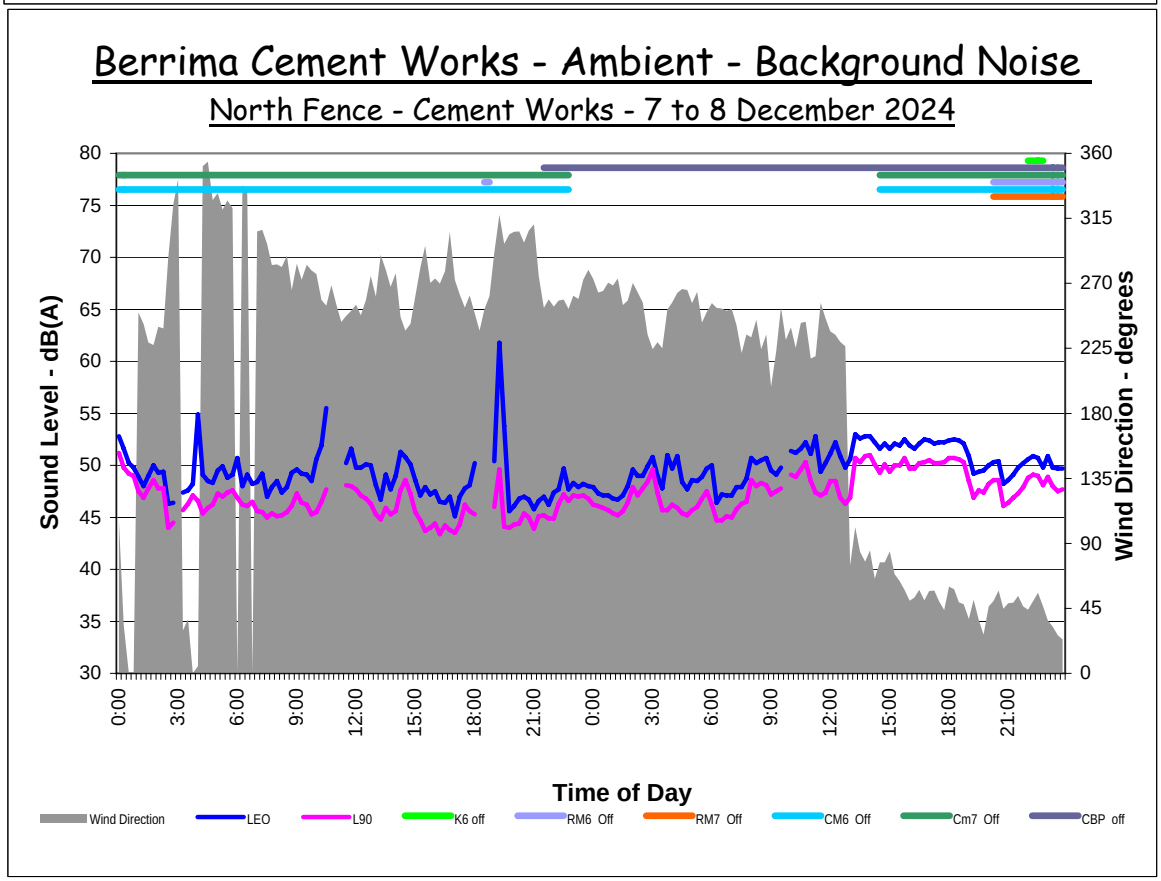
Two Day Results of Ambient Noise Monitoring



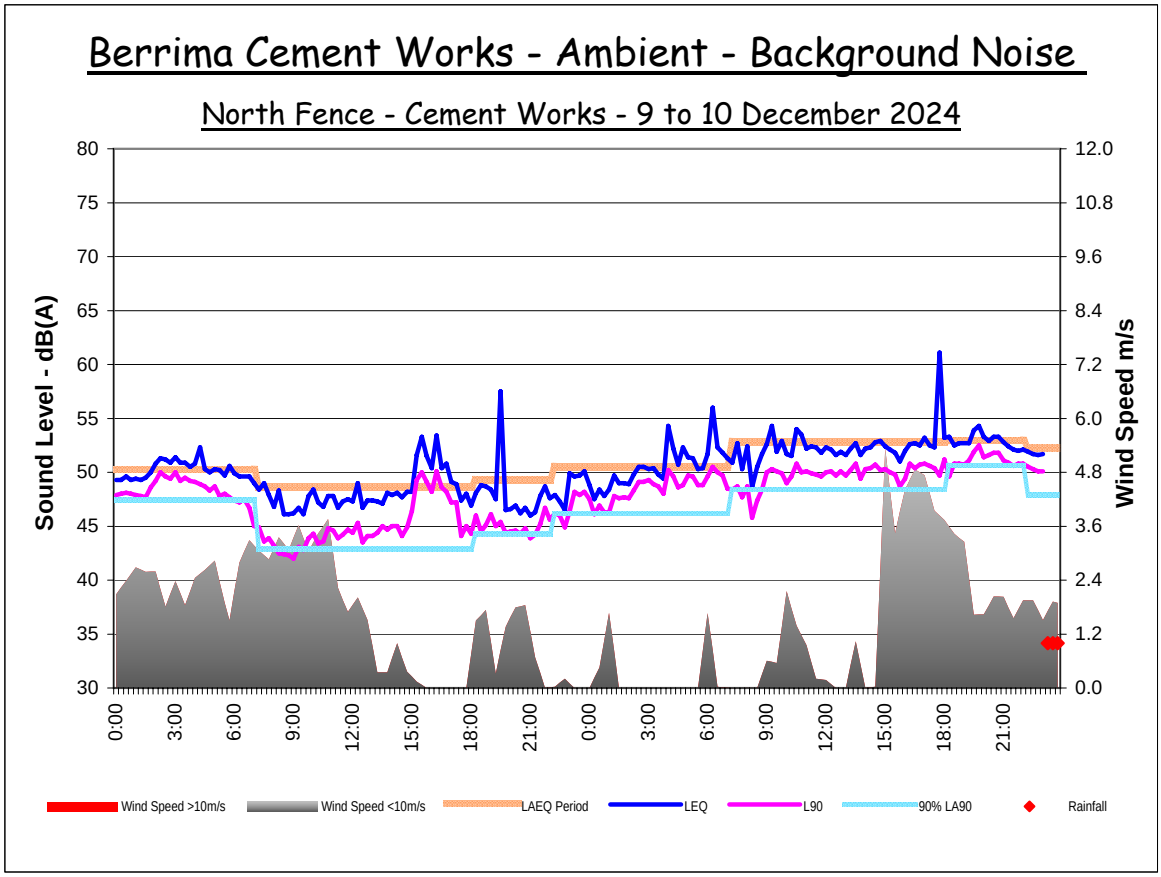


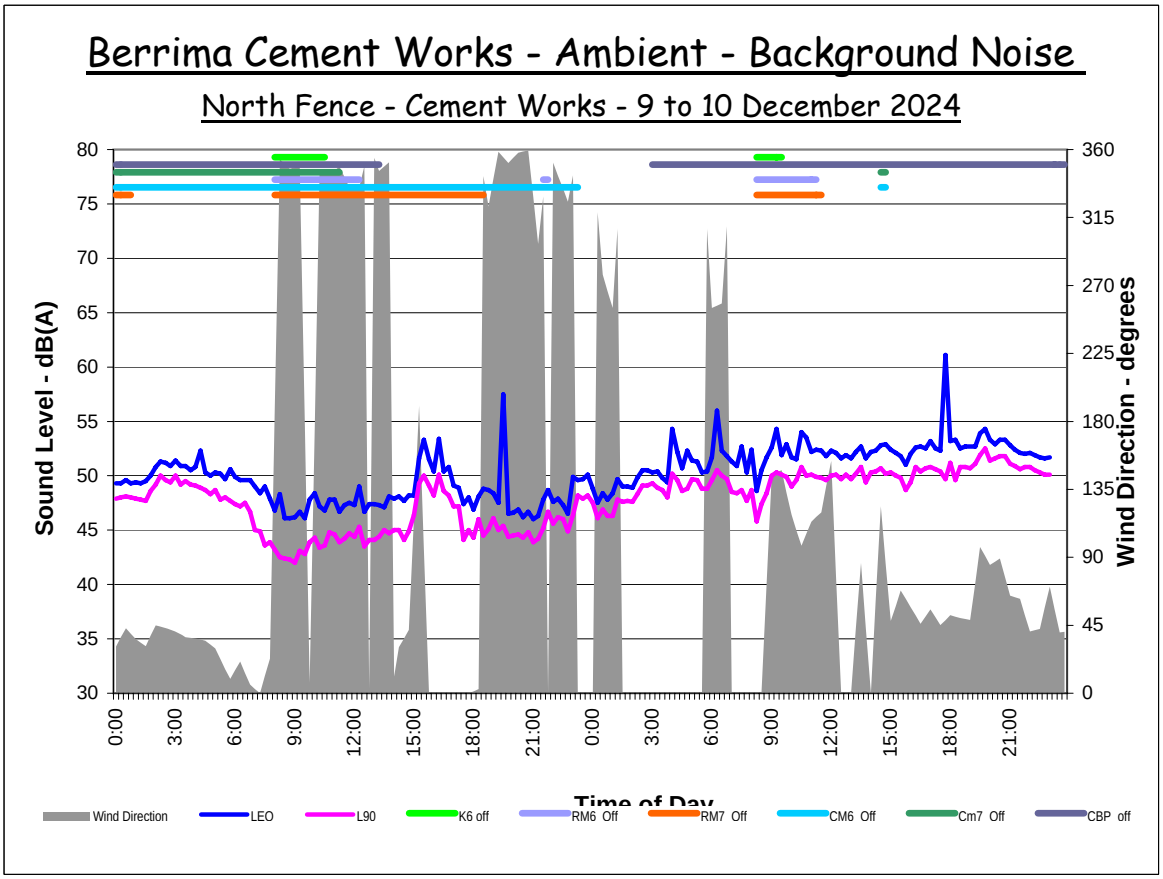
Two Day Results of Ambient Noise Monitoring

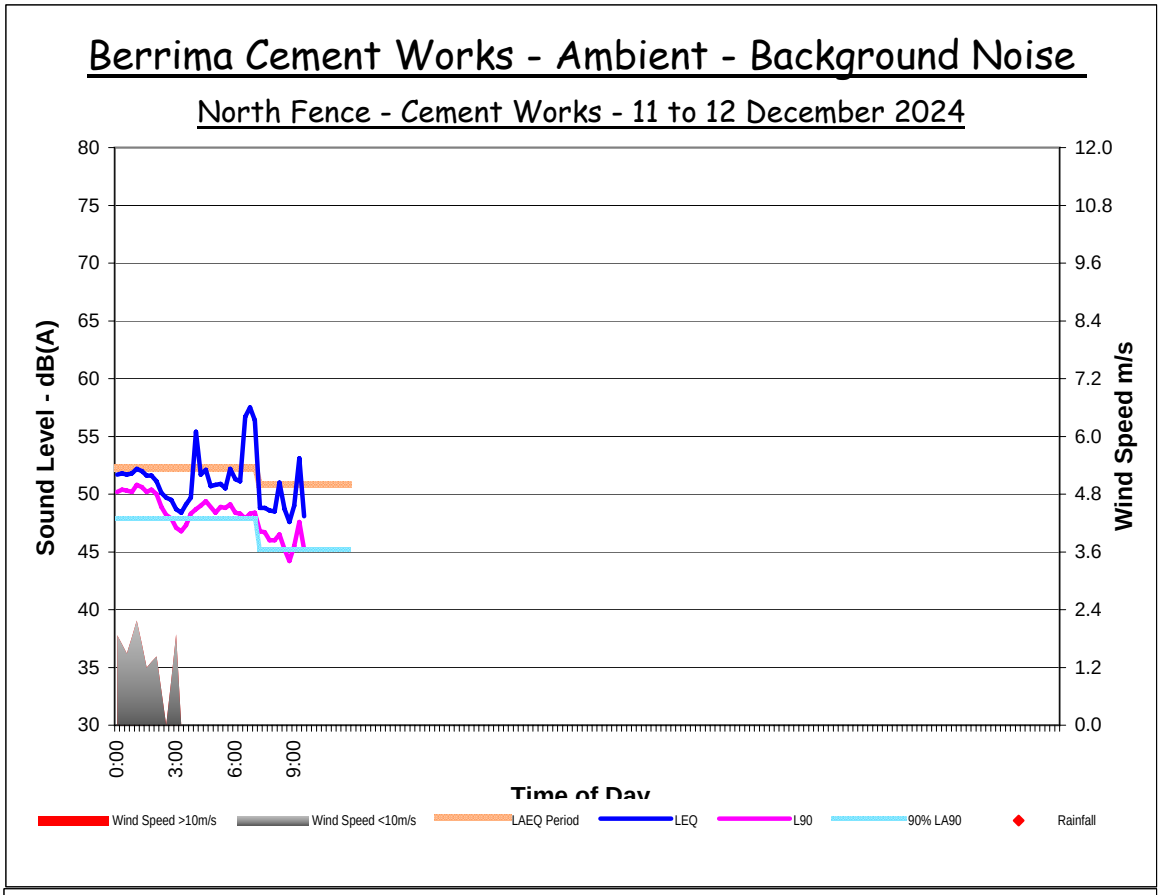


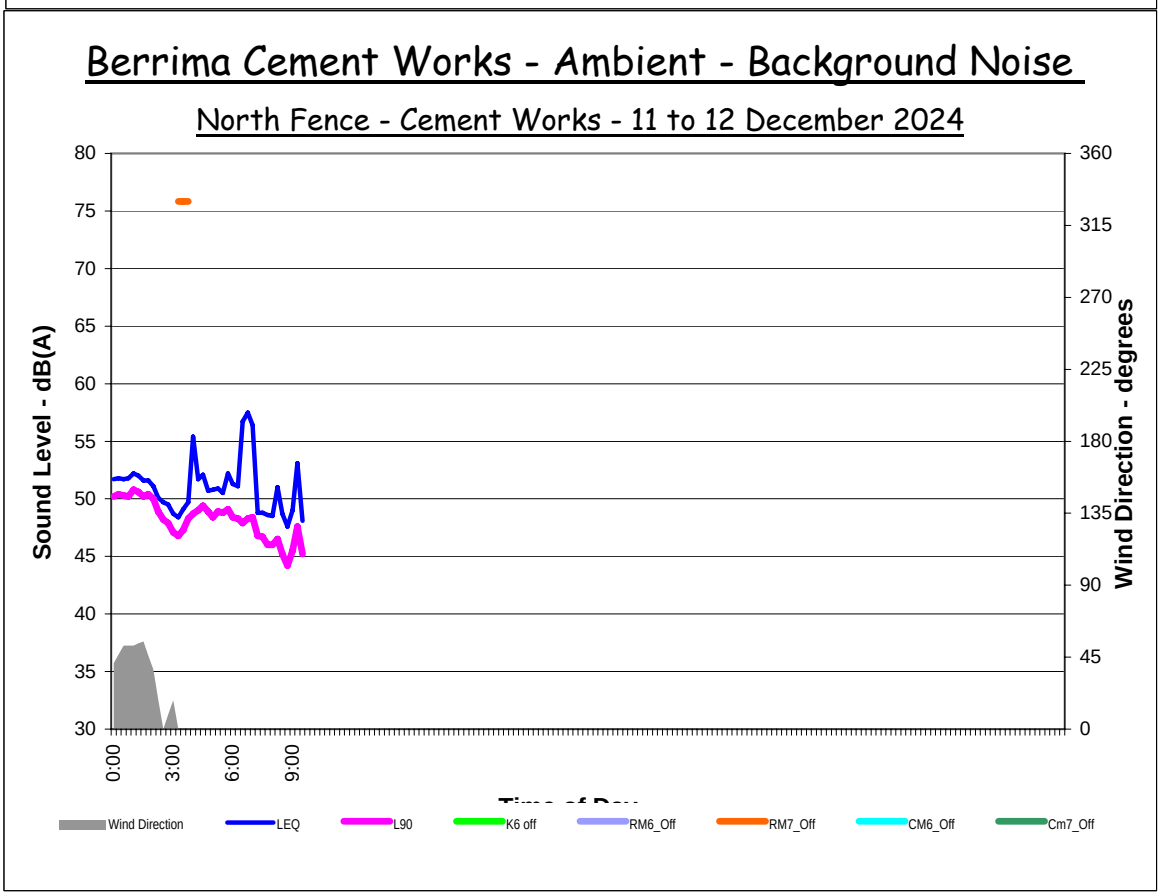


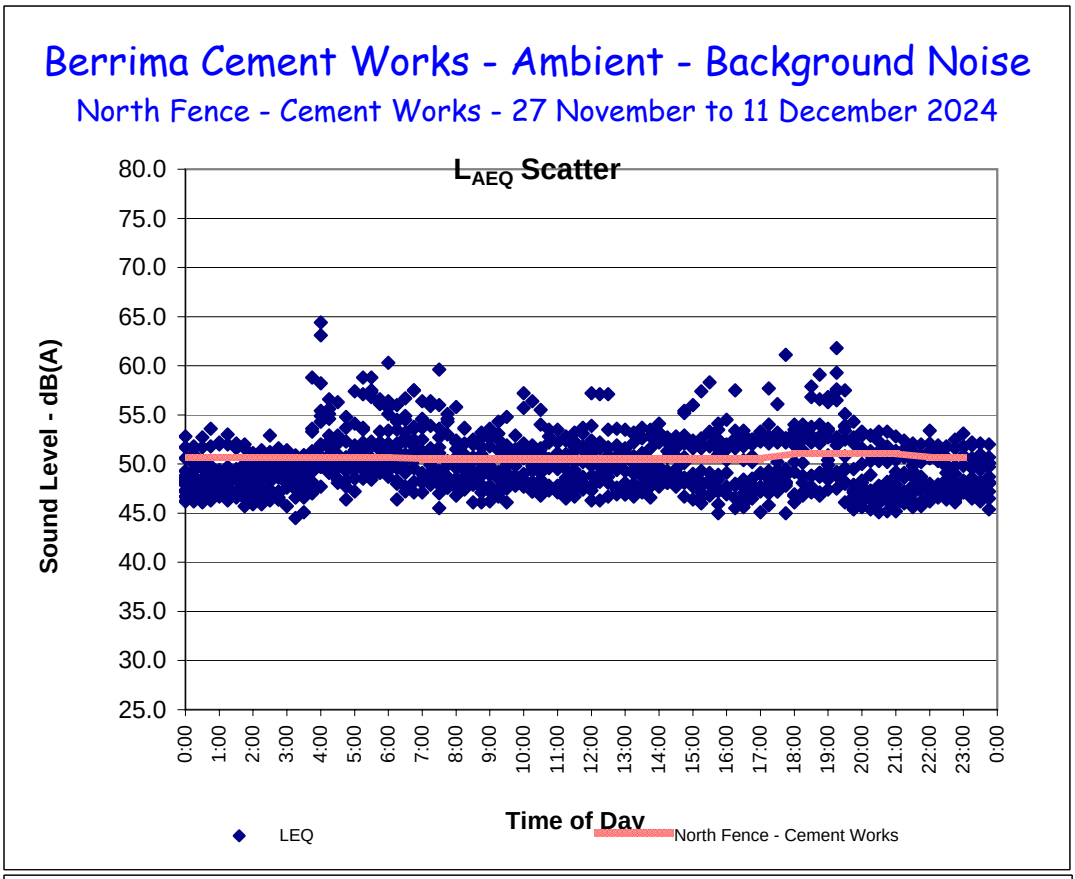
Two Day Results of Ambient Noise Monitoring

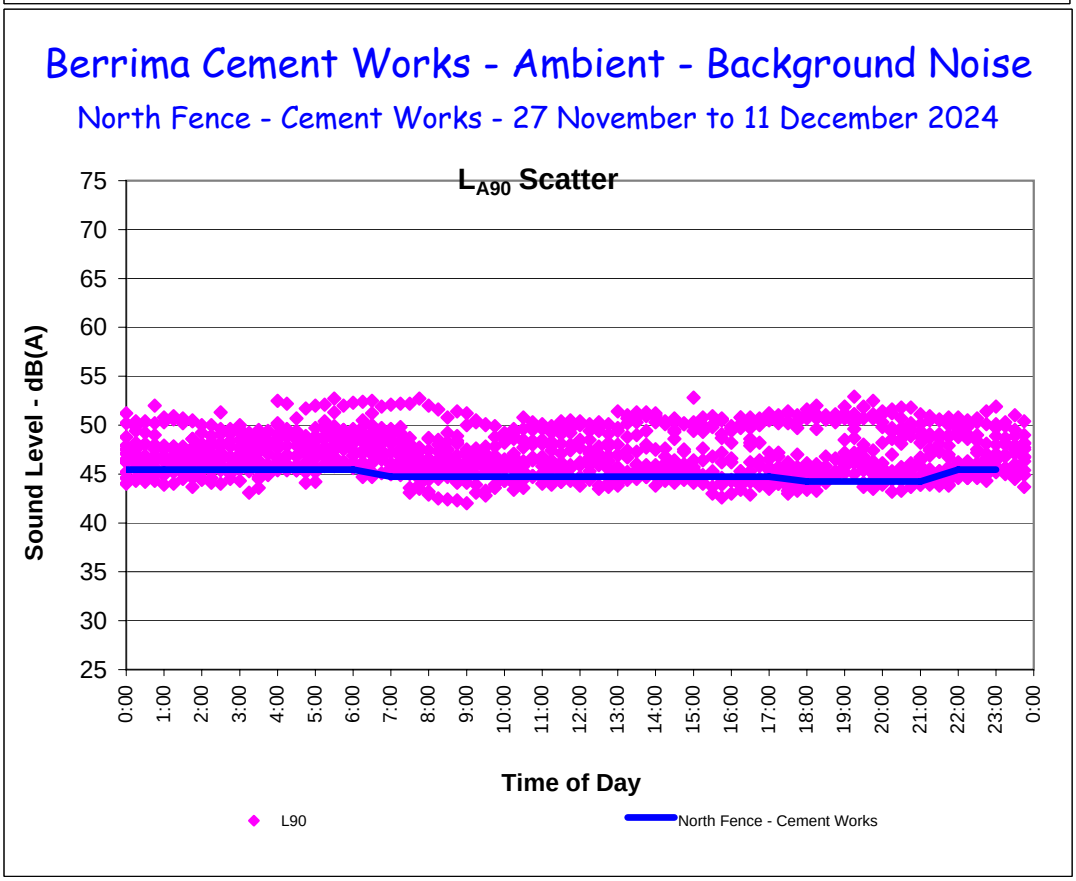


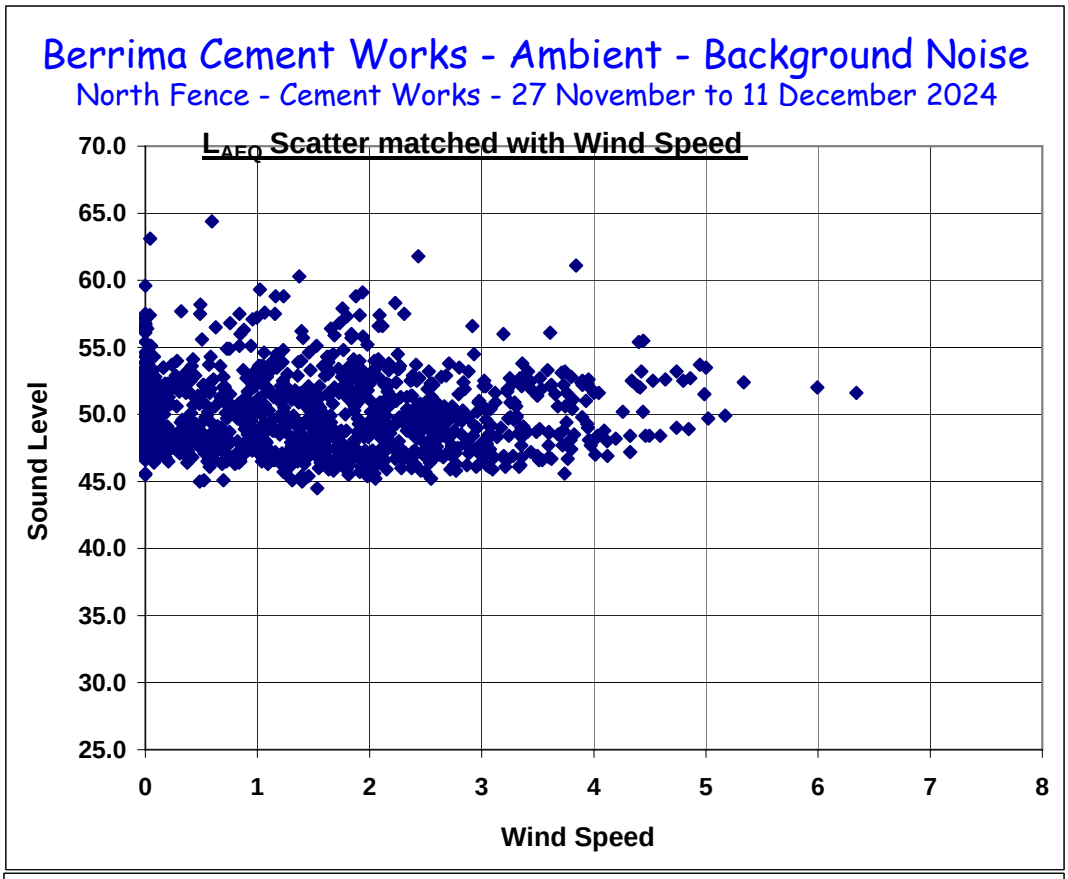


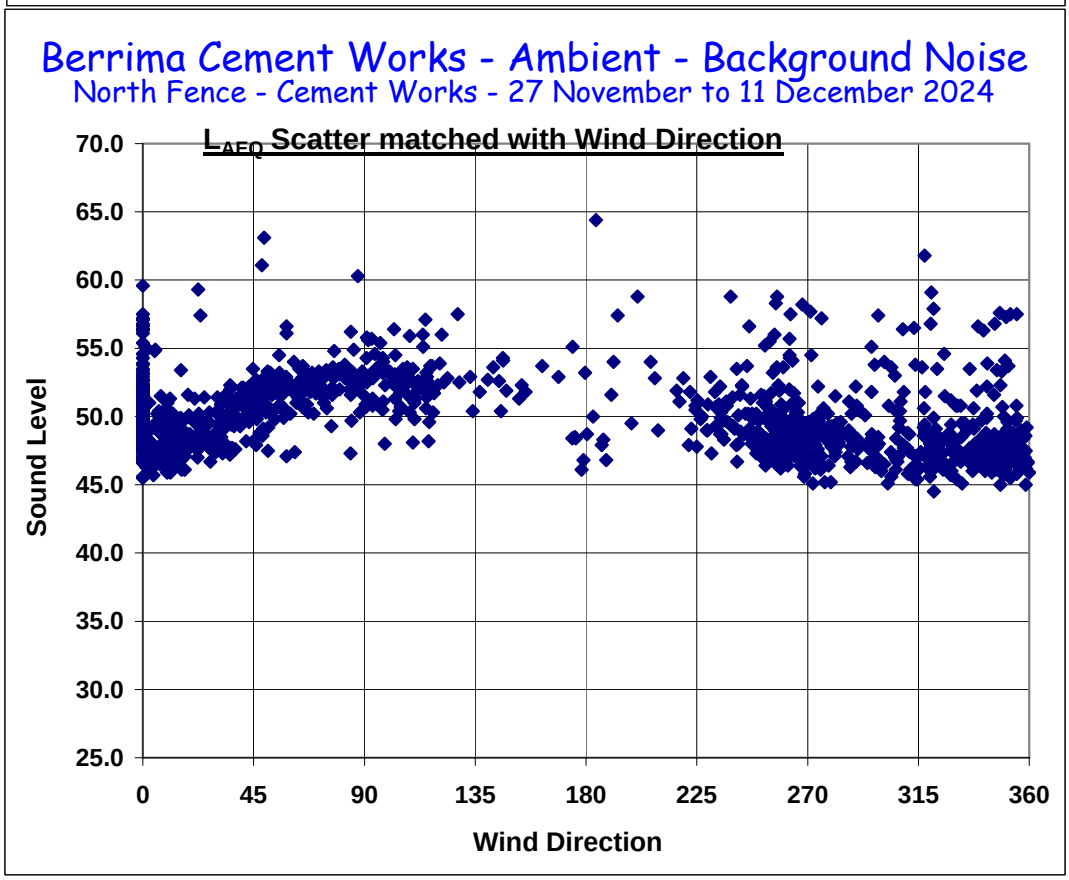

Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 11 to 12 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
Time of Day
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

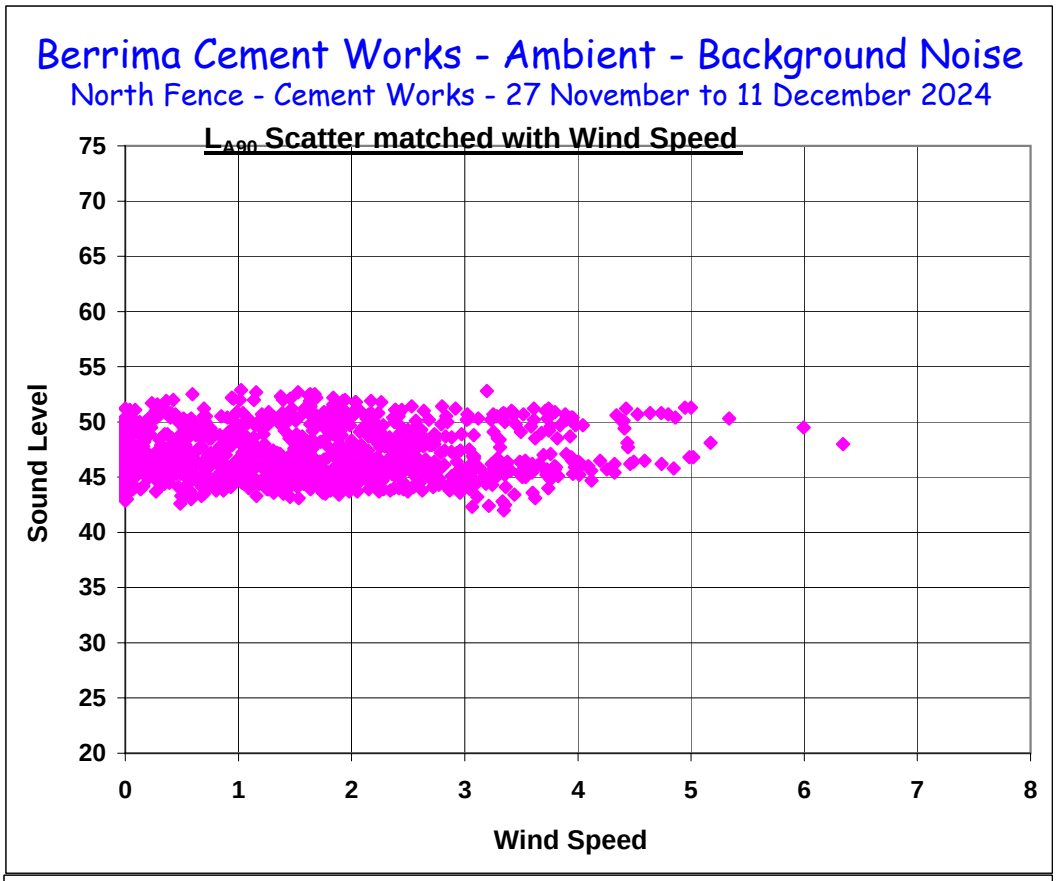

Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 11 to 12 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
Time of Day
Wind Direction
LEQ
L90
K6 off
RM6_Off
RM7_Off
CM6_Off
Cm7_Off

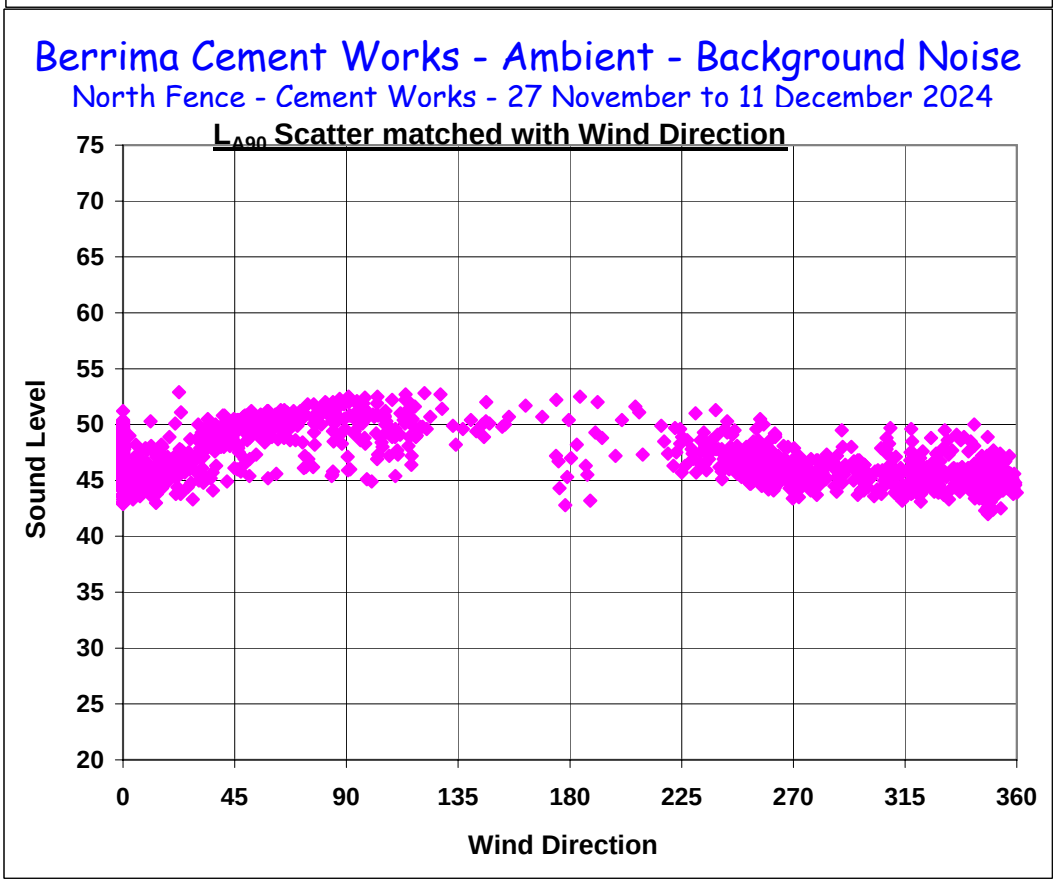

Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 27 November to 11 December 2024
L_{AEQ} Scatter
Sound Level - dB(A)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time of Day
LEQ
North Fence - Cement Works


Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 27 November to 11 December 2024
L_{A90} Scatter
Sound Level - dB(A)
75
70
65
60
55
50
45
40
35
30
25
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time of Day
L90
North Fence - Cement Works


Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 27 November to 11 December 2024
LAEQ Scatter matched with Wind Speed
Sound Level
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0
1
2
3
4
5
6
7
8
Wind Speed


Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 27 November to 11 December 2024
LAEQ Scatter matched with Wind Direction
Sound Level
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0
45
90
135
180
225
270
315
360
Wind Direction


Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 27 November to 11 December 2024
L_{A90} Scatter matched with Wind Speed
Sound Level
75
70
65
60
55
50
45
40
35
30
25
20
0
1
2
3
4
5
6
7
8
Wind Speed


Berrima Cement Works - Ambient - Background Noise
North Fence - Cement Works - 27 November to 11 December 2024
L_{A90} Scatter matched with Wind Direction
Sound Level
75
70
65
60
55
50
45
40
35
30
25
20
0
45
90
135
180
225
270
315
360
Wind Direction

ABN: 25 153 946 064
ACN: 153 946 064

Appendix D: Unattended environmental sound level results for Compliance Monitoring Location 20 - Store Yard Close

Location 20 - Cement Works

Daytime LAEQ **27 November to 11 December 2024**

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	*Maximum*	*Minimum*	*Average*	*SD*
7:00		58	57	54	55	59	57	57	60	58	57	54	60	57	58		60	54	57	1.9
7:15		59	58	54	56	59	57	59	59	58	56	51	59	59	58		59	51	57	2.4
7:30		57	60	53	58	58	60	62	61	62	57	51	58	60	57		62	51	58	3.1
7:45		58	57	59	55	57	59	58	58	59	55	52	60	58	58		60	52	57	2.2
8:00		58	60		55	60	56	58	58	59	56	52	57	59	59		60	52	58	2.2
8:15		56	57	53	55	58	56	59	57	55	54	52	58	57	55		59	52	56	1.9
8:30		60	59	54	54	57	58	61	56	53	54	53	60	57	55		61	53	56	2.8
8:45		57	57	55	54	58	57	59	57	57	55	54	57	59	57		59	54	57	1.6
9:00		58	56	53	54	57	55	58	54	53	54	54	57	59	59		59	53	56	2.2
9:15		58	59	54	54	57	58	58	58	58	55	54	58	54	57		59	54	57	2.0
9:30		58	58		55	58	59	58	57	57	53	55	55	55	56		59	53	56	1.7
9:45		57	54	54	54	55	57	58	57	56	55		56	57	58		58	54	56	1.5
10:00		58	57	53	54	57	57	59	54	58	57	54	54	58	55		59	53	56	2.0
10:15		58	57	55	55	56	56	58	54	57	54	54	53	57	61		61	53	56	2.0
10:30		57	57	58	54	56	58	56	60	57	55	54	57	59	56		60	54	57	1.8
10:45		60	59		53	57	58	55	57	57		55	56	58	56		60	53	57	1.8
11:00		59	59	54	54	57	57	56	58	58	54	56	58	59	57		59	54	57	1.8
11:15		59	59	53	54	55	55	54	57	58		56	57	58	59		59	53	56	2.1
11:30		59	56	58	53	57	57	55	57	56	59	56	58	58	57		59	53	57	1.6
11:45		57	58	54		59	59	56	59	58	55	58	59	58			59	54	57	1.5
12:00		58		54		56	56	56	58	59	57	55	59	60			60	54	57	1.8
12:15		56	57	53	53	56	58	58	59	60	57	56	55	57			60	53	56	2.2
12:30		58			56	56	57	57	58	59	56	55	58	60			60	55	57	1.5
12:45		58		52	67	54		58	60	60	57	56	57	59			67	52	58	3.8
13:00		59		52	60	58	57	57	60	61	55	55	57	58			61	52	57	2.5
13:15		57		51	55	56	58	58	58	60	57	57	56	57			60	51	57	2.0
13:30		58			55	59	55	58	56	59	62	56	54	57			62	54	57	2.2
13:45		58		51	55	56	55	59	56	58	59	55	55	62			62	51	57	2.7
14:00		59	56	52	54	58	56	57	59	58	57	54	54	57			59	52	56	2.1
14:15			57	53	54	56	57	55	57	58	57	56	56	59			59	53	56	1.7
14:30		57	57		56	57		56	58	58	56	56	55	56			58	55	57	0.8
14:45		57		52	54	57		58	56	56	54	56	56	56			58	52	56	1.7
15:00		58		54		56		58	56	56	54	56	59	58			59	54	56	1.8
15:15			57	52	54	55	56	55	55	56	57	56	56	57			57	52	55	1.5
15:30					54	56	56	58	55	54	56	55	58	56			58	54	56	1.4
15:45		60	56	52	59	55	55	59	54	55	55	56	59	58			60	52	56	2.4
16:00		59			57	56	55	60	54	53	55	56	56	57			60	53	56	2.0
16:15		68	57	52	55	53		56	57	54	54	56	57	56			68	52	56	4.0
16:30		59	56	55	54	54	52	57	55	52	54	56	57	56			59	52	55	2.0
16:45	54	57			54	53		56	55	54	55	56	55	56			57	53	55	1.2
17:00	57	57	56		55	53	52	56	54	54	53	56	56	56			57	52	55	1.7
17:15	55	56	55	52	54	55	53	56	53	56	53	56	56	57			57	52	55	1.5
17:30	54	55	55		55	53	57	56	53	54	53	56	55	56			57	53	55	1.4
17:45	54	54	57	56	56	53	53	56	54	54	53	56	55	56			57	53	55	1.6
18:00	54	56	57	52	54	53	52	56	53	54	53	56	54	56			57	52	54	1.7
Max	57	68	60	59	67	60	60	62	61	62	62	58	60	62	61		68	57	61	2.9
Min	54	54	54	51	53	53	52	54	53	52	53	51	53	54	55		55	51	53	1.2
Ave	55	58	57	54	55	56	56	57	57	57	55	55	57	57	57		58	54	56	1.2
SD	1.2	2.0	1.3	1.9	2.4	1.9	2.0	1.7	2.1	2.4	1.9	1.6	1.7	1.5	1.6		2.4	1.2	1.8	0.3
E Ave	55	59	57	54	56	57	57	58	57	57	56	55	57	58	58		59	54	57	1.2

Evening LAEQ

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	*Maximum*	*Minimum*	*Average*	*SD*
18:00	54	56	57	52	54	53	52	56	53	54	53	56	54	56			57	52	54	1.7
18:15	55	54	58	52	54	54	52	56	55	54		56	54	56			58	52	55	1.7
18:30	55	56	58	52	53	55	53	56	53	54		56	53	56			58	52	55	1.8
18:45	54	54		52	54	51	52	56	53	56		56	55	56			56	51	54	1.9
19:00	55	54	57	52	54	50	52	58	53		54	56	55	57			58	50	54	2.1
19:15		54			53	50	52	57	53	57	56	56	56	56			57	50	55	2.2
19:30	54	54	56	55	53	52	52	57	53		56	56	53	56			57	52	54	1.7
19:45	57	54	56	57	53	51	52	56	53	56	58	56	54	56			58	51	55	2.1
20:00	54	54	57	54	53	52	53	56	54	57	55	56	54	57			57	52	55	1.4
20:15	55	54	57	55	55		55	56	56	57	56	55	54	56			57	54	56	1.0
20:30	56	56	56		54	52	54	56	54	57	54	55	54	57			57	52	55	1.5
20:45	54	53	56	54	54	54	51	56	53	56	54	55	53	58			58	51	54	1.7
21:00	54	53	55	54	53	53	51	57	53	56	53	55	54	57			57	51	54	1.6
21:15	54	53	55	54	54	53	52	56	53	56	54	55	54	57			57	52	54	1.5
21:30	55	52	54	54	54	53	51	56	53	56	54	55	54	57			57	51	54	1.5
21:45	55	53	54	54	54	53	51	56	53	55	52	54	54	57			57	51	54	1.5
22:00	55	54	54	54	54	54	51	56	53	57	51	54	53	57			57	51	54	1.8
Max	57	56	58	57	55	55	55	58	56	57	58	56	56	58			58	55	57	1.0
Min	54	52	54	52	53	50	51	56	53	54	51	54	53	56			56	50	53	1.7
Ave	55	54	56	54	54	53	52	56	54	56	54	55	54	57			57	52	55	1.4
SD	0.9	1.1	1.3	1.5	0.5	1.4	1.2	0.5	0.8	0.9	1.7	0.8	0.7	0.5			1.7	0.5	1.0	0.4
E Avg	55	54	56	54	54	53	52	56	54	56	55	56	54	57			57	52	55	1.4

Night LAEQ

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	*Maximum*	*Minimum*	*Average*	*SD*
22:00	55	54	54	54	54	54	51	56	53	57	51	54	53	57			57	51	54	1.8
22:15	54	54			54	53	51	56	53	56	52	54	53	56			56	51	54	1.5
22:30	54	54	54	54	54	53	51	55	53	56	52	55	54	56			56	51	54	1.4
22:45		55		53	54	54	51	55	53	55	51	55	54	56			56	51	54	1.6
23:00	54	56		60	54	53	51	56	53	56	52	55	54	56			60	51	55	2.3
23:15	54	55		55	54	53	52	55	54	54	53	56	55				56	52	54	1.1
23:30	56	56		54	54	53	52	56	54	54	56	56	54				56	52	55	1.3
23:45	54	56		55	54	54	51	55	54	54	54	55	54				56	51	54	1.1
0:00	54	56		55	54	54	52	55	54	56	54	56	56	56			56	52	55	1.3
0:15	56	56		55	54	53	52	56	54	57	54	55	57	56			57	52	55	1.5
0:30	55	55	58	54	54	54	53	56	54	56	55	55	56	57			58	53	55	1.4
0:45	55	55		54	54	53	53	55	54	57	55	55	56	56			57	53	55	1.1
1:00	55	55		54	55	53	53	55	54	57	54	55	55	56			57	53	55	1.1
1:15	56	55		54	55	53	54	55	54	57	54	55	55	56			57	53	55	1.1
1:30	55	56		54	55	53	56	55	54	55	53	55	55	56			56	53	55	0.9
1:45	55	57	54	56	55	54	53	55	54	55	53	55	55	56			57	53	55	1.1
2:00	54	56	54	54	55	54	54	56	54	55	54	55	55	57			57	54	55	0.9
2:15	54	57	53	54	54	53	53	57	54	54	54	55	56	56			57	53	55	1.3
2:30	54	56		54	53	54	54	55	54	55	54	55	56	57			57	53	55	1.0
2:45	53	56	52	55	54	54	52	55	54	55	54	55	55	56			56	52	54	1.3
3:00	52	55		54	54	53	52	55	54		55	56	55	56			56	52	54	1.3
3:15	53	56	52	54	55	53	55	55	54	55	55	56	57	55			57	52	55	1.4
3:30	56	59	52	55	55	55	52	56	56	53	54	57	57	56			59	52	55	1.9
3:45	54	57	52	54	58	53	54	55	55	54	57	56	56	58			58	52	55	1.8
4:00	54	53		54	57	55	53	57	55	54	56	57	56	55			57	53	55	1.6
4:15	54	56		53	57	54	54	58	58	54	55	57	56	56			58	53	56	1.7
4:30	56	55		53	57	55	54	55	55	54	54	56	56	55			57	53	55	1.0
4:45	56	52		54	58	58	54	58	57	54	54	55	57	56			58	52	56	1.9
5:00	58	58	53	55	56	56	58	56	56	57	54	56	56	57			58	53	56	1.4
5:15	56	56		55	56	55	57	58	59	55	54	55	57	57			59	54	56	1.4
5:30	56	52	54	54	55	55	55	58	56	55	54	55	56	57			58	52	55	1.4
5:45	56	56		53	56	55	58	58	56	56	54	56	57	56			58	53	56	1.5
6:00	58	59	53	54	57	56	58	58	58	55	54	58	59	57			59	53	57	2.0
6:15	59	60	54	56	59	58	57	59	59	58	54	58	57	57			60	54	58	1.8
6:30	60	61	54	55	62	56	59	60	59	55	54	59	60	57			62	54	58	2.9
6:45	60	58		56	60	59	60	58	62	56	55	58	58	59			62	55	58	2.0
7:00	58	57	54	55	59	57	57	60	58	57	54	60	57	58			60	54	57	1.9
Max	60	61	58	60	62	59	60	60	62	58	57	60	60	59			62	57	60	1.6
Min	52	52	52	53	53	53	51	55	53	53	51	54	53	55			55	51	53	1.2
Ave	55	56	54	55	55	54	54	56	55	55	54	56	56	56			56	54	55	1.0
SD	1.9	1.9	1.6	1.3	2.2	1.5	2.6	1.5	2.1	1.1	1.1	1.3	1.4	0.8			2.6	0.8	1.6	0.5
E Avg	56	56	54	55	56	55	55	57	56	55	54	56	56	57			57	54	55	0.9
24hr	55	57	57	54	55	56	55	57	56	57	55	55	56	57	57		57	54	56	0.9

Location 20 - Cement Works

Daytime LA90 **27 November to 11 December 2024**

Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
7:00		54	52	51	53	54	53	56	53	55	54	51	53	55	54		56	51	53	1.5
7:15		54	52	51	53	54	53	56	53	55	53	50	53	55	54		56	50	53	1.6
7:30		54	52	51	52	54	53	56	53	55	53	50	53	55	54		56	50	53	1.6
7:45		53	52	52	52	53	53	56	54	55	53	51	53	55	54		56	51	53	1.3
8:00		51	53		52	54	53	56	54	54	52	50	52	54	54		56	50	53	1.5
8:15		51	53	52	52	53	54	56	53	50	52	51	52	53	53		56	50	53	1.5
8:30		52	50	51	52	53	53	56	54	48	52	51	51	53	53		56	48	52	1.8
8:45		53	50	51	52	53	52	56	52	49	52	52	51	52	53		56	49	52	1.6
9:00		53	49	51	52	53	53	56	52	50	51	52	50	53	53		56	49	52	1.9
9:15		53	49	51	52	52	54	56	52	53	51	52	50	49	53		56	49	52	1.8
9:30		54	49		52	52	54	55	51	52	51	53	49	51	53		55	49	52	1.8
9:45		54	50	51	52	52	54	55	51	53	51		50	53	52		55	50	52	1.6
10:00		53	50	51	51	52	53	55	51	53	52	52	50	54	53		55	50	52	1.5
10:15		53	52	51	51	52	52	55	51	52	52	52	49	54	54		55	49	52	1.5
10:30		53	51	52	51	52	52	53	50	53	51	51	50	55	53		55	50	52	1.3
10:45		53	50		51	53	52	52	51	53		52	51	54	54		54	50	52	1.2
11:00		53	53	52	52	52	52	52	51	53	51	52	50	54	53		54	50	52	0.9
11:15		53	52	51	51	51	52	53	51	53		53	51	54	53		54	51	52	1.1
11:30		53	52	51	51	51	52	52	52	53	54	53	50	55	52		55	50	52	1.2
11:45		53	52	51		51	52	52	51	53	53	54	52	54			54	51	53	1.1
12:00		53		51		51	51	52	51	53	53	53	52	55			55	51	52	1.2
12:15		53	53	51	50	51	52	52	51	53	54	53	51	55			55	50	52	1.2
12:30		52			51	52	52	54	51	54	53	53	52	55			55	51	53	1.3
12:45		53		51	53	51		55	51	55	53	52	52	55			55	51	53	1.5
13:00		53		50	54	52	51	55	51	54	53	53	52	55			55	50	53	1.5
13:15		53		50	53	51	52	54	51	53	53	53	52	54			54	50	53	1.3
13:30		54			53	51	52	54	51	55	55	52	52	54			55	51	53	1.5
13:45		54		50	52	51	53	54	51	54	54	52	52	55			55	50	53	1.5
14:00		55	54	50	51	52	51	54	52	54	54	52	52	54			55	50	53	1.5
14:15			54	50	51	51	50	54	53	54	54	54	52	54			54	50	53	1.5
14:30		54	55		52	51		53	53	54	53	54	52	55			55	51	53	1.1
14:45		55		50	52	52		54	53	54	52	55	52	54			55	50	53	1.4
15:00		55		50		52		54	53	53	52	54	53	54			55	50	53	1.5
15:15			54	50	52	51	51	53	53	52	53	54	53	54			54	50	53	1.3
15:30					52	51	51	53	53	52	53	53	52	55			55	51	53	1.1
15:45		55	54	50	53	52	51	54	52	51	53	54	52	54			55	50	53	1.4
16:00		56			54	52	52	54	52	51	53	54	53	54			56	51	53	1.6
16:15		56	55	50	54	51		54	52	51	52	54	54	54			56	50	53	1.8
16:30		56	54	50	52	51	51	55	52	50	51	54	54	54			56	50	53	1.9
16:45	52	55			52	51		54	52	50	52	54	53	53			55	50	53	1.7
17:00	53	55	54		52	51	51	54	52	50	51	54	53	54			55	50	53	1.7
17:15	52	54	54	50	52	51	52	54	52	51	51	54	54	55			55	50	53	1.6
17:30	52	53	54		52	51	52	54	51	52	51	54	53	54			54	51	53	1.3
17:45	52	52	54	50	52	51	52	54	51	53	51	54	53	54			54	50	52	1.4
18:00	52	52	54	50	52	51	51	54	51	53	51	54	53	54			54	50	52	1.5
Max	53	56	55	52	54	54	54	56	54	55	55	55	54	55	54		56	52	54	1.1
Min	52	51	49	50	50	51	50	52	50	48	51	50	49	49	52		52	48	50	1.1
Ave	52	54	52	51	52	52	52	54	52	53	52	53	52	54	53		54	51	53	0.9
SD	0.5	1.2	1.9	0.6	0.8	0.9	0.9	1.2	1.0	1.7	1.1	1.3	1.3	1.0	0.5		1.9	0.5	1.1	0.4
90%	52	52	50	50	51	51	51	52	51	50	51	51	50	53	53		53	50	51	1.1
																		Median	51	

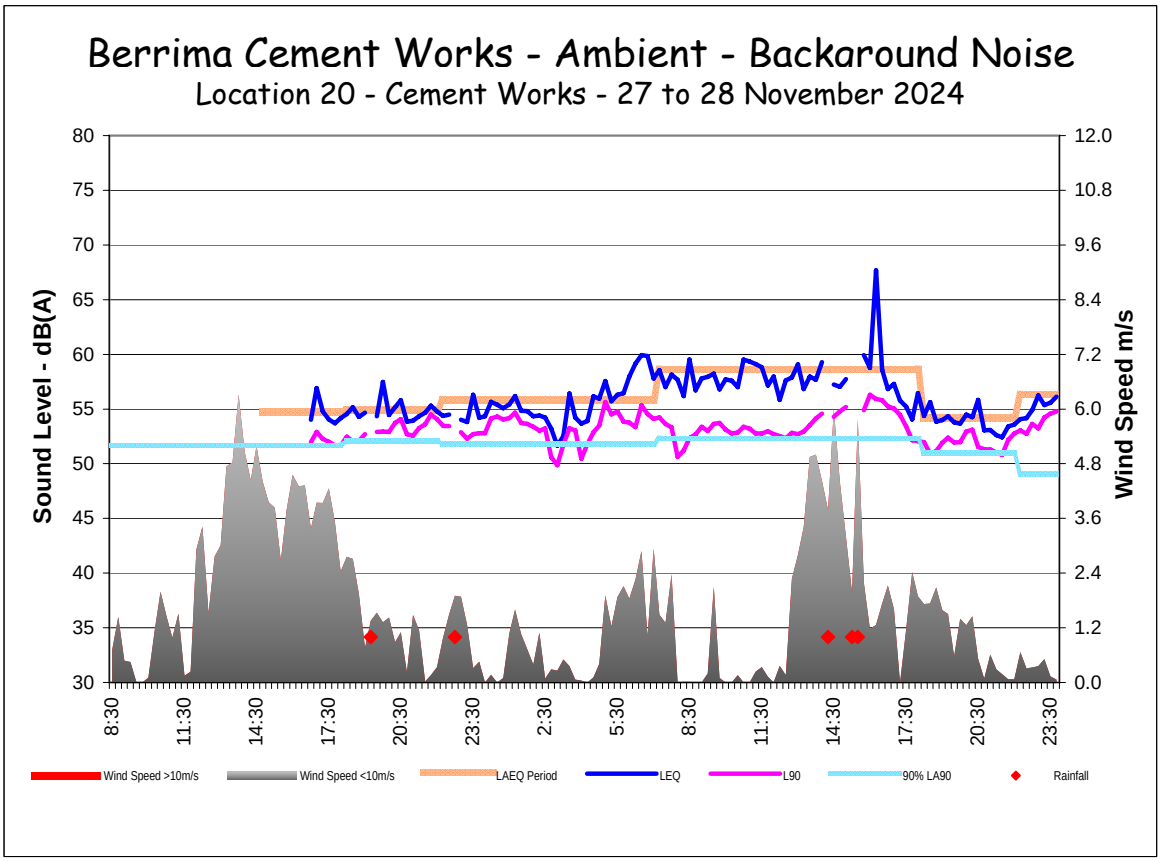
Evening LA90

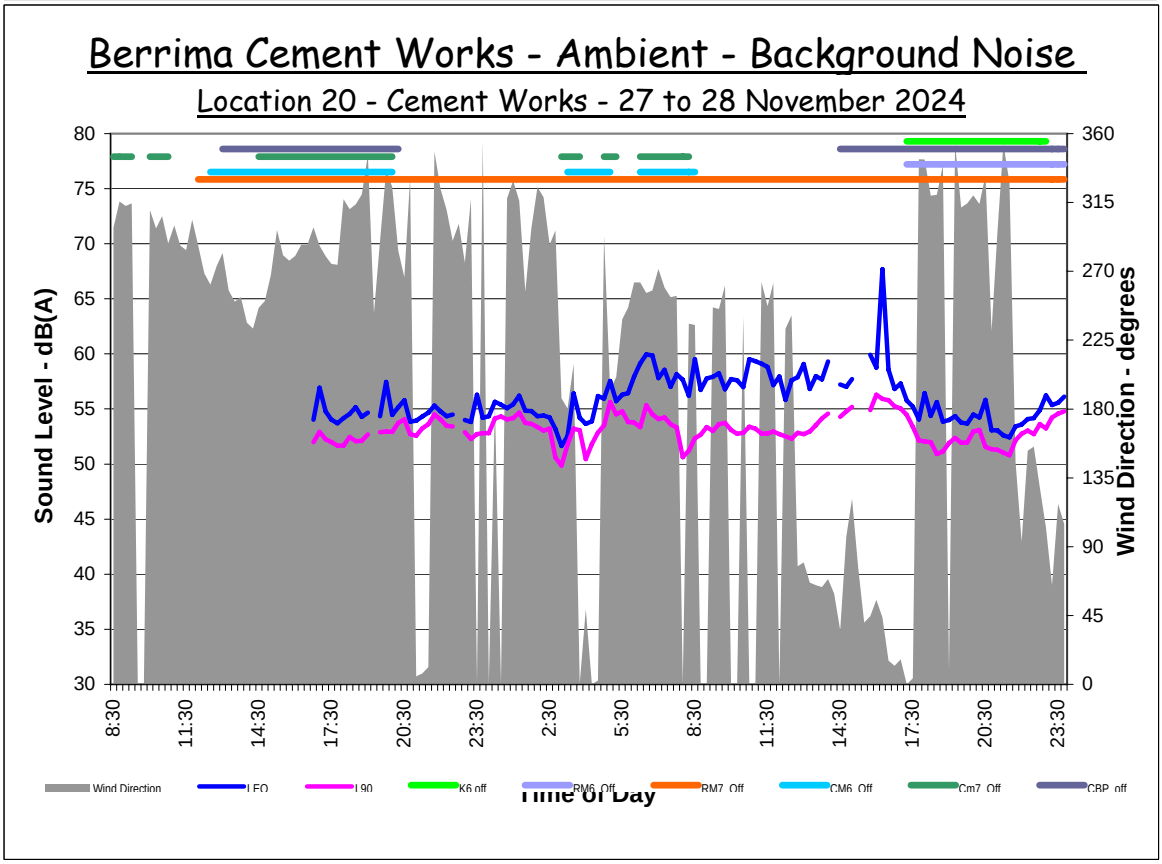
Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
18:00	52	52	54	50	52	51	51	54	51	53	51	54	53	54			54	50	52	1.5
18:15	52	52	55	51	52	51	51	54	51	53		54	53	55			55	51	53	1.5
18:30	52	51	55	50	52	52	51	54	51	53		54	51	54			55	50	52	1.7
18:45	52	51		51	53	49	51	54	51	53		54	52	54			54	49	52	1.7
19:00	53	52	55	51	52	49	51	55	51		52	55	52	55			55	49	52	1.9
19:15		52			52	50	51	54	51	55	54	55	52	54			55	50	53	1.8
19:30	53	52	54	54	52	49	51	55	52		55	54	52	55			55	49	53	1.8
19:45	53	52	55	53	52	49	51	55	52	55	54	54	52	55			55	49	53	1.8
20:00	53	53	56	52	52	51	52	54	52	55	53	54	52	55			56	51	53	1.4
20:15	54	53	56	53	54		51	54	55	55	54	52	52	55			56	51	54	1.3
20:30	54	52	55		52	50	51	54	52	55	52	53	52	56			56	50	53	1.8
20:45	53	51	54	53	52	52	50	55	52	55	51	54	52	56			56	50	53	1.7
21:00	53	51	54	52	52	52	51	55	52	54	52	53	52	55			55	51	53	1.5
21:15	53	51	54	53	52	51	51	55	52	54	52	54	52	55			55	51	53	1.5
21:30	54	51	53	52	52	52	50	55	52	54	52	54	52	56			56	50	53	1.5
21:45	54	52	53	52	52	51	50	55	52	54	51	52	52	55			55	50	52	1.5
22:00	54	53	53	52	52	52	50	54	52	54	50	52	52	55			55	50	52	1.5
Max	54	53	56	54	54	52	52	55	55	55	55	55	53	56			56	52	54	1.3
Min	52	51	53	50	52	49	50	54	51	53	50	52	51	54			54	49	52	1.5
Ave	53	52	54	52	52	51	51	54	52	54	52	54	52	55			55	51	53	1.4
SD	0.8	0.7	0.9	1.1	0.5	1.0	0.5	0.2	0.8	1.0	1.5	0.8	0.4	0.5			1.5	0.2	0.8	0.4
90%	52	51	53	51	52	49	50	54	51	53	51	52	52	54			54	49	52	1.5
																		Median	52	

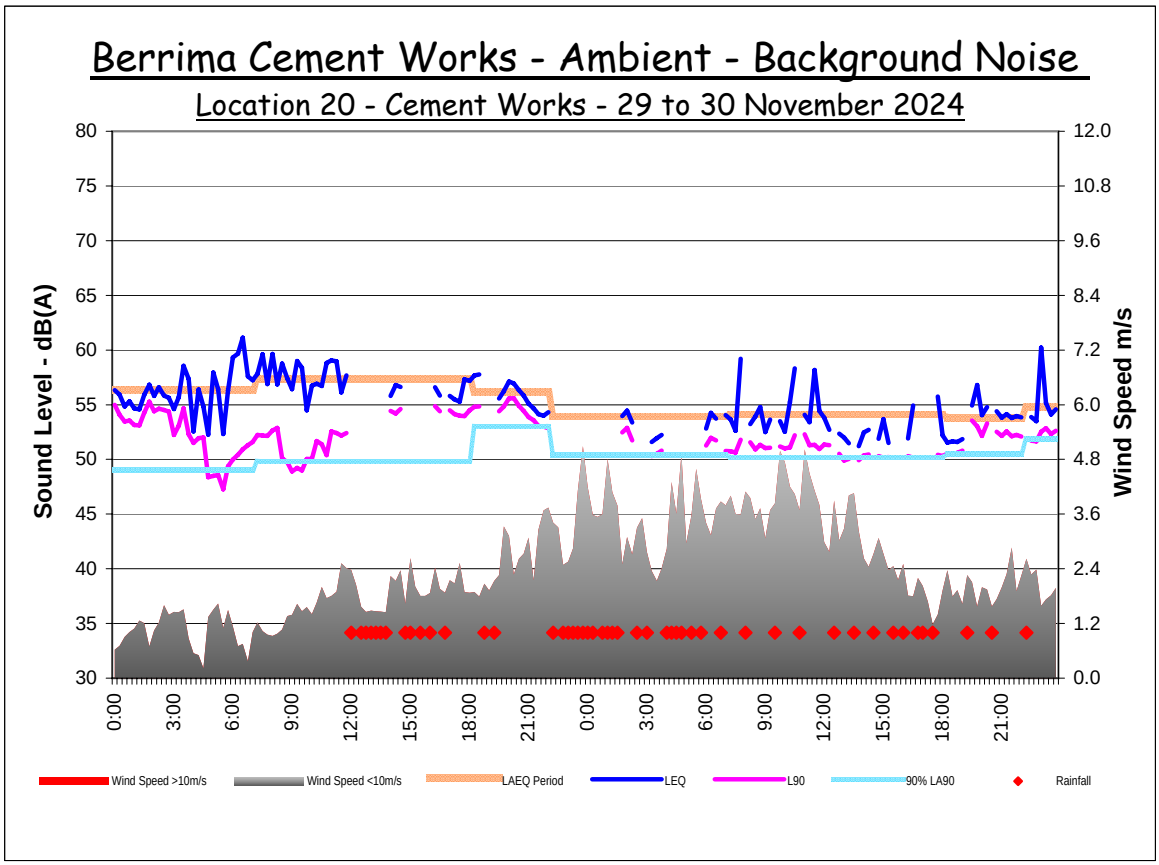
Night LA90

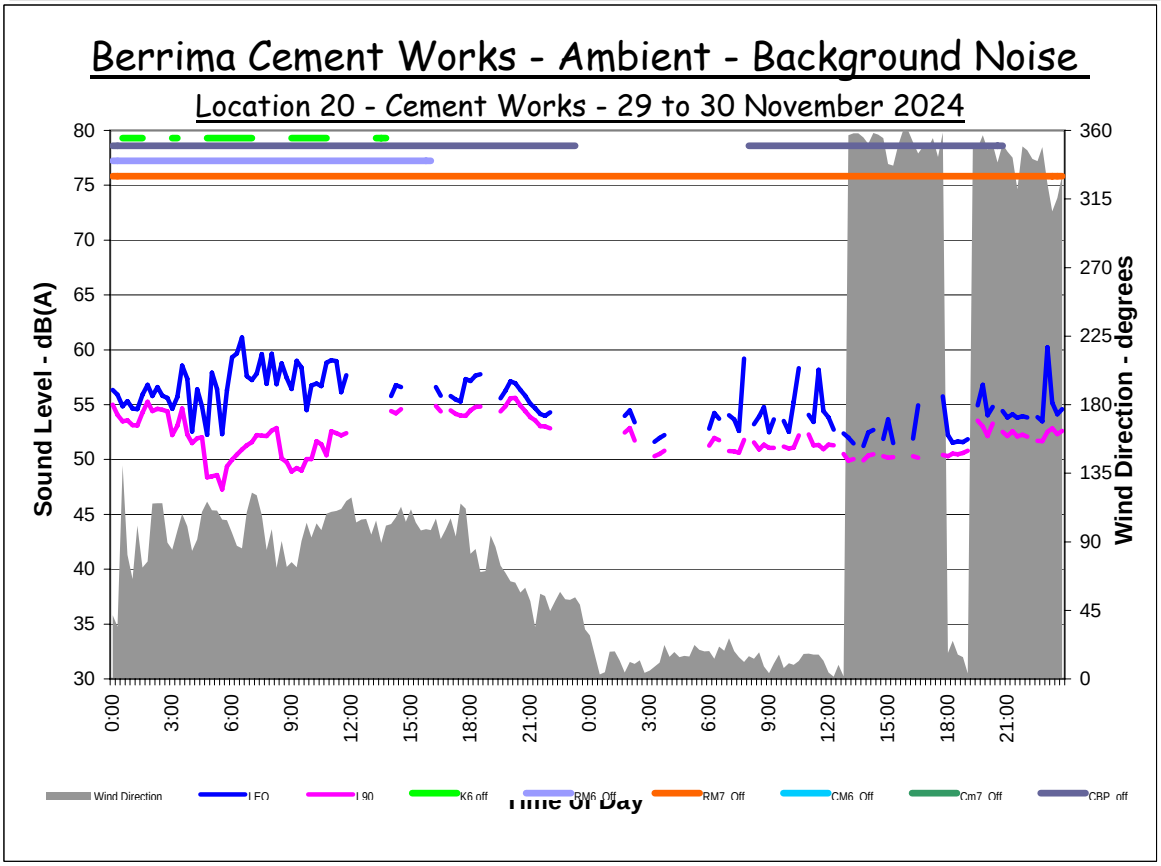
Time	27/11	28/11	29/11	30/11	1/12	2/12	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12	Maximum	Minimum	Average	SD
22:00	54	53	53	52	52	52	50	54	52	54	50	52	52	55			55	50	52	1.5
22:15	53	53			52	51	50	54	52	55	51	52	52	55			55	50	52	1.6
22:30	53	53	53	52	52	51	50	54	52	55	51	52	53	55			55	50	52	1.4
22:45		54		52	52	52	50	54	51	54	51	53	53	55			55	50	53	1.6
23:00	53	53		53	52	52	50	54	52	55	51	54	53	55			55	50	53	1.6
23:15	52	54		53	52	52	51	54	52	53	51	54	53				54	51	53	1.2
23:30	53	55		52	53	52	51	54	52	52	53	54	53				55	51	53	1.1
23:45	53	55		53	53	52	50	54	52	53	53	53	53				55	50	53	1.1
0:00	53	55		53	53	52	51	54	52	54	53	54	54	55			55	51	53	1.2
0:15	54	54		53	52	52	51	54	53	55	53	54	54	55			55	51	53	1.2
0:30	54	53	57	53	53	52	51	54	53	55	54	53	54	55			57	51	54	1.5
0:45	54	54		53	53	51	52	54	52	55	54	53	55	55			55	51	53	1.2
1:00	54	53		52	54	52	52	54	52	55	53	53	54	55			55	52	53	1.1
1:15	55	53		52	53	52	53	54	52	54	53	54	54	55			55	52	53	1.0
1:30	54	54		52	54	52	52	53	52	54	52	54	54	55			55	52	53	1.0
1:45	54	55	52	53	53	52	52	54	52	54	52	54	54	55			55	52	53	1.1
2:00	53	54	53	52	54	53	52	54	52	53	52	54	54	55			55	52	53	1.0
2:15	53	55	52	53	53	52	52	53	52	53	52	54	54	55			55	52	53	1.1
2:30	53	55		53	52	52	51	53	52	54	52	54	54	55			55	51	53	1.2
2:45	51	54	50	53	52	52	51	53	52	54	53	54	55	55			55	50	53	1.5
3:00	50	52		53	52	52	51	53	53		53	55	54	55			55	51	53	1.1
3:15	52	53	50	53	54	52	52	53	53	54	53	55	55	54			55	50	53	1.3
3:30	53	55	51	54	54	52	51	53	53	52	53	55	55	54			55	51	53	1.4
3:45	53	52	51	53	54	51	51	53	53	52	54	55	55	54			55	51	53	1.3
4:00	50	52		52	55	52	52	54	53	52	55	55	55	54			55	52	53	1.4
4:15	52	52		52	56	52	52	54	53	53	53	54	55	53			56	52	53	1.2
4:30	53	52		52	56	53	52	53	52	53	53	55	54	54			56	52	53	1.2
4:45	53	48		53	56	53	53	54	52	54	52	54	54	54			56	48	53	1.8
5:00	56	48	52	54	55	53	54	53	54	53	53	54	55	54			55	48	53	1.7
5:15	55	49		53	55	54	55	53	54	52	52	54	55	54			55	49	53	1.7
5:30	55	47	51	53	54	53	54	53	54	52	52	54	54	55			55	47	53	1.9
5:45	54	49		52	54	53	56	53	53	53	52	54	55	54			56	49	53	1.6
6:00	54	50	51	52	54	54	56	53	53	53	52	54	55	54			56	50	53	1.6
6:15	53	50	52	53	54	55	55	53	54	54	52	54	55	54			55	50	54	1.4
6:30	55	51	52	53	55	54	56	53	54	54	53	54	55	54			56	51	54	1.3
6:45	55	51		53	54	53	56	53	55	54	53	53	55	54			56	51	54	1.1
7:00	54	52	51	53	54	53	56	53	55	54	51	53	55	54			56	51	53	1.5
Max	56	55	57	54	56	55	56	54	55	55	55	55	55	55			57	54	55	0.7
Min	50	47	50	52	52	51	50	53	51	52	50	52	52	53			53	47	51	1.5
Ave	53	53	52	53	53	52	52	54	53	54	52	54	54	55			55	52	53	0.8
SD	1.3	2.1	1.6	0.5	1.2	0.9	1.9	0.5	0.9	0.9	1.0	0.7	0.9	0.5			2.1	0.5	1.0	0.5
90%	52	49	50	52	52	52	50	53	52	52	51	53	53	54			54	49	52	1.3
																		Median	52	

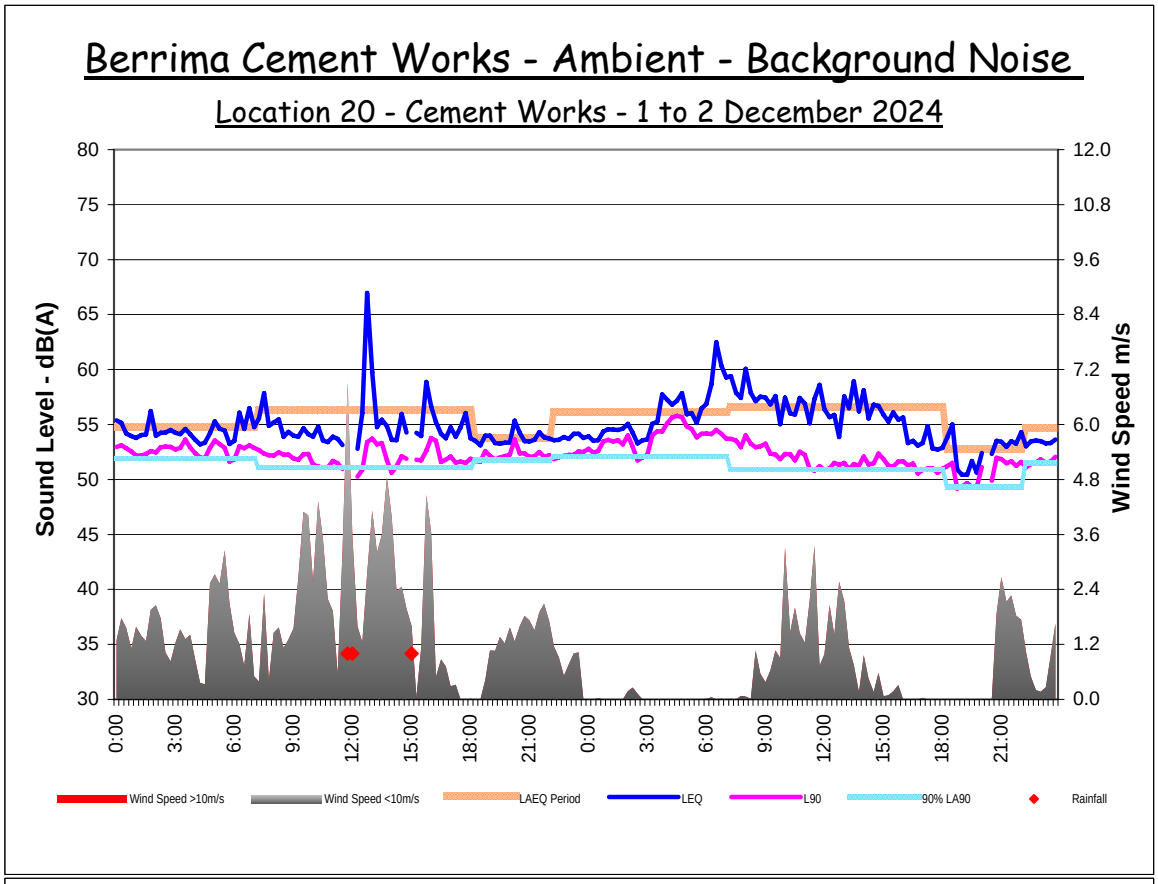
Two Day Results of Ambient Noise Monitoring

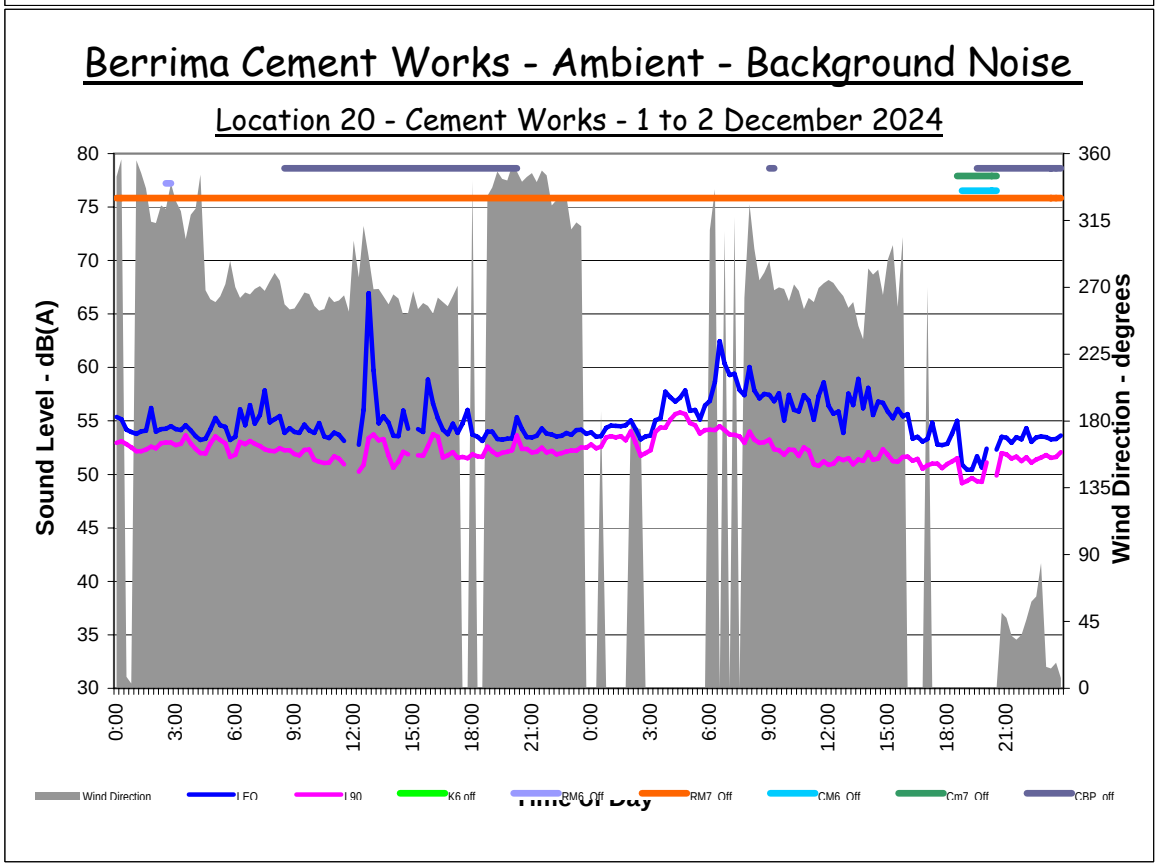


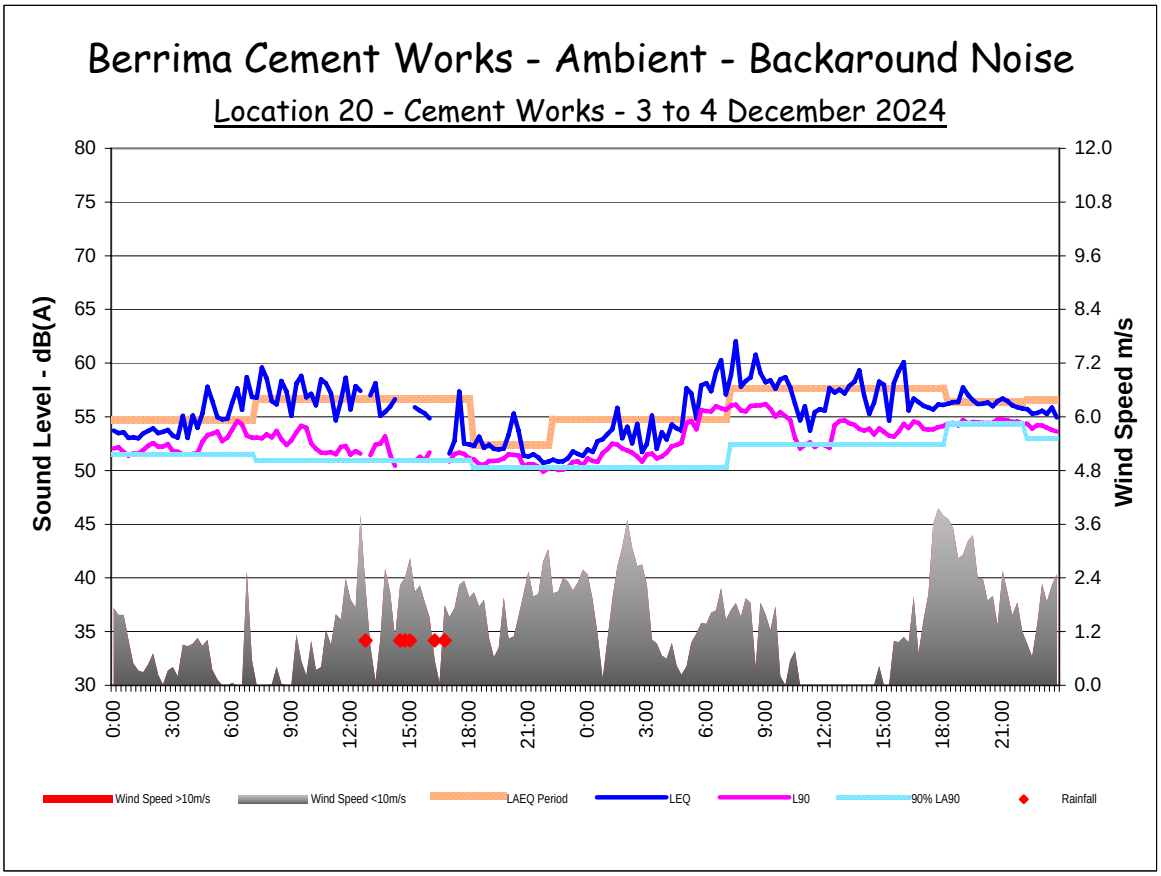


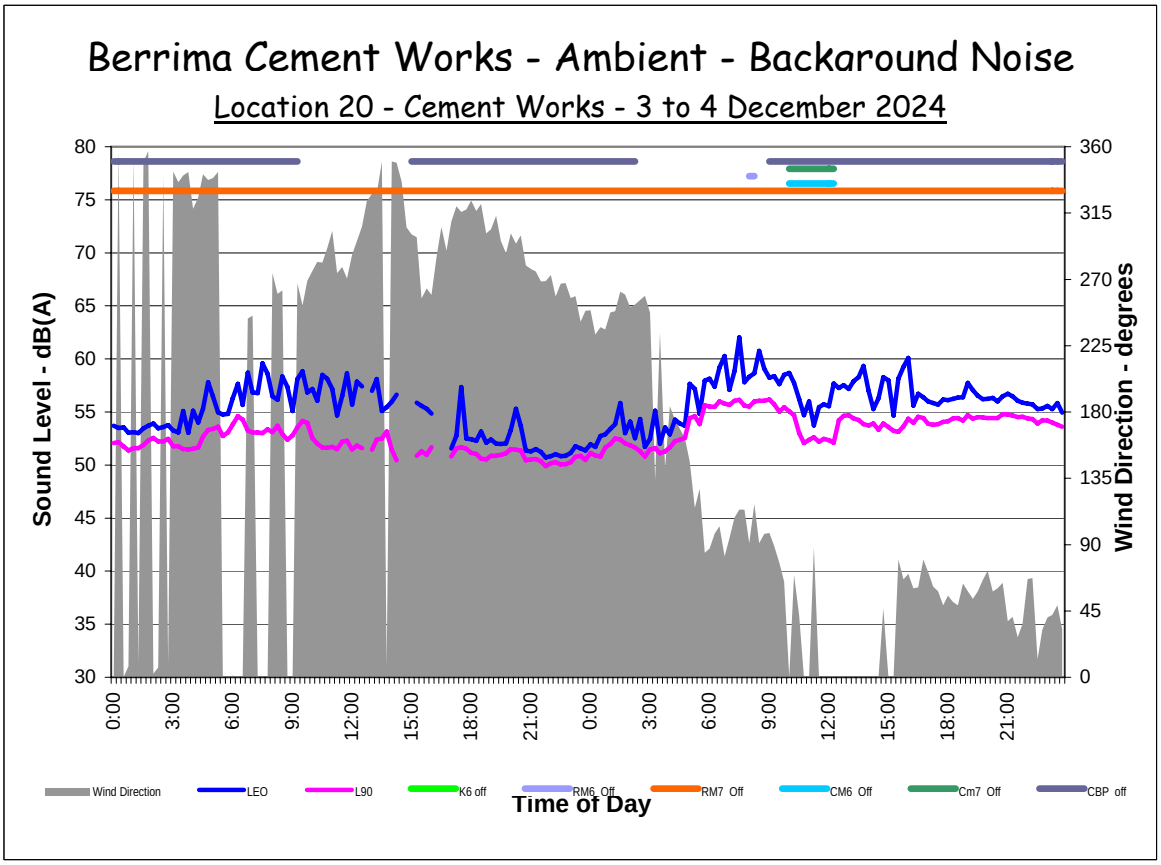

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 29 to 30 November 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

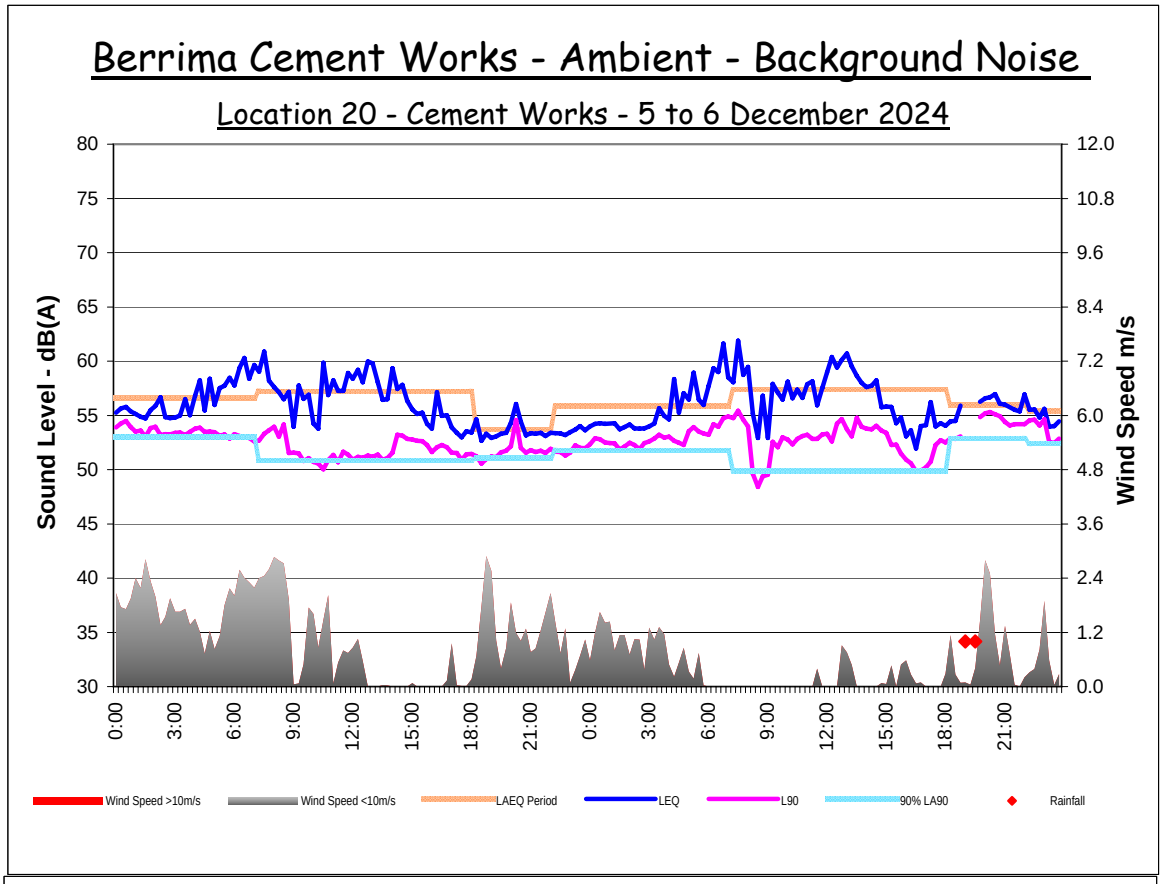

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 29 to 30 November 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Direction
LEQ
L90
K6 off
RM6 Off
RM7 Off
CM6 Off
Cm7 Off
CBP off
Time of Day

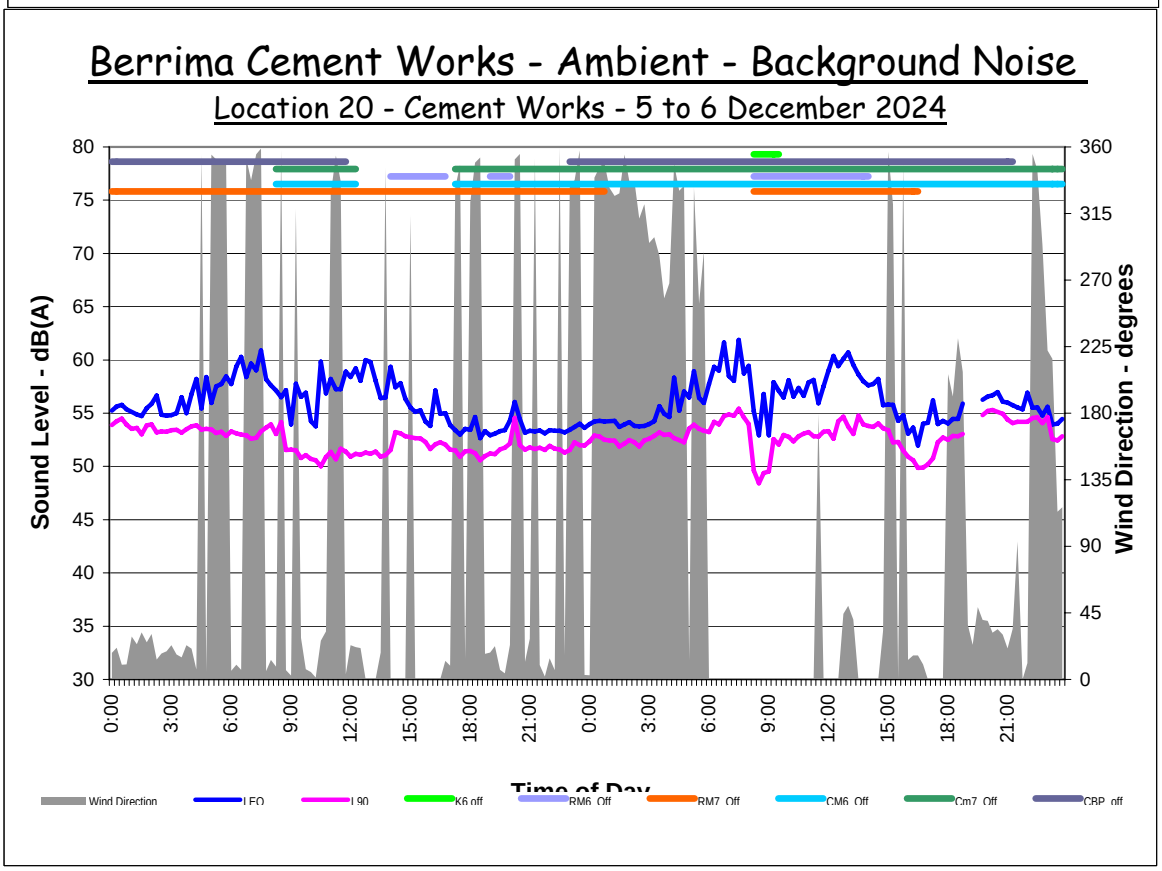

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 1 to 2 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

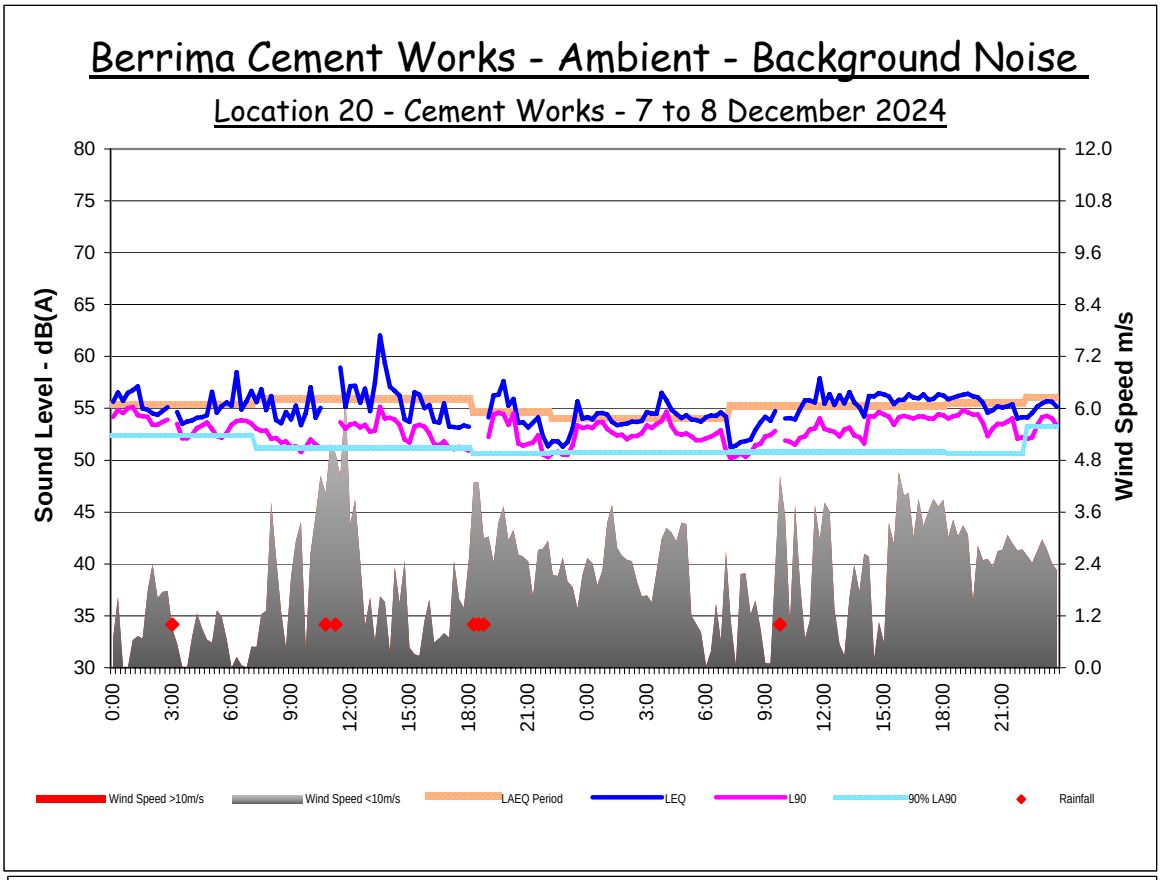

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 1 to 2 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Direction
LEQ
L90
K6 off
RM6 Off
RM7 Off
CM6 Off
Cm7 Off
CBP off
Time Of Day

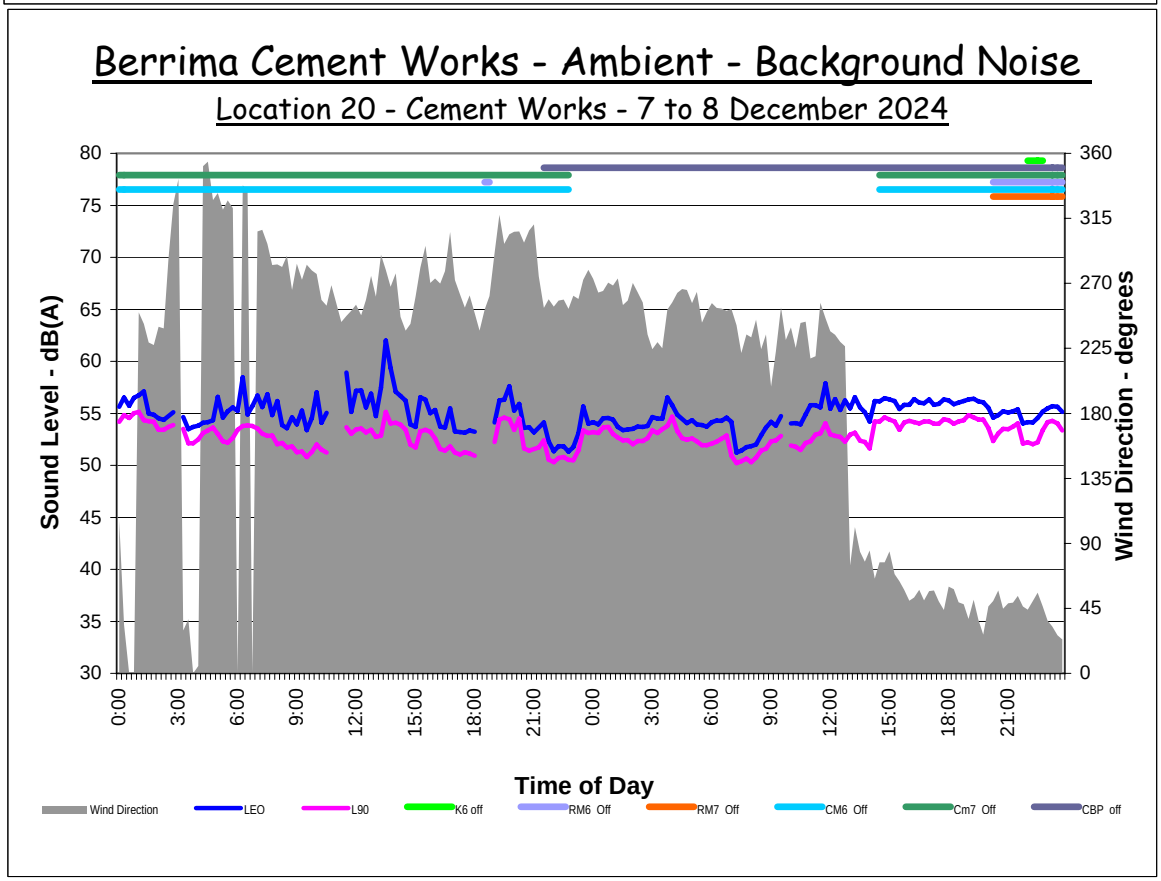

Berrima Cement Works - Ambient - Backaround Noise
Location 20 - Cement Works - 3 to 4 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

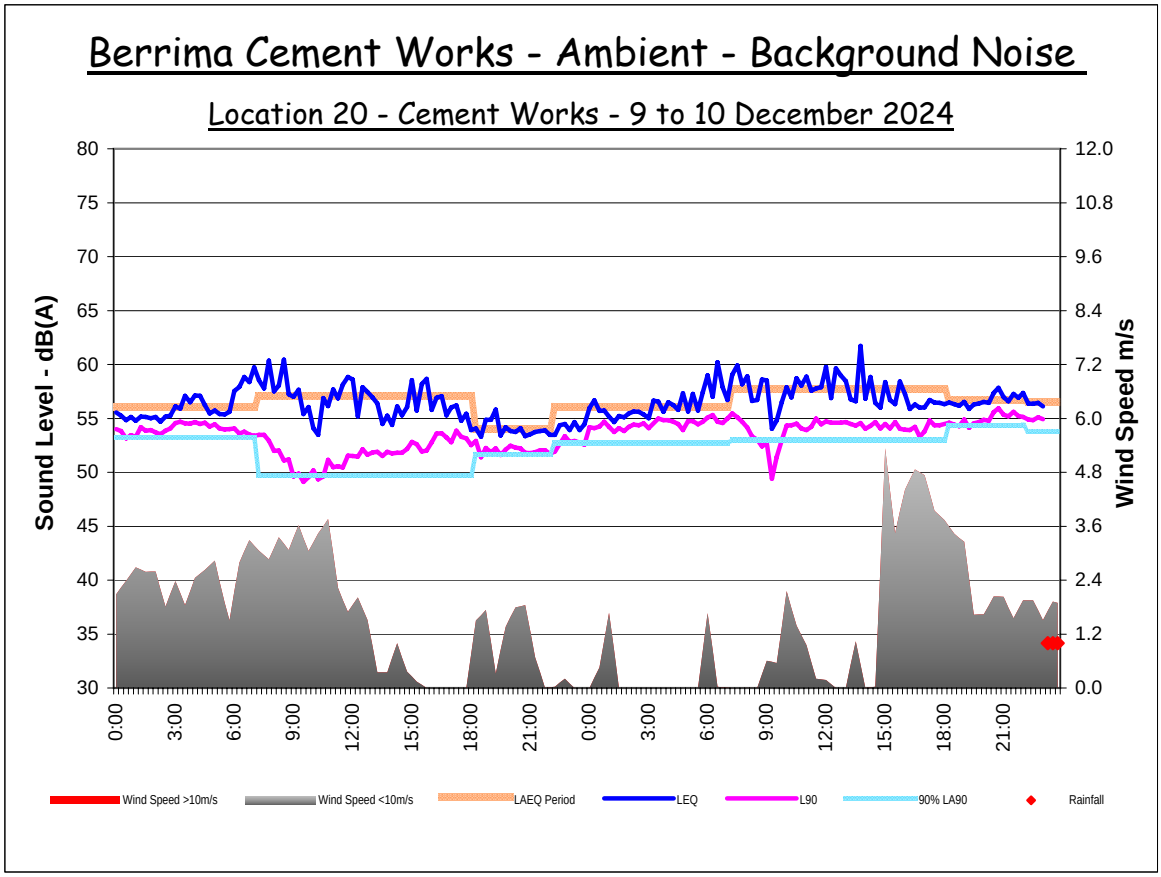

Berrima Cement Works - Ambient - Backaround Noise
Location 20 - Cement Works - 3 to 4 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Direction
LEQ
L90
K6 off
RM6 Off
RM7 Off
CM6 Off
Cm7 Off
CBP off
Time of Day

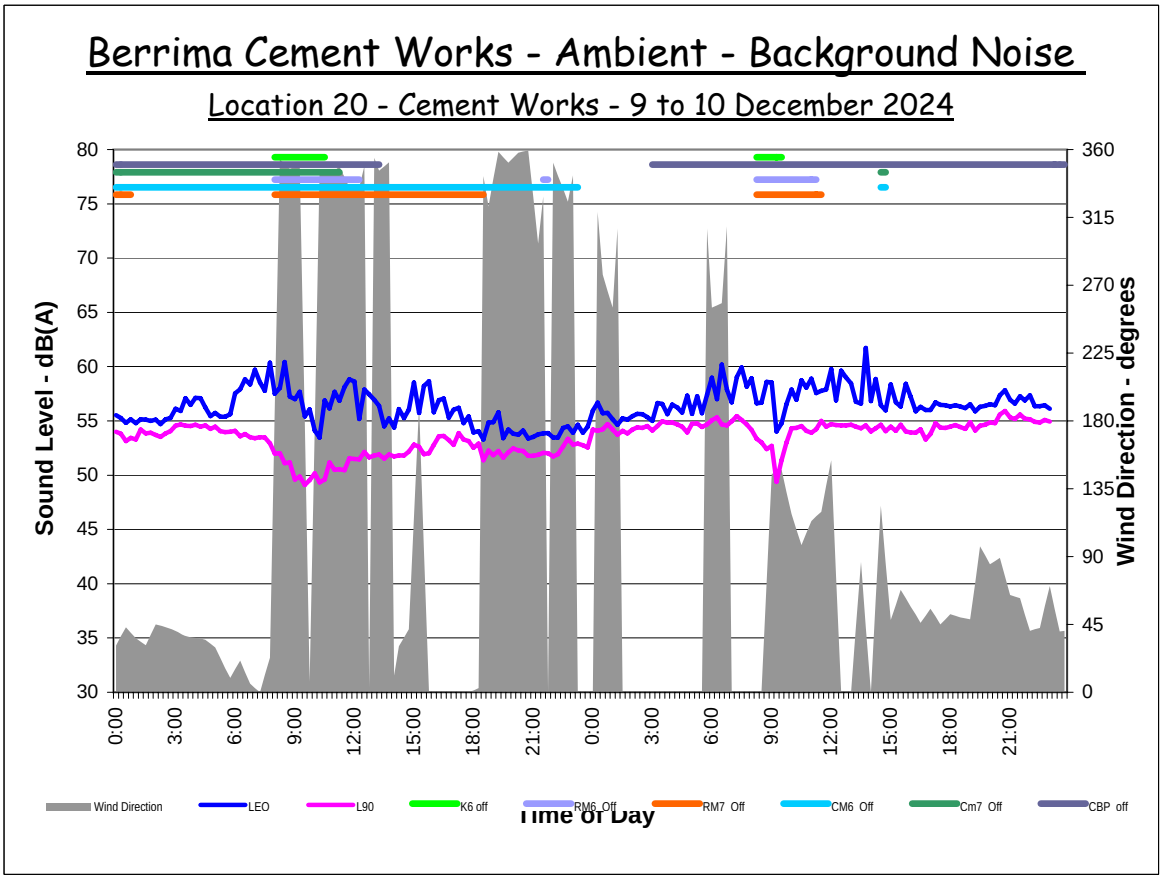

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 5 to 6 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

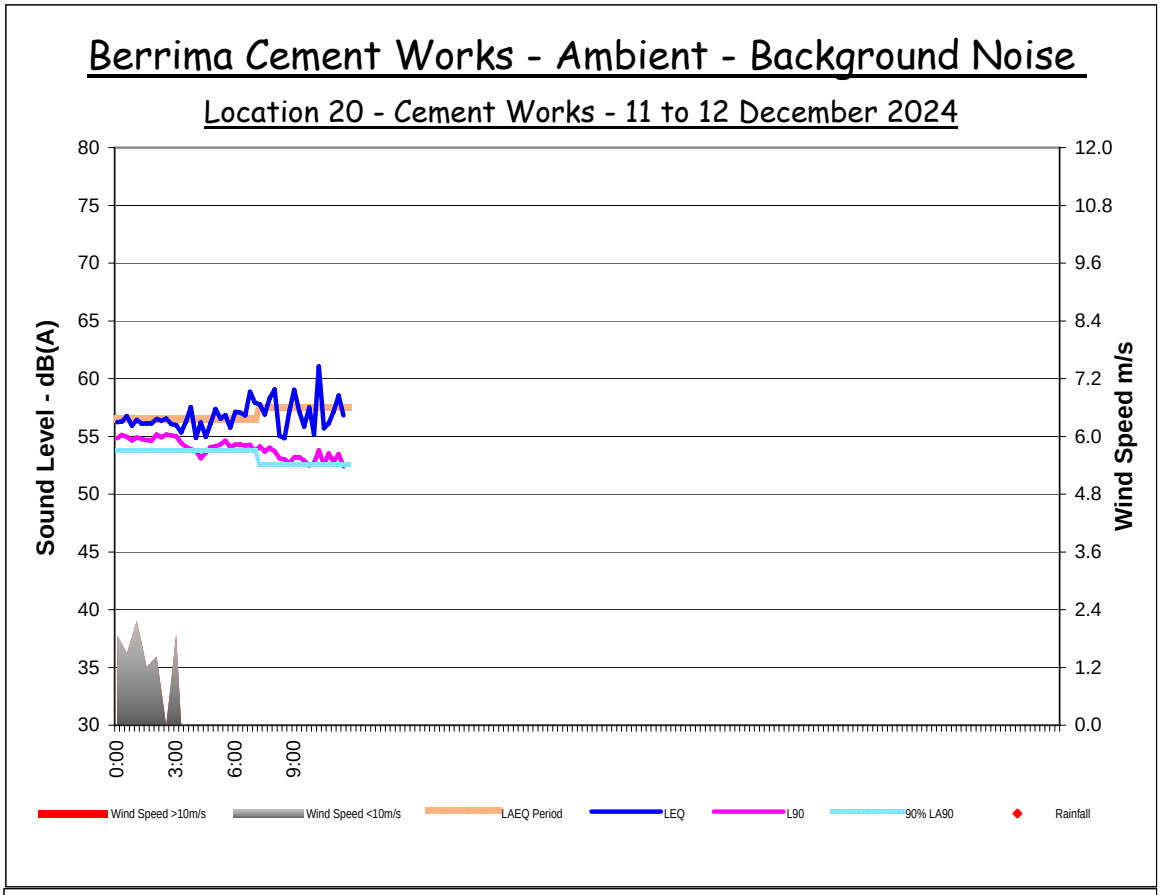

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 5 to 6 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Time of Day
Wind Direction
LEQ
L90
K6 off
RM6 Off
RM7 Off
CM6 Off
Cm7 Off
CBP off

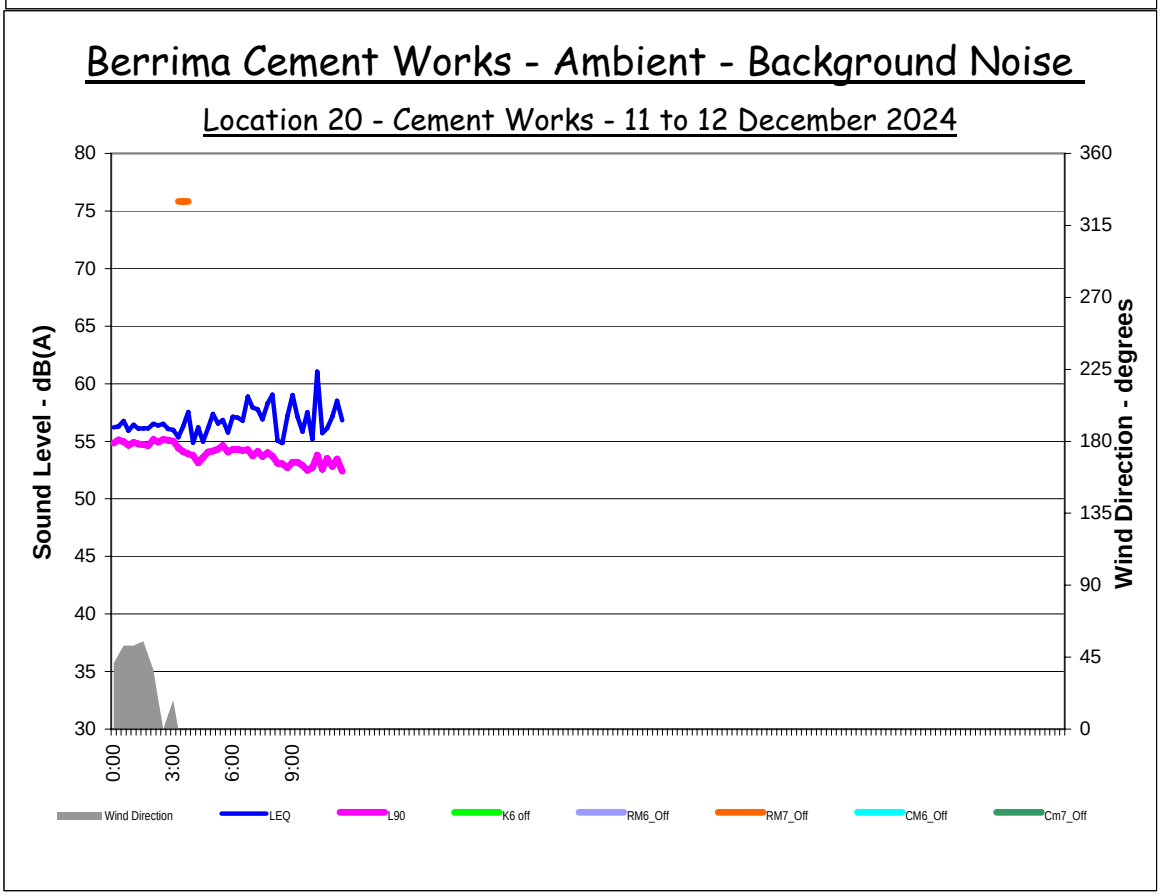

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 7 to 8 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

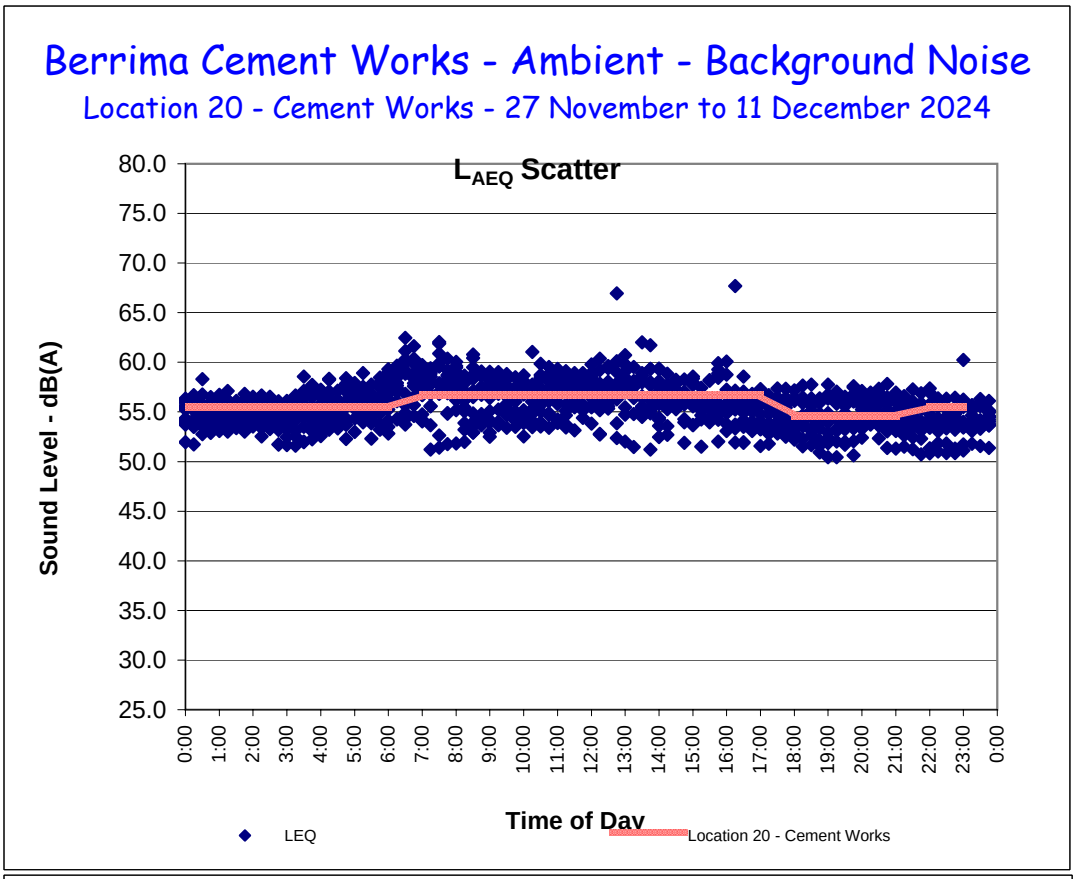

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 7 to 8 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Time of Day
Wind Direction
LEQ
L90
K6 off
RM6 Off
RM7 Off
CM6 Off
Cm7 Off
CBP off

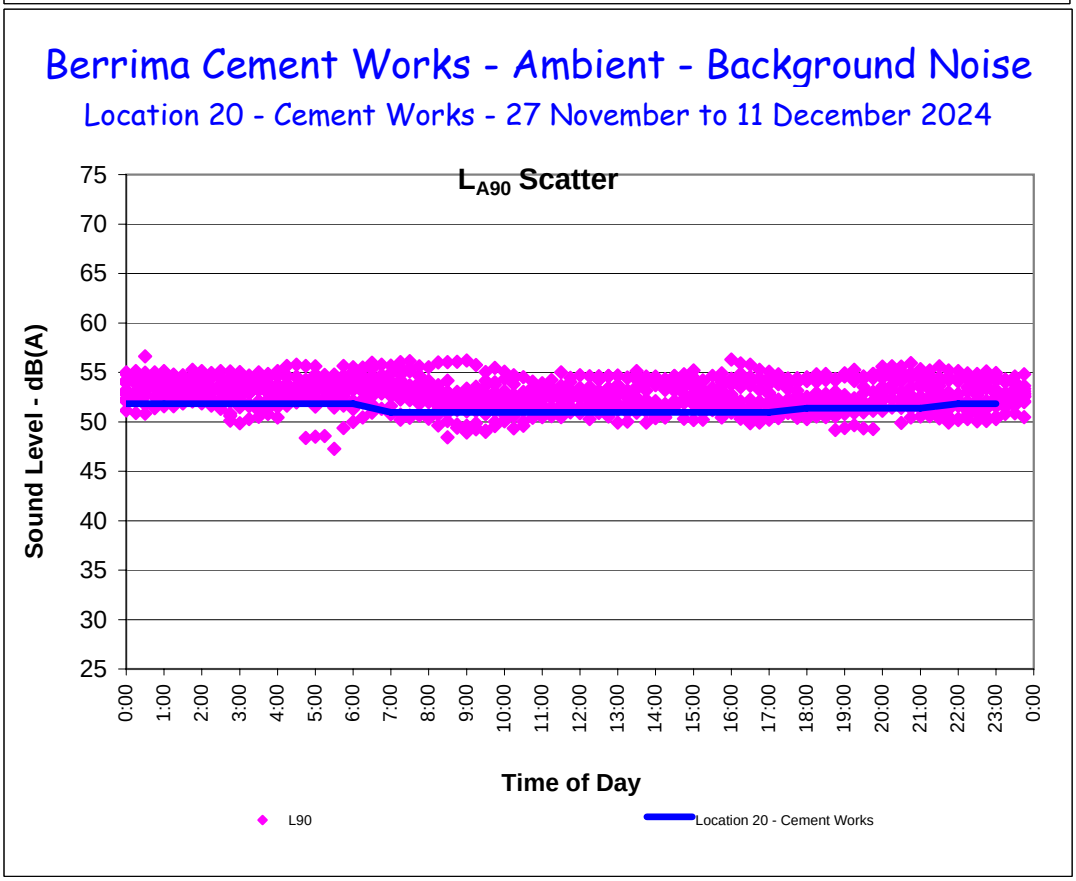

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 9 to 10 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

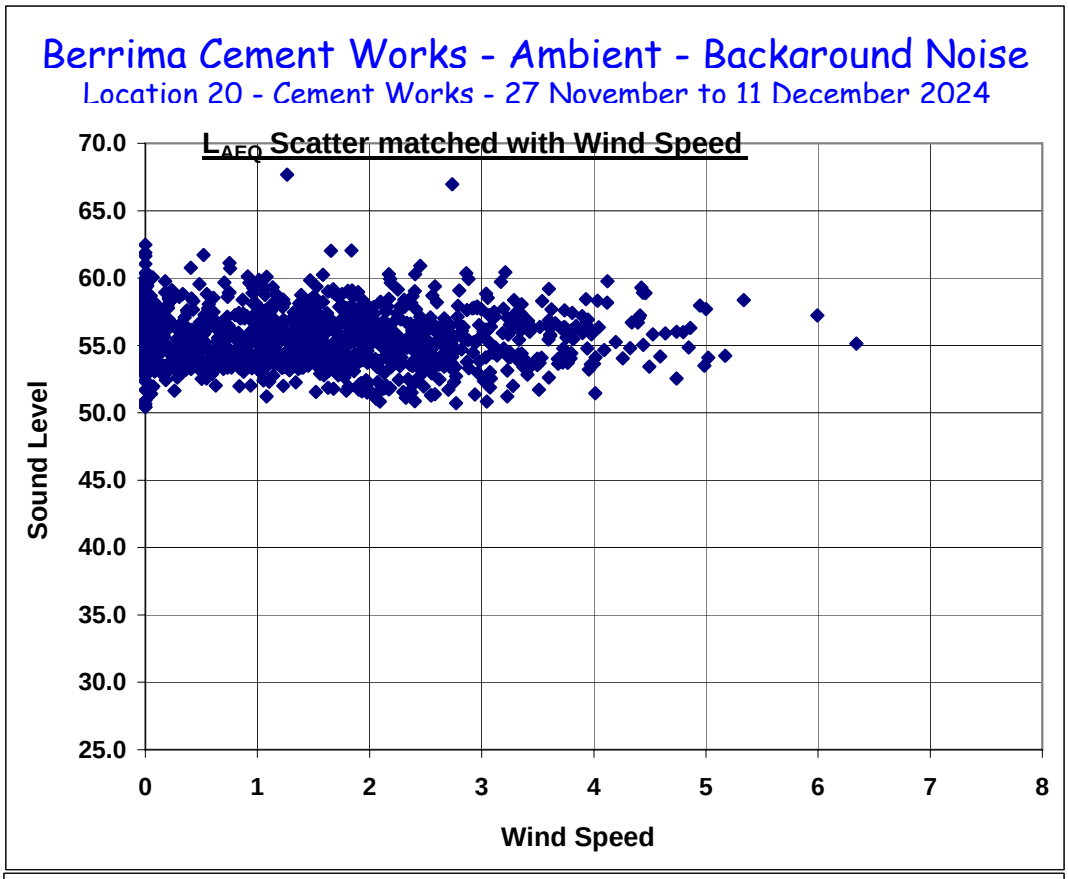

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 9 to 10 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wind Direction
LEQ
L90
K6 off
RM6 Off
RM7 Off
CM6 Off
Cm7 Off
CBP off
Time of Day

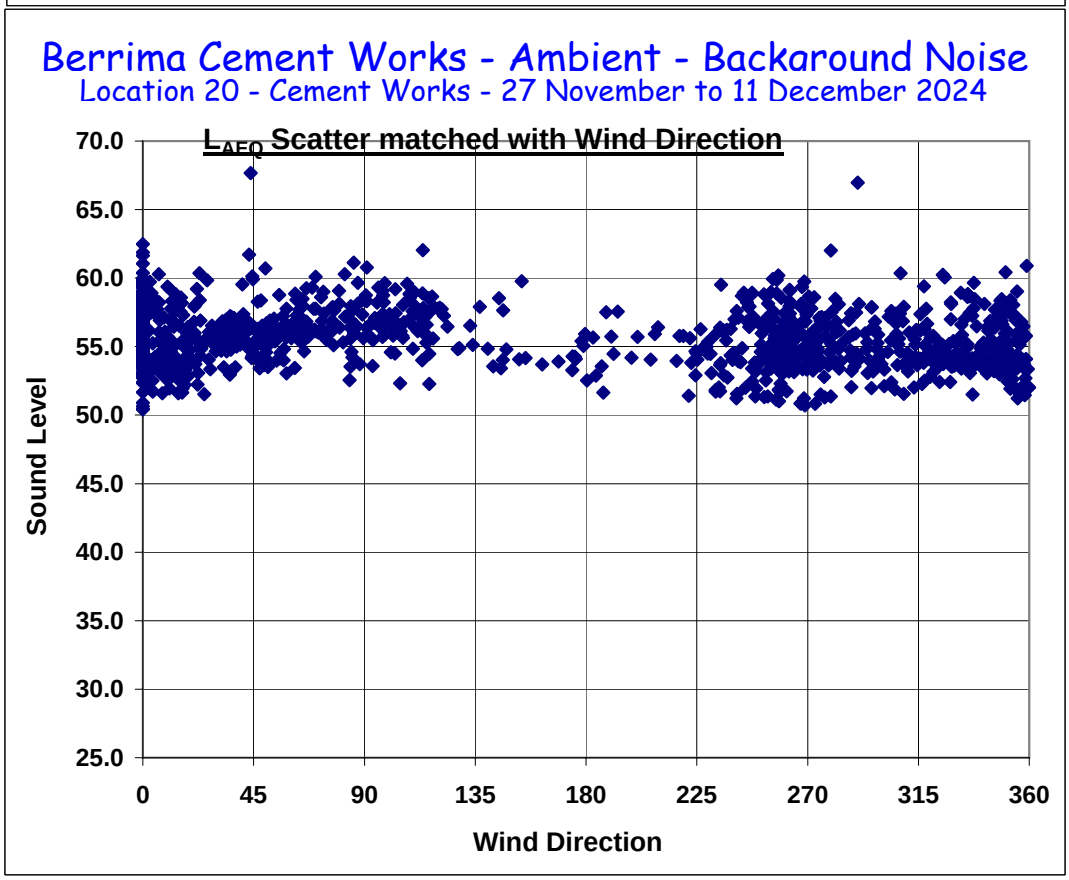

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 11 to 12 December 2024
Sound Level - dB(A)
Wind Speed m/s
80
75
70
65
60
55
50
45
40
35
30
12.0
10.8
9.6
8.4
7.2
6.0
4.8
3.6
2.4
1.2
0.0
0:00
3:00
6:00
9:00
Wind Speed >10m/s
Wind Speed <10m/s
LAEQ Period
LEQ
L90
90% LA90
Rainfall

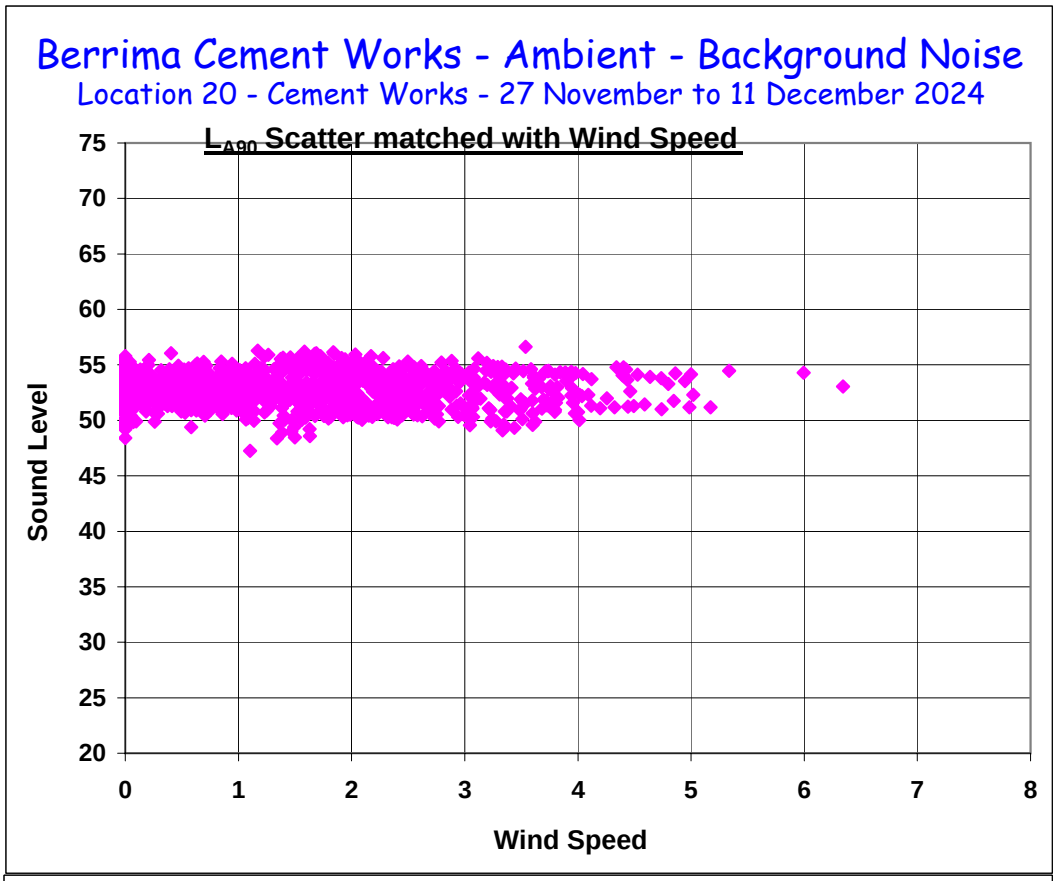

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 11 to 12 December 2024
Sound Level - dB(A)
Wind Direction - degrees
80
75
70
65
60
55
50
45
40
35
30
360
315
270
225
180
135
90
45
0
0:00
3:00
6:00
9:00
Wind Direction
LEQ
L90
K6 off
RM6_Off
RM7_Off
CM6_Off
Cm7_Off

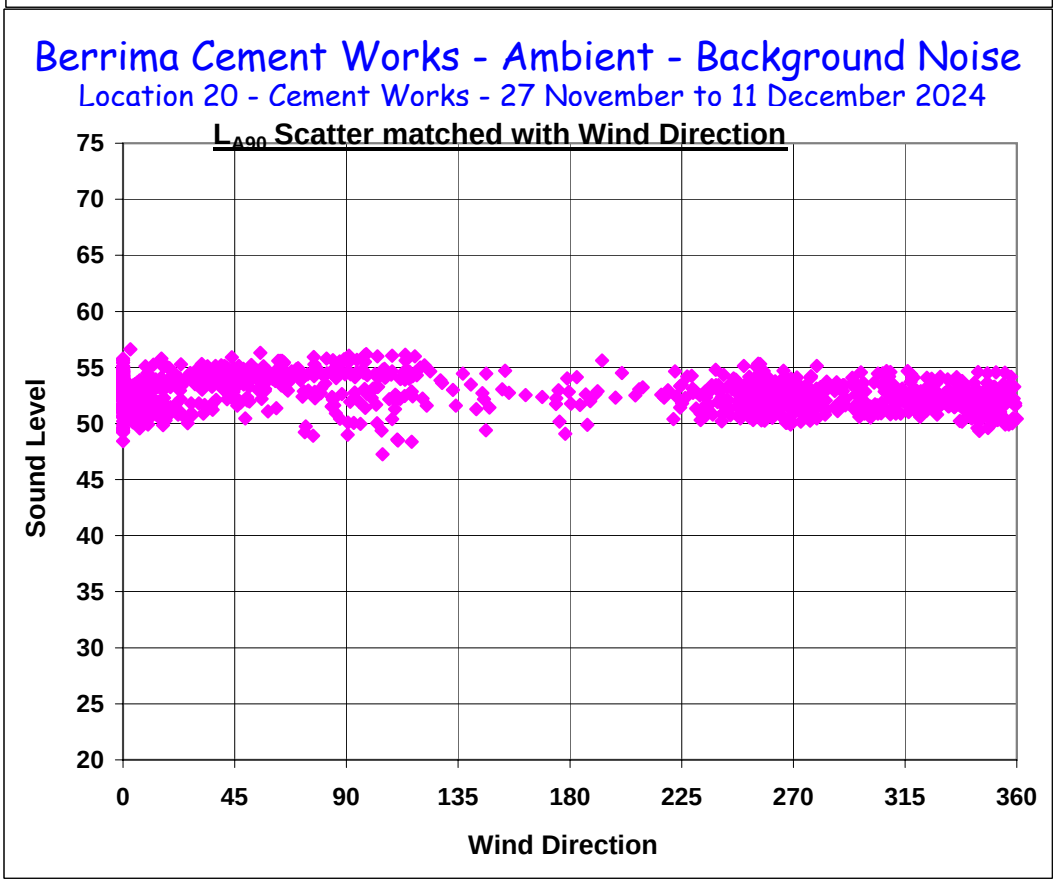

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 27 November to 11 December 2024
LAEQ Scatter
Sound Level - dB(A)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time of Day
LEQ
Location 20 - Cement Works


Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 27 November to 11 December 2024
LA90 Scatter
Sound Level - dB(A)
75
70
65
60
55
50
45
40
35
30
25
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time of Day
L90
Location 20 - Cement Works

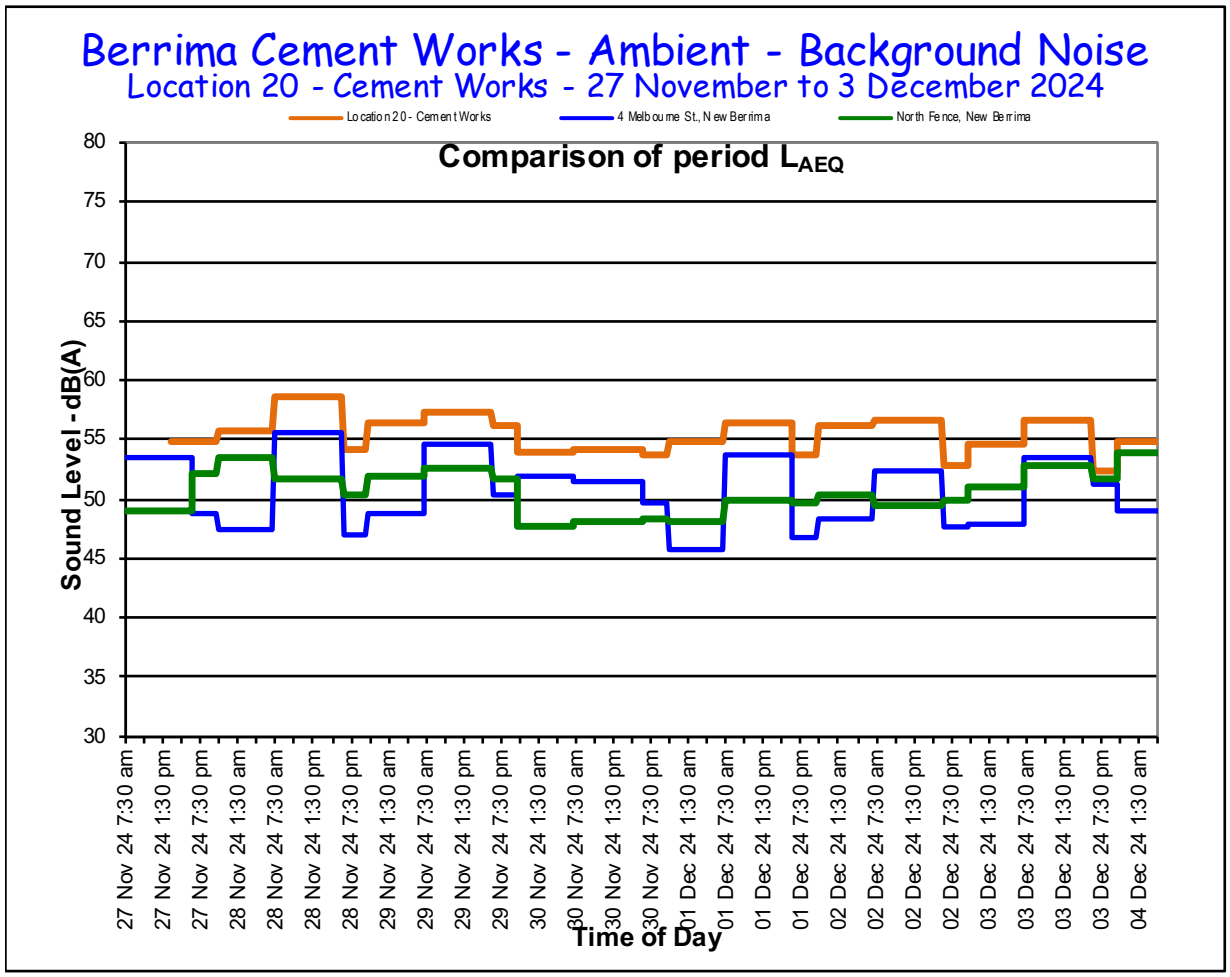

Berrima Cement Works - Ambient - Backaround Noise
Location 20 - Cement Works - 27 November to 11 December 2024
LAEQ Scatter matched with Wind Speed
Sound Level
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0
1
2
3
4
5
6
7
8
Wind Speed

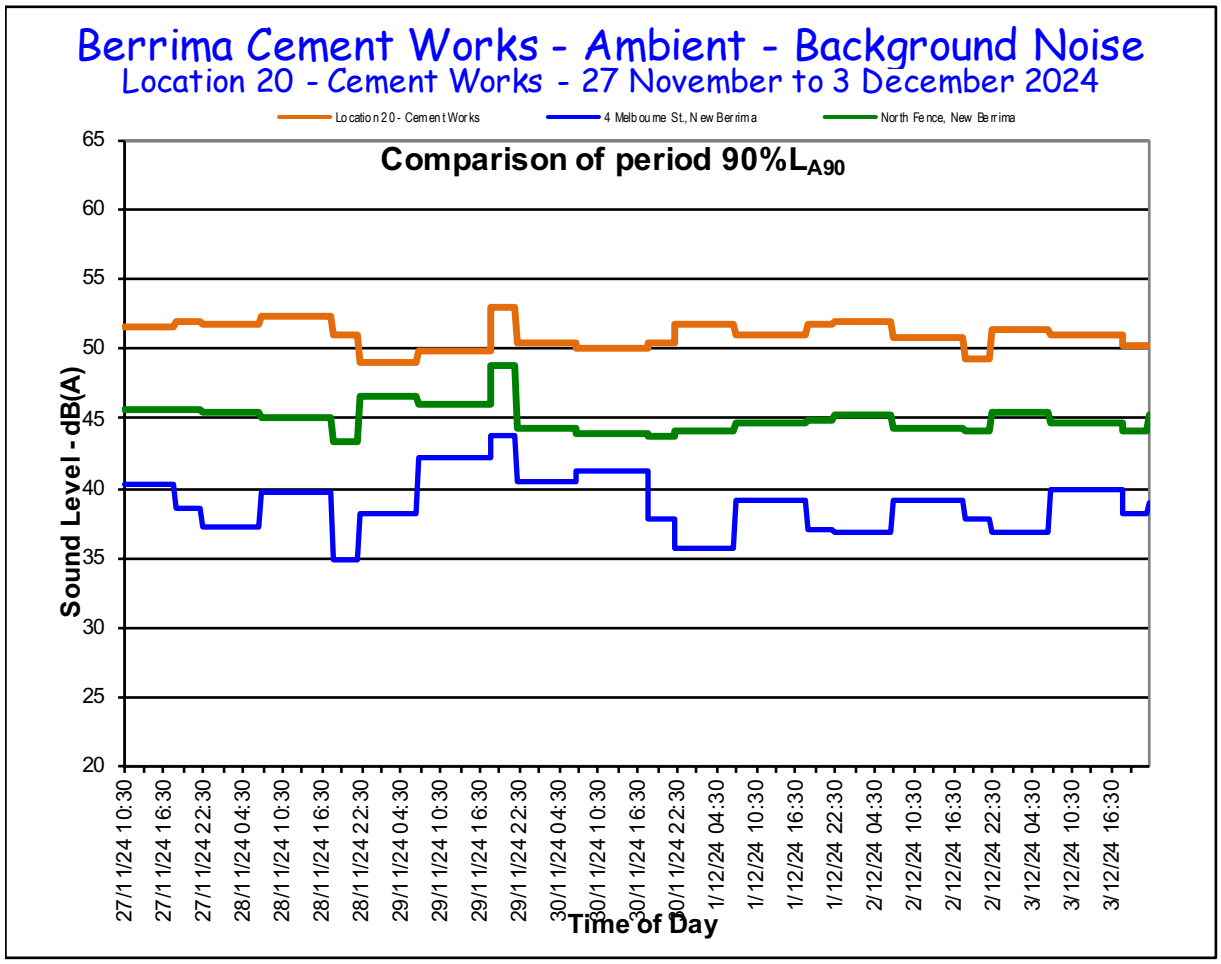

Berrima Cement Works - Ambient - Backaround Noise
Location 20 - Cement Works - 27 November to 11 December 2024
LAEQ Scatter matched with Wind Direction
Sound Level
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
0
45
90
135
180
225
270
315
360
Wind Direction


Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 27 November to 11 December 2024
L_{A90} Scatter matched with Wind Speed
Sound Level
75
70
65
60
55
50
45
40
35
30
25
20
0
1
2
3
4
5
6
7
8
Wind Speed

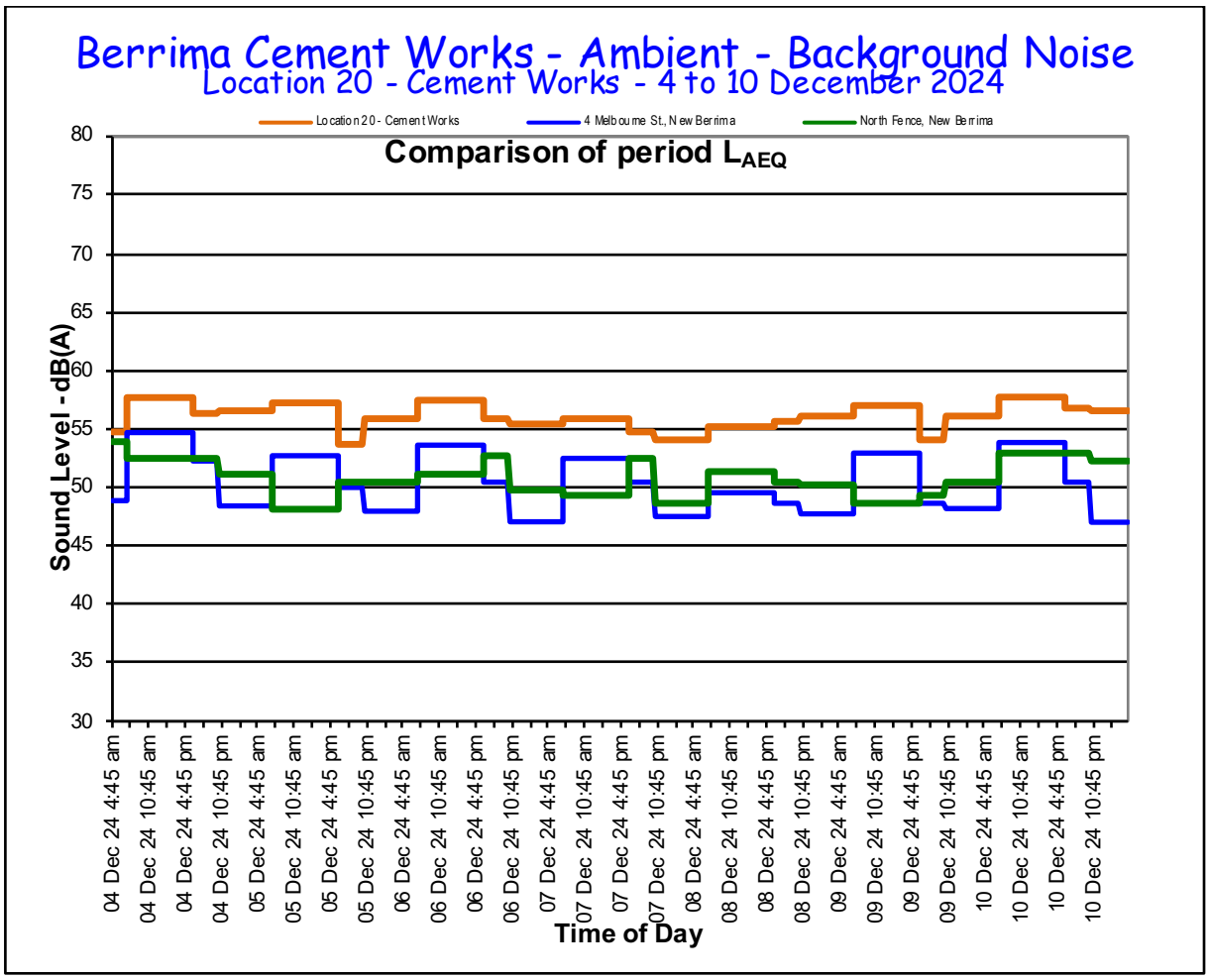

Berrima Cement Works - Ambient - Background Noise
Location 20 - Cement Works - 27 November to 11 December 2024
L_{A90} Scatter matched with Wind Direction
Sound Level
75
70
65
60
55
50
45
40
35
30
25
20
0
45
90
135
180
225
270
315
360
Wind Direction

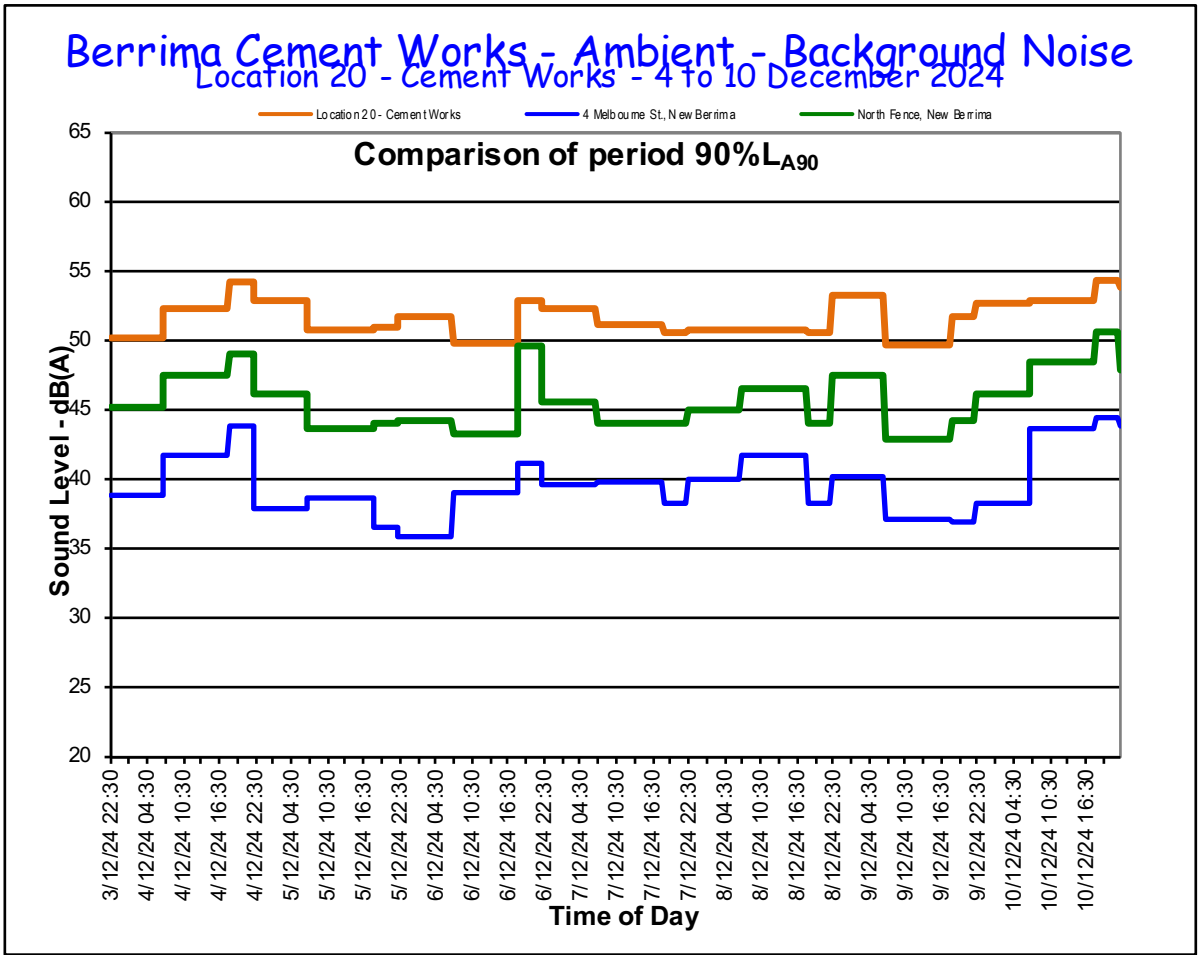
Location LAEQ compared with Background Site LAEQ





Location LAEQ compared with Background Site LAEQ





ABN: 25 153 946 064
ACN: 153 946 064

Appendix E: Narrow-band spectra from attended measurement recordings

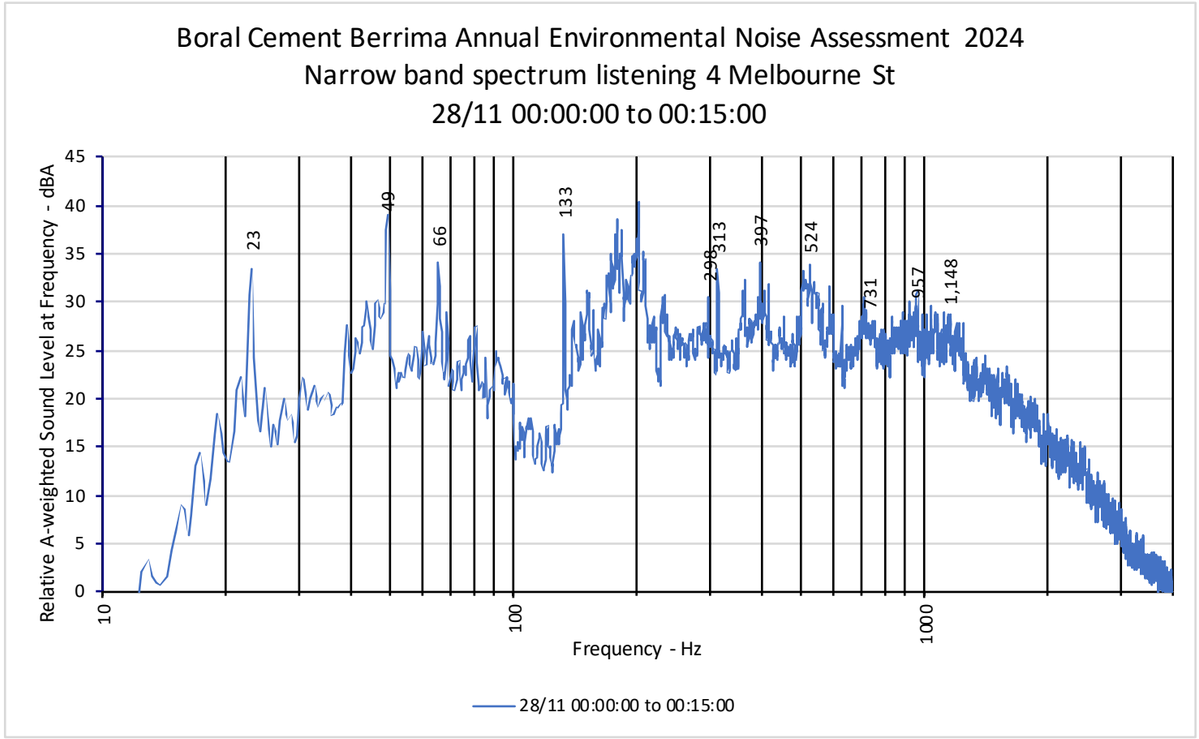


Figure E1: A1

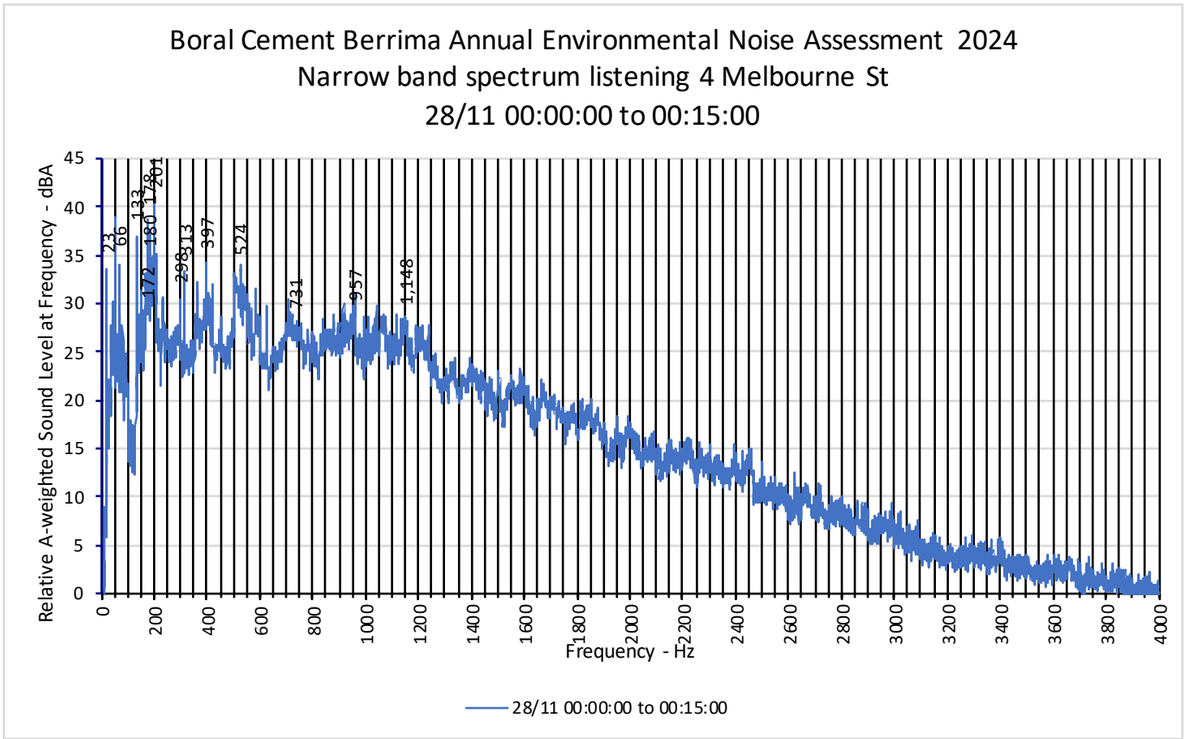


Figure E1: B1

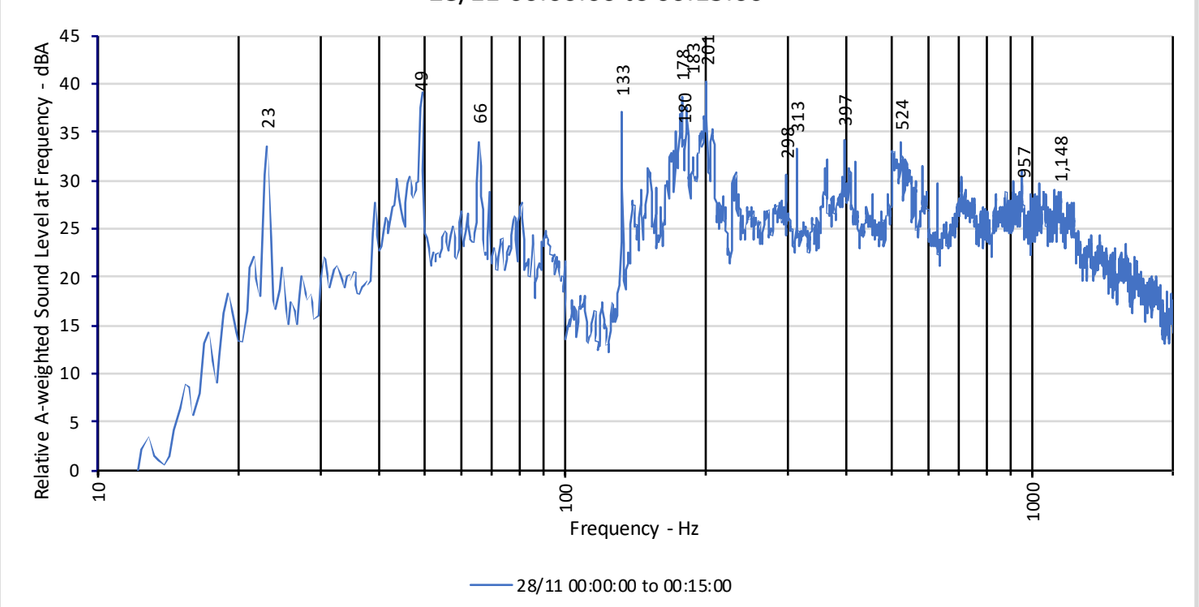


Figure E1: A2

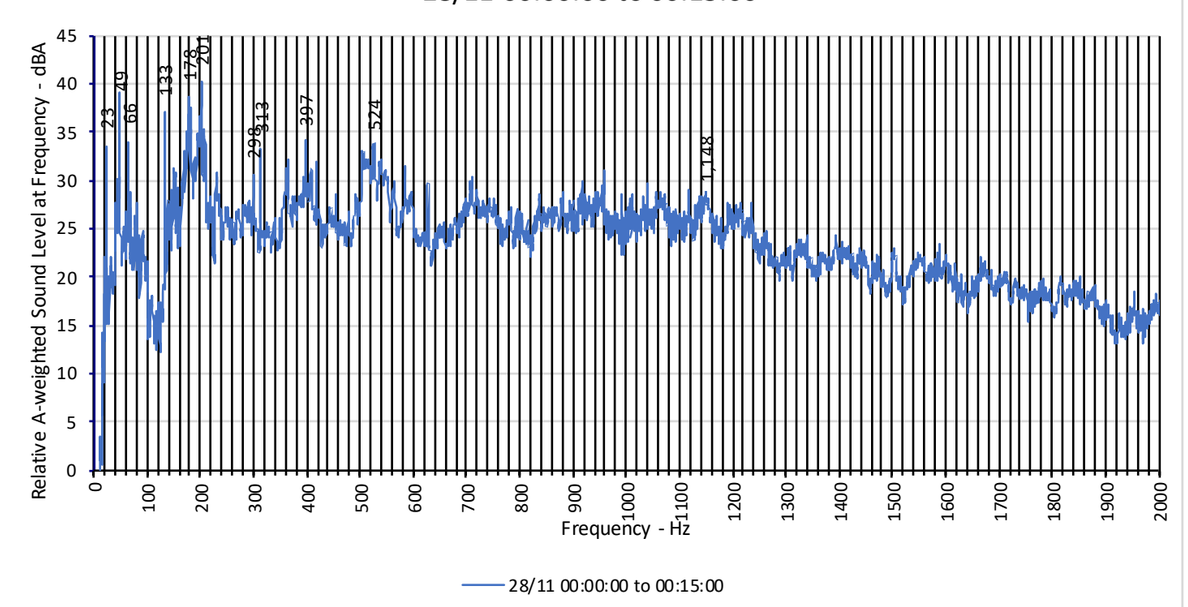


Figure E1: B2

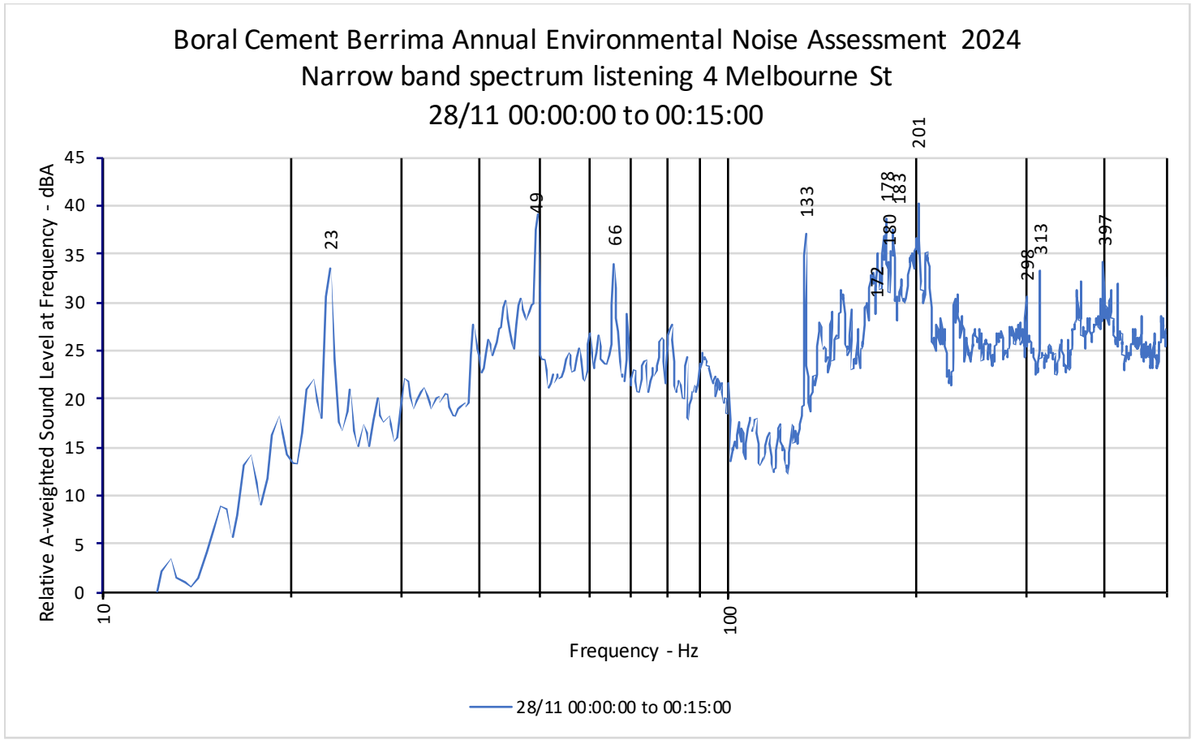


Figure E1: A3

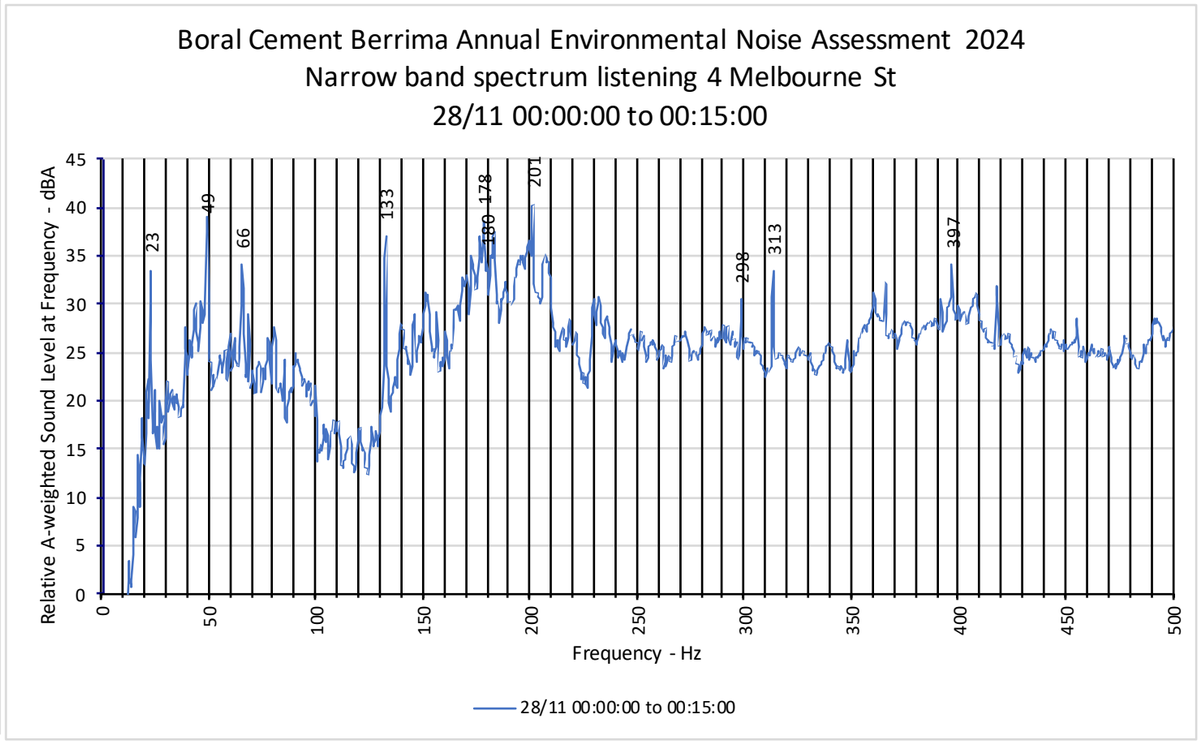


Figure E1: B3

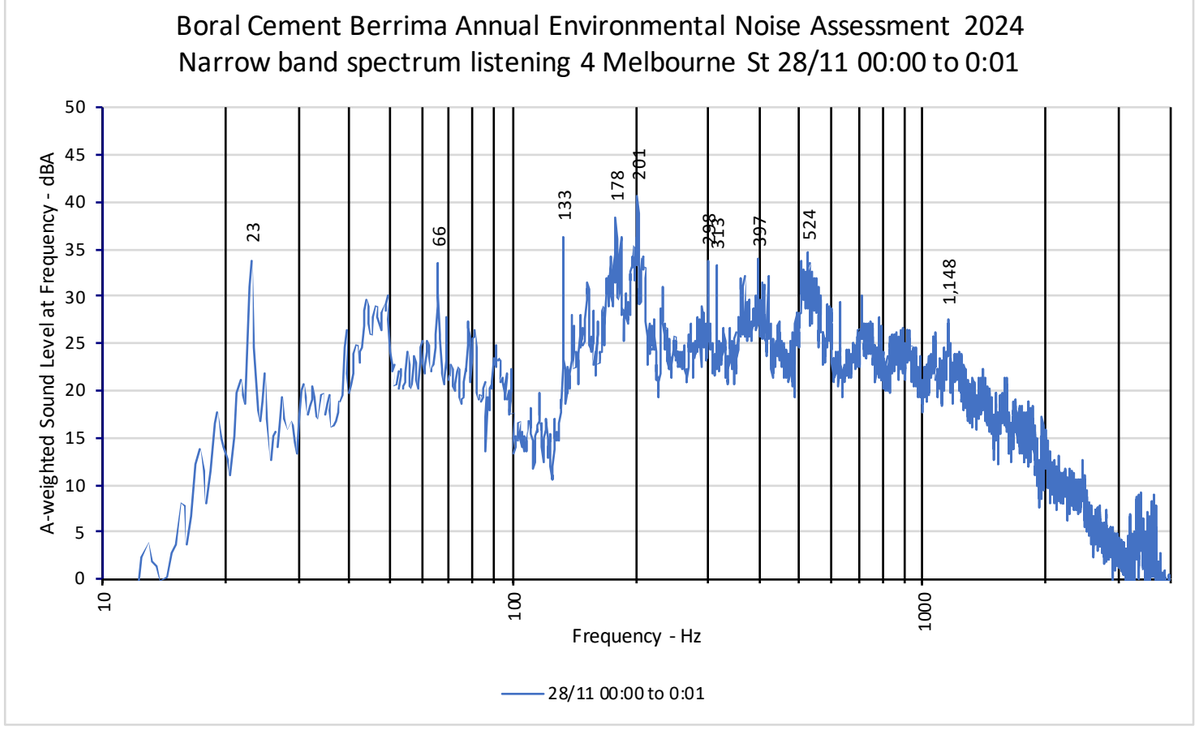


Figure E2: A1

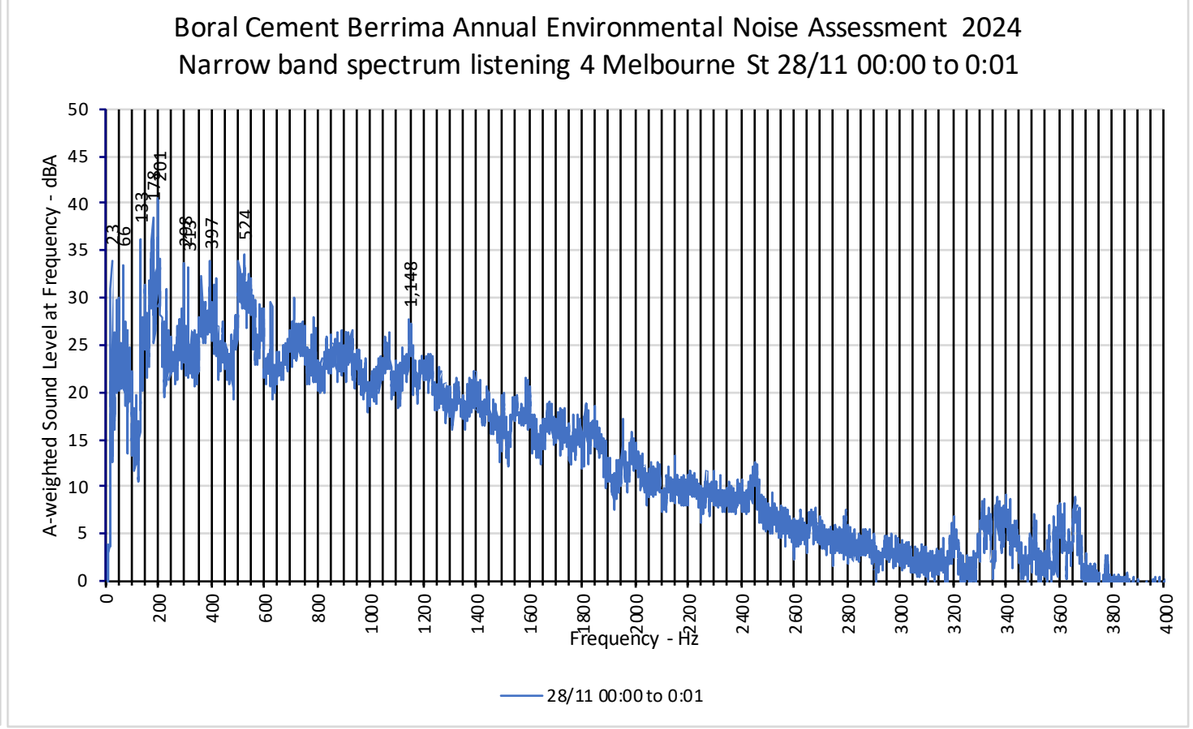


Figure E2: B1

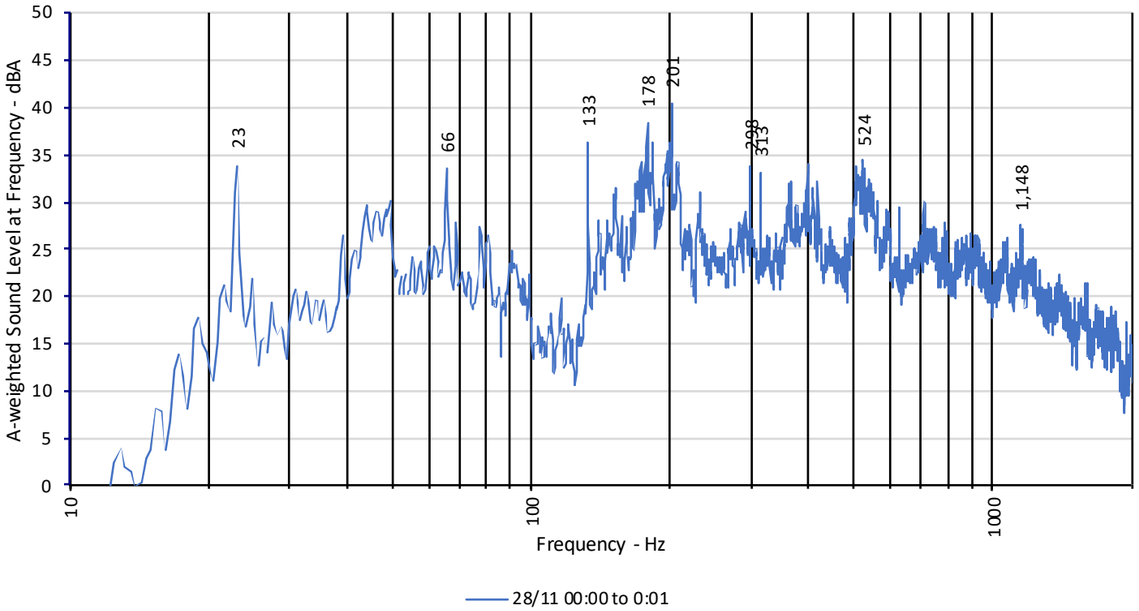
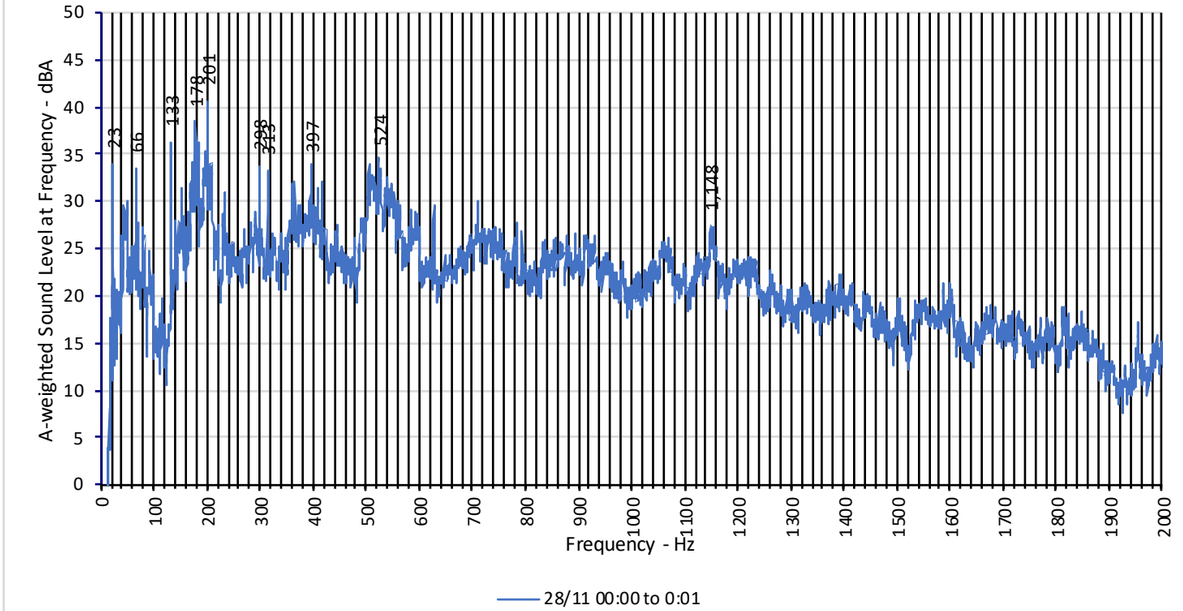


Figure E2: A2



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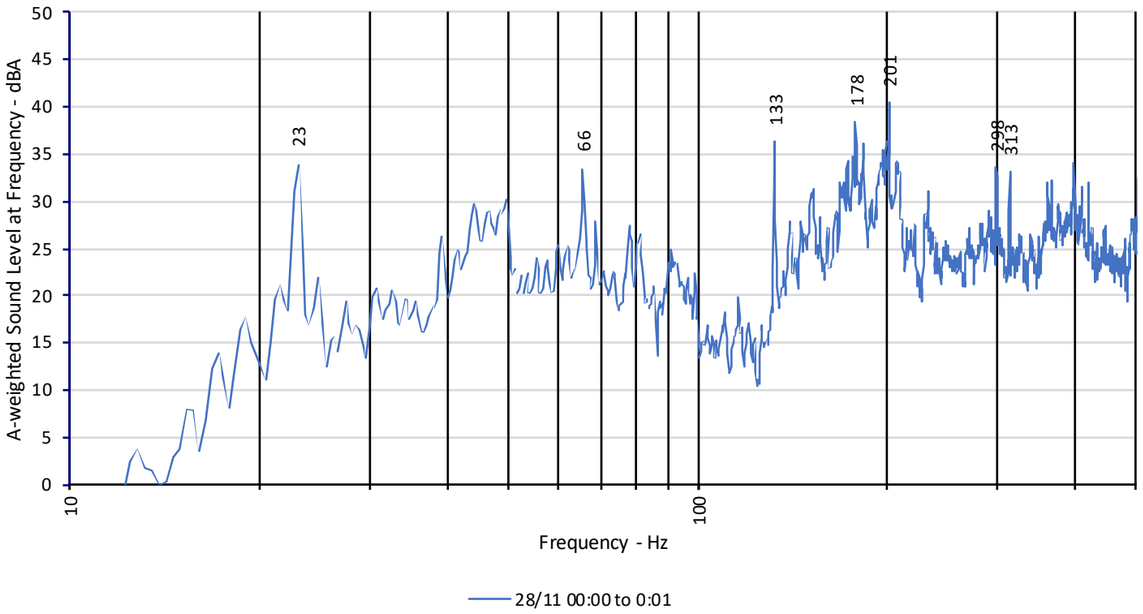


Figure E2: A3

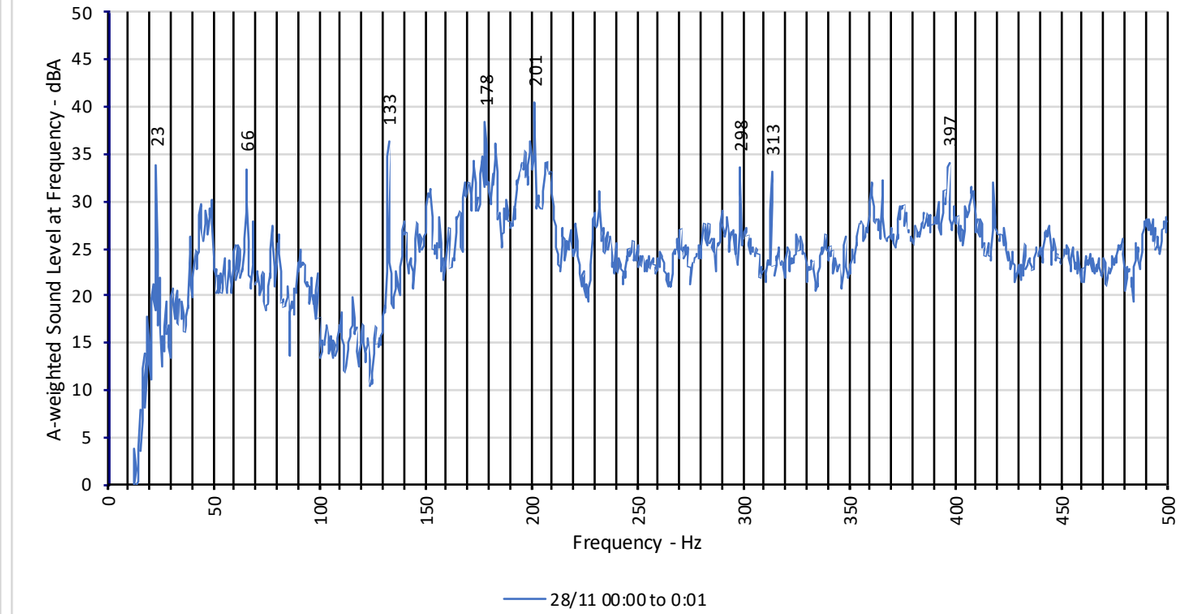


Figure E2: B3

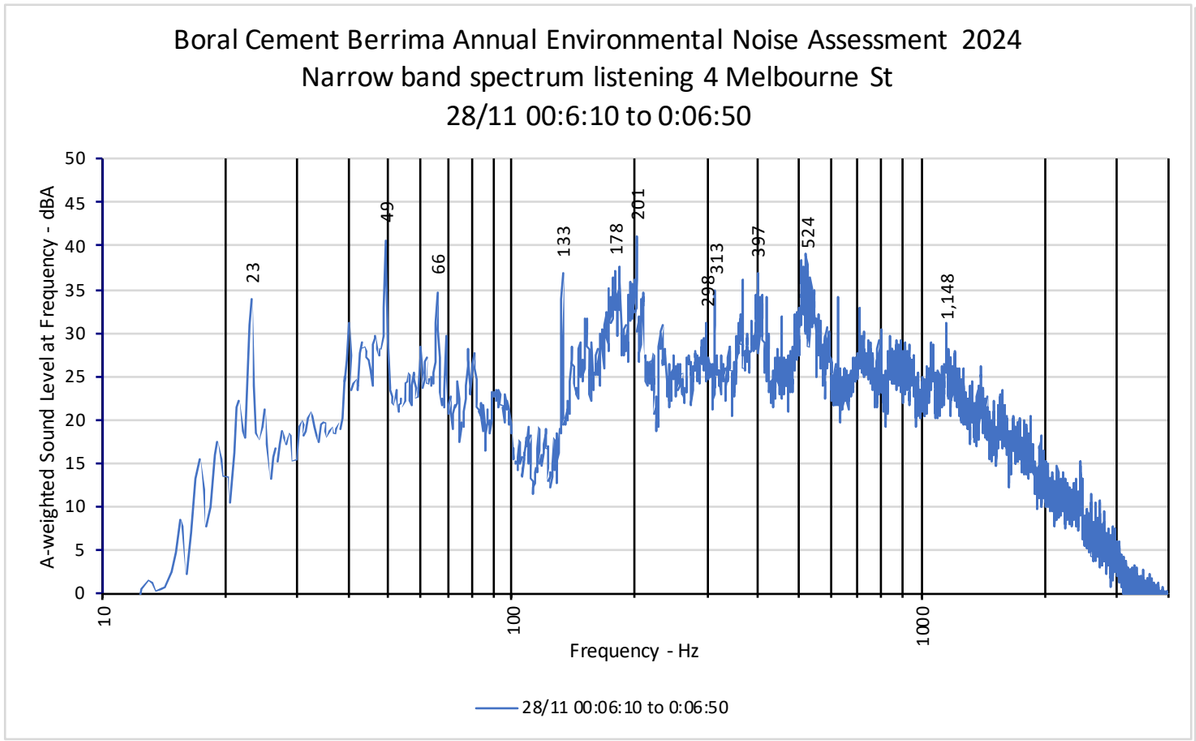


Figure E3: A1

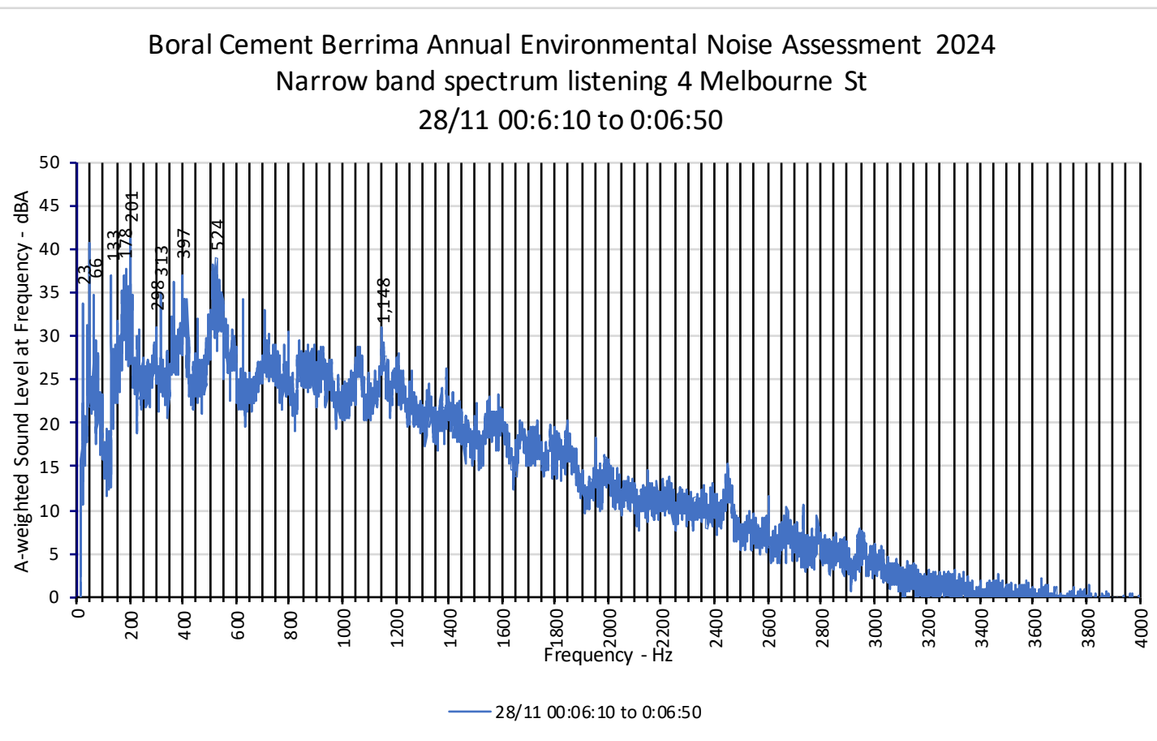


Figure E3: B1

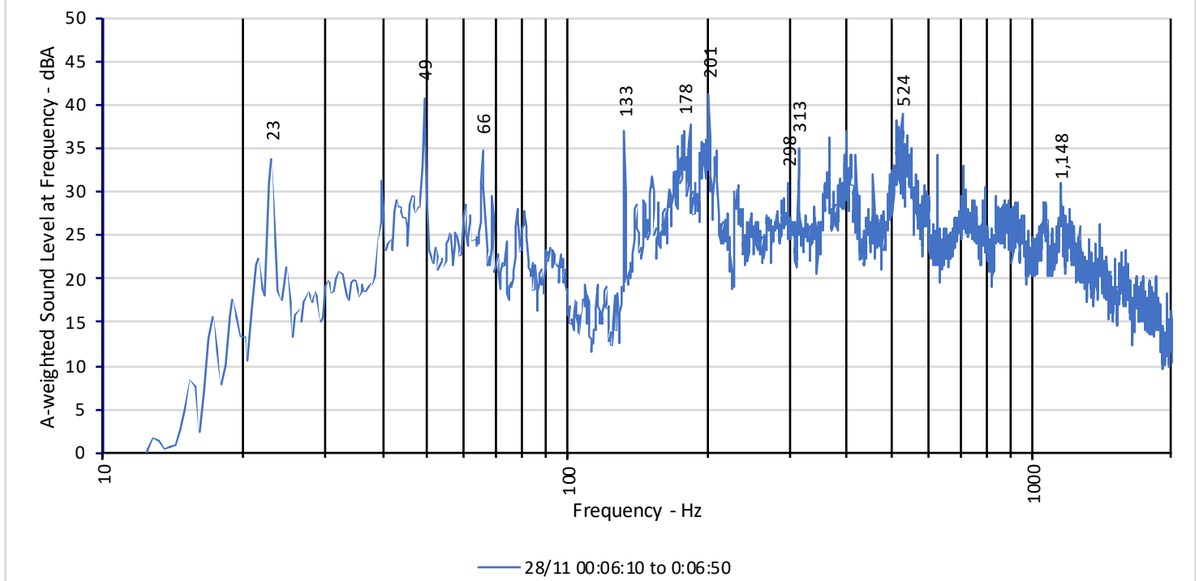
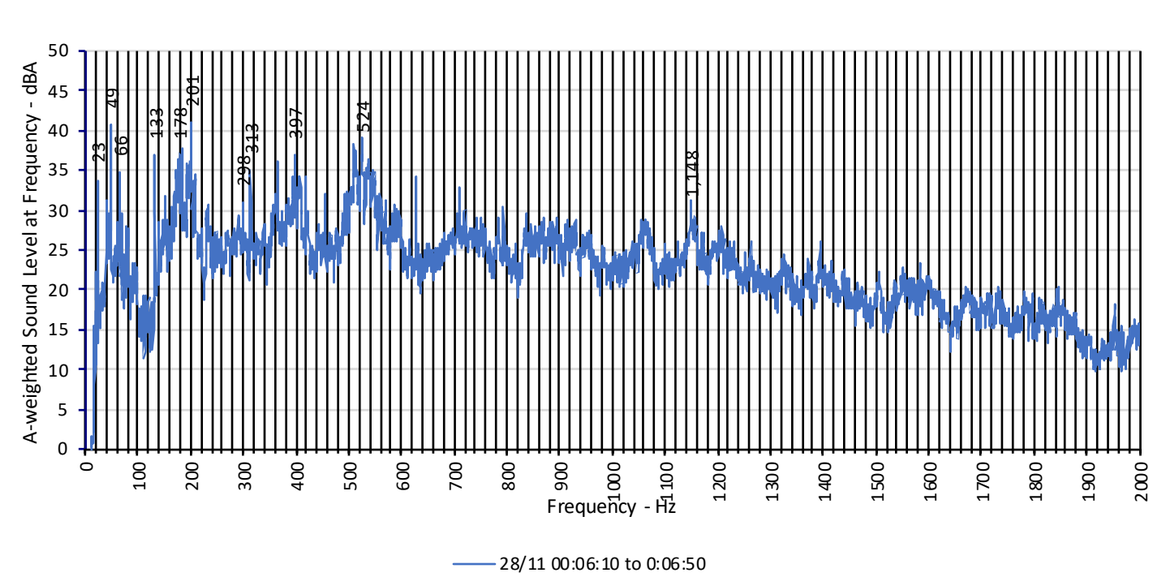


Figure E3: A2



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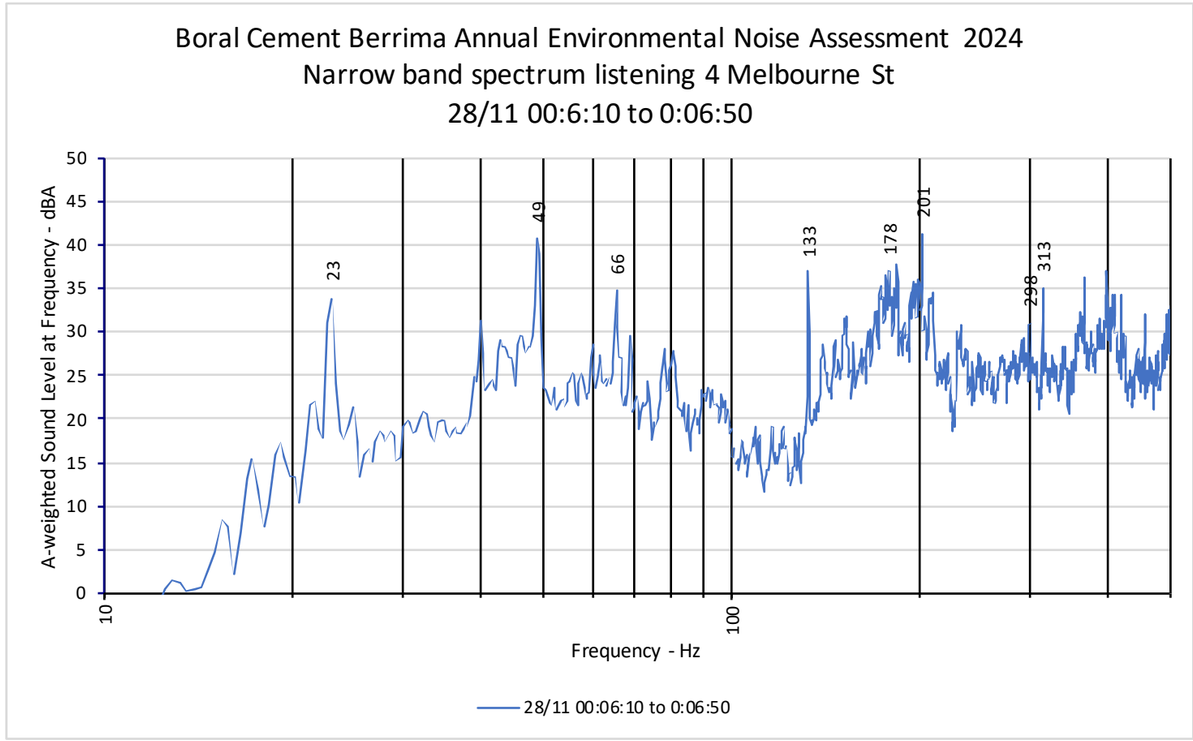


Figure E3: A3

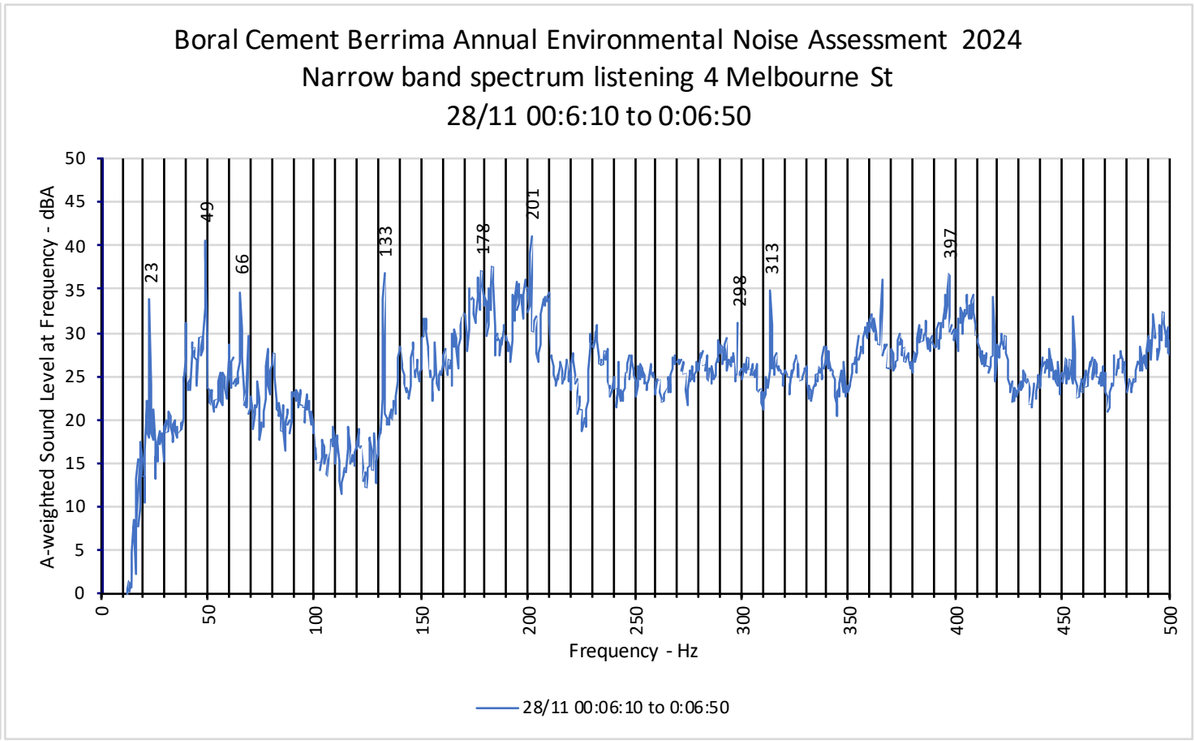


Figure E3: B3

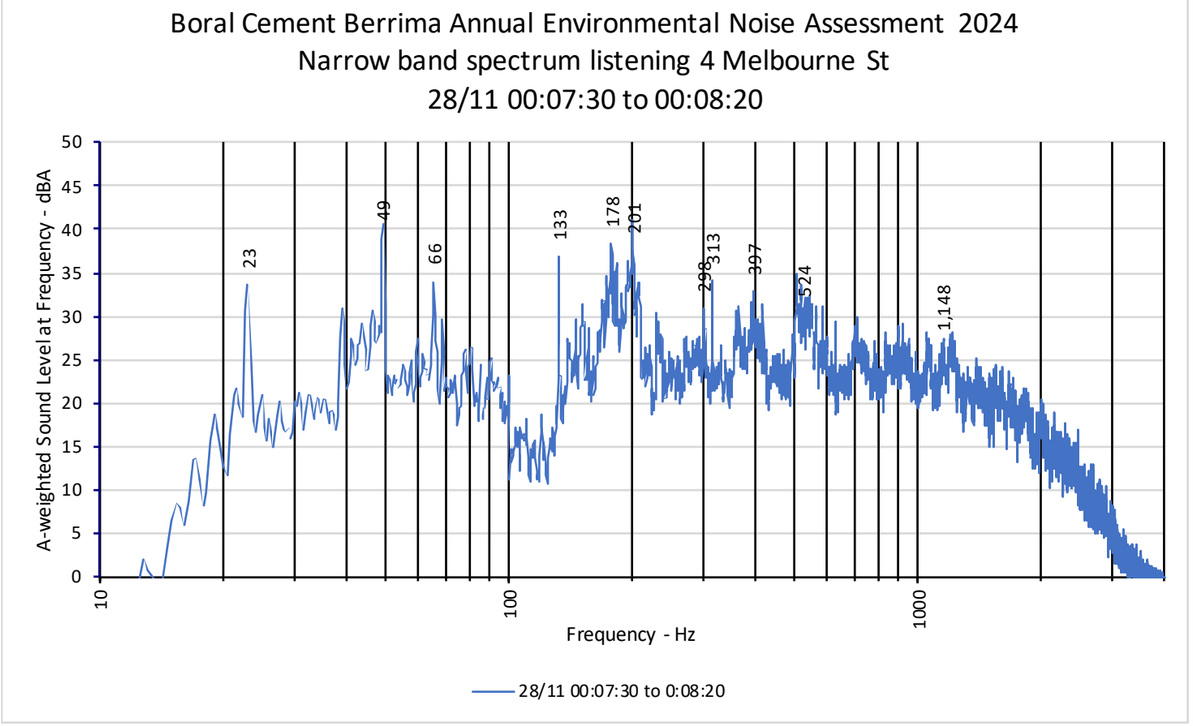
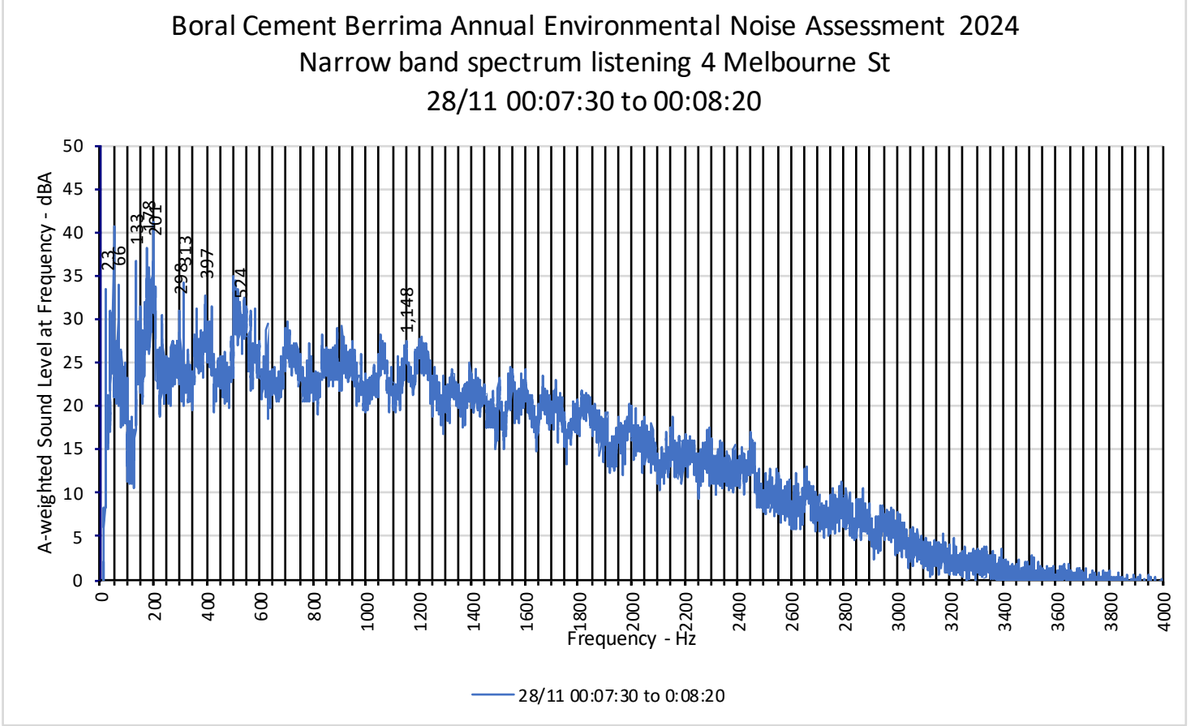


Figure E4: A1



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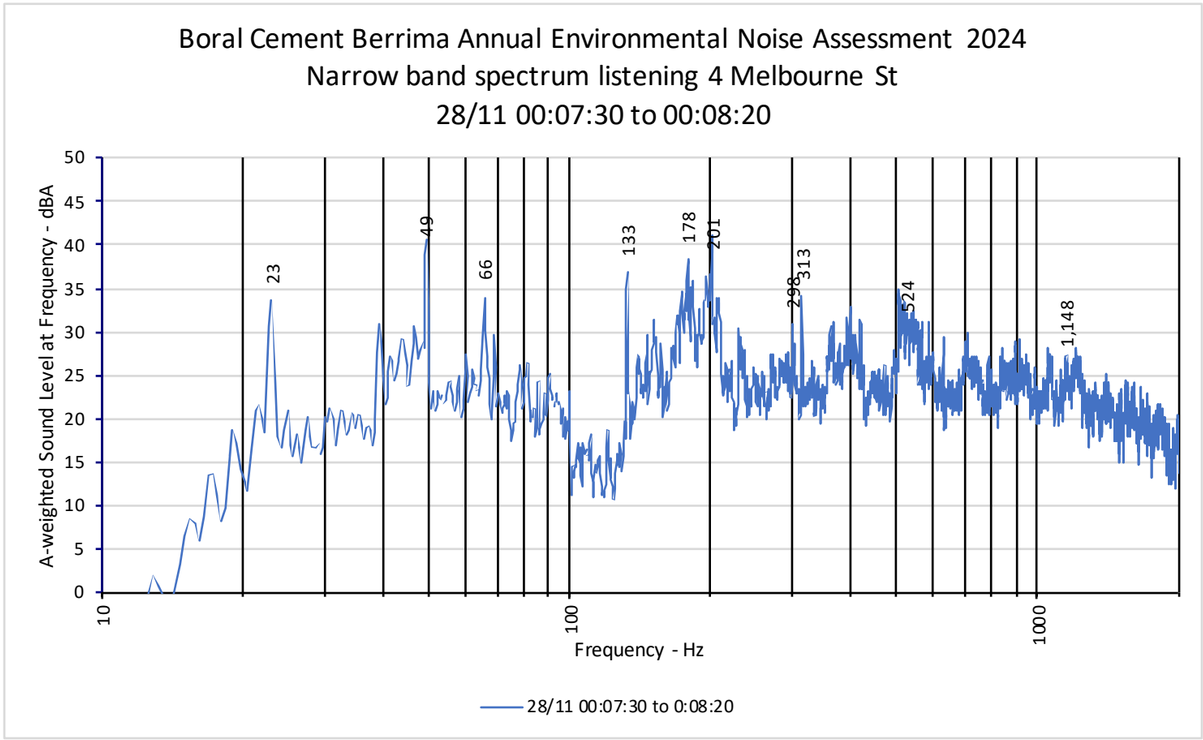

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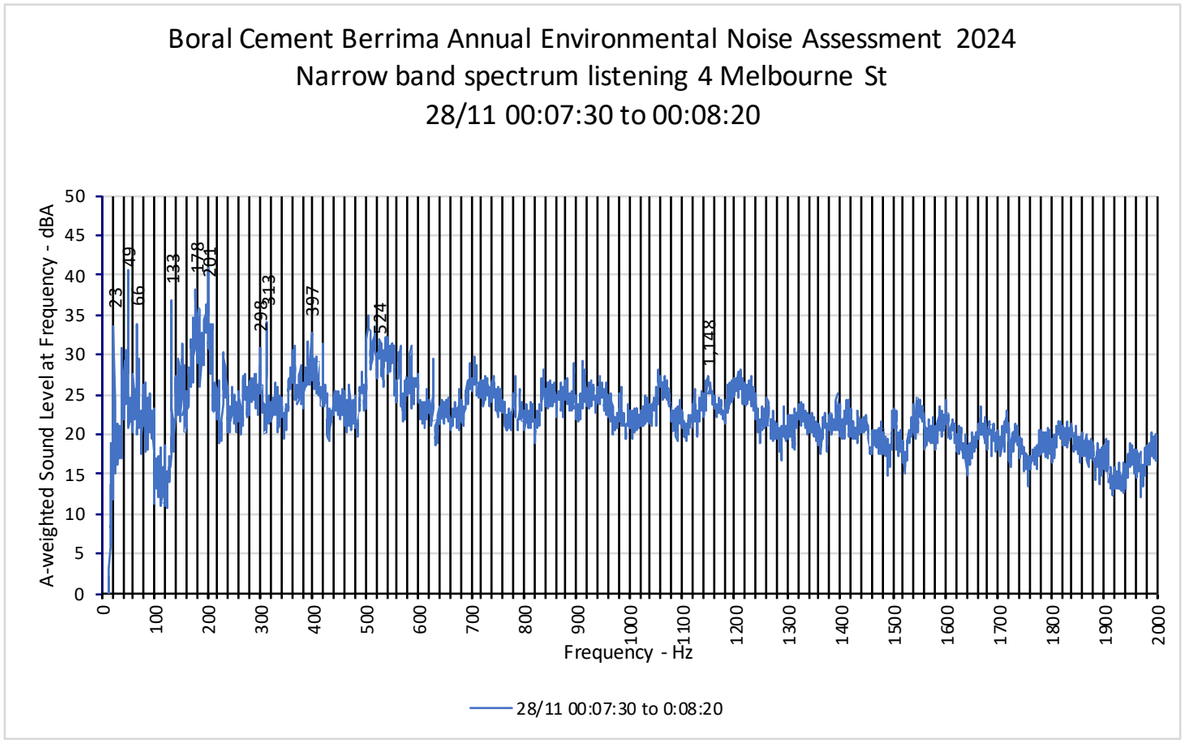

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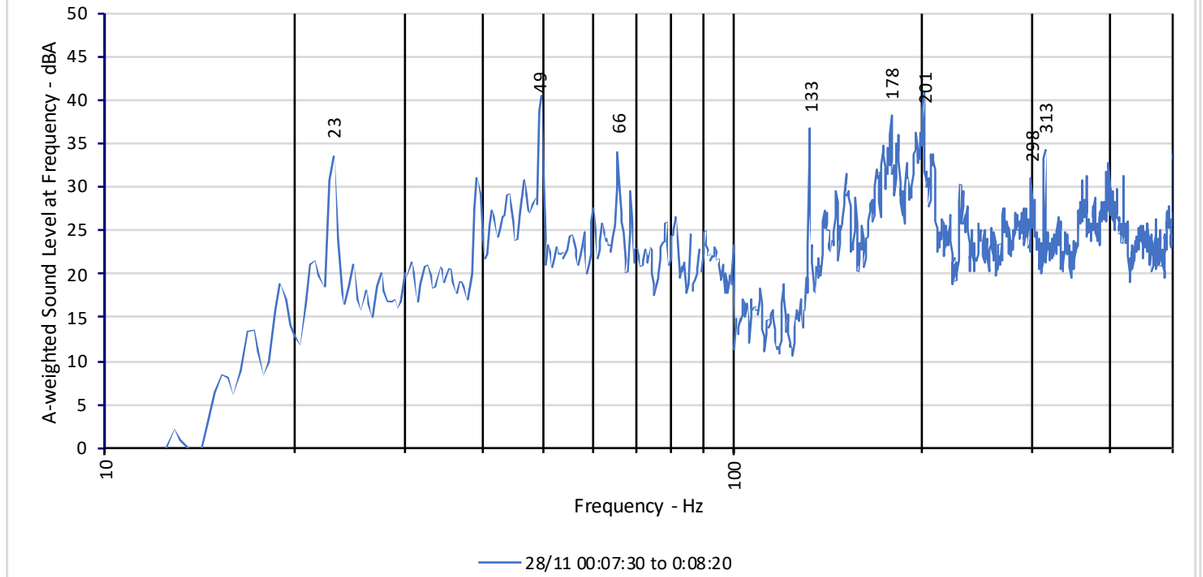

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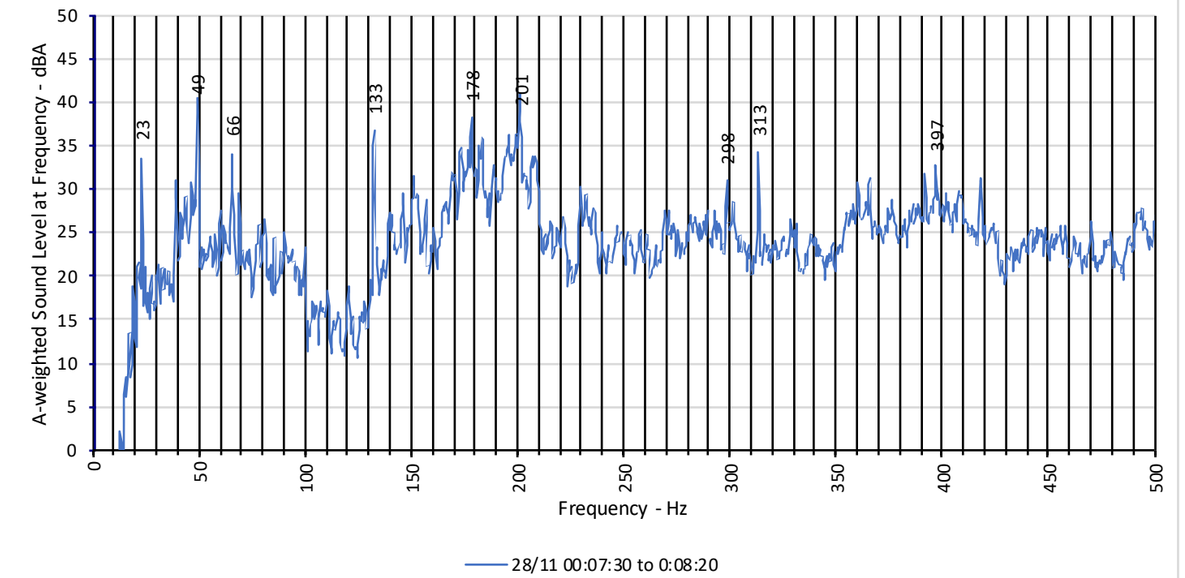


Figure E4: B3

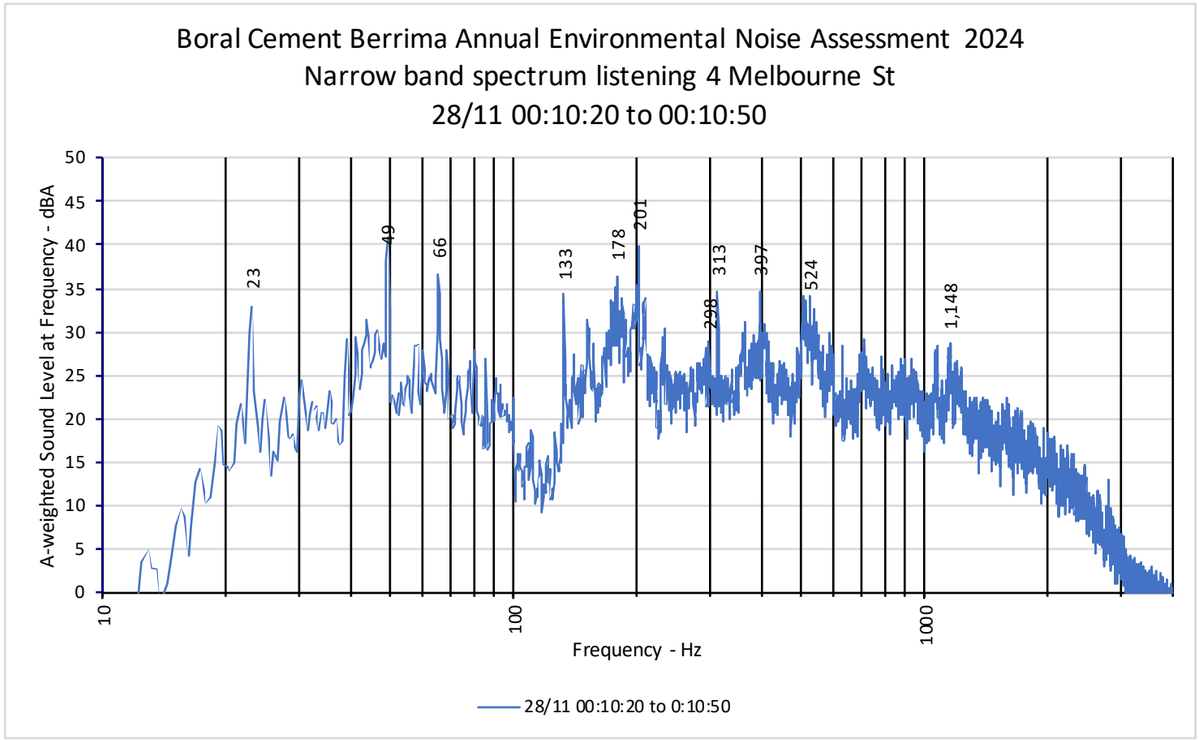


Figure E5: A1

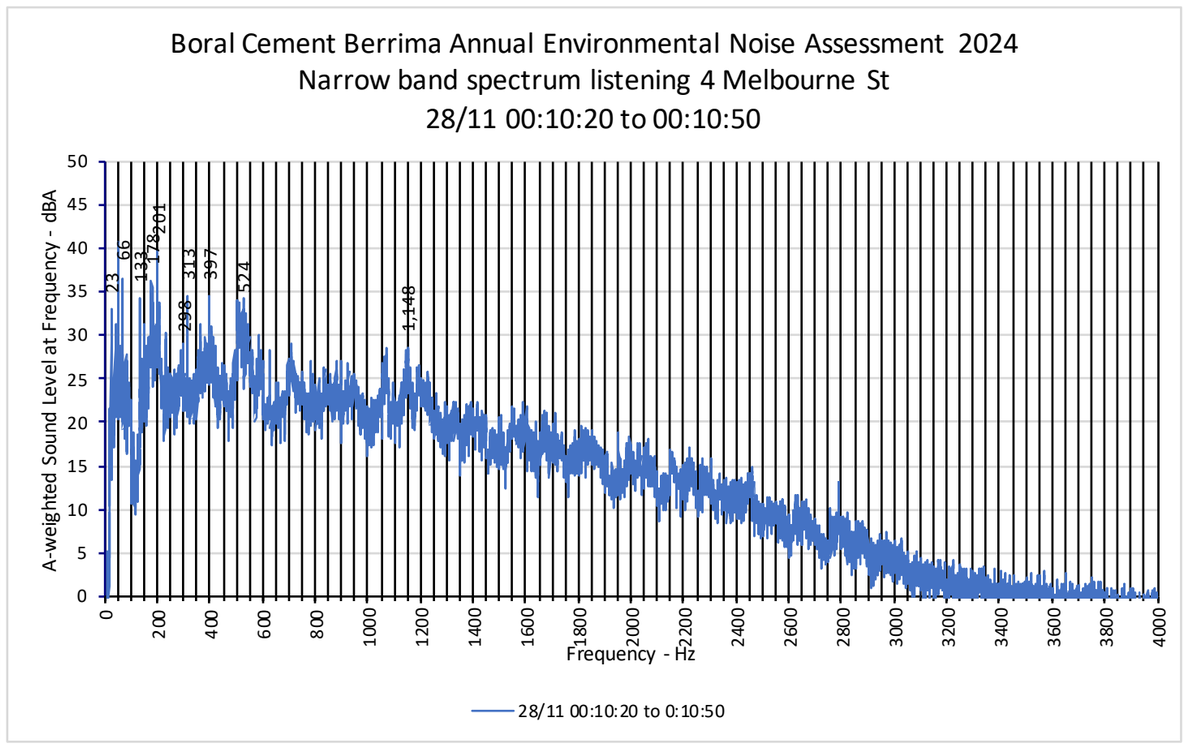
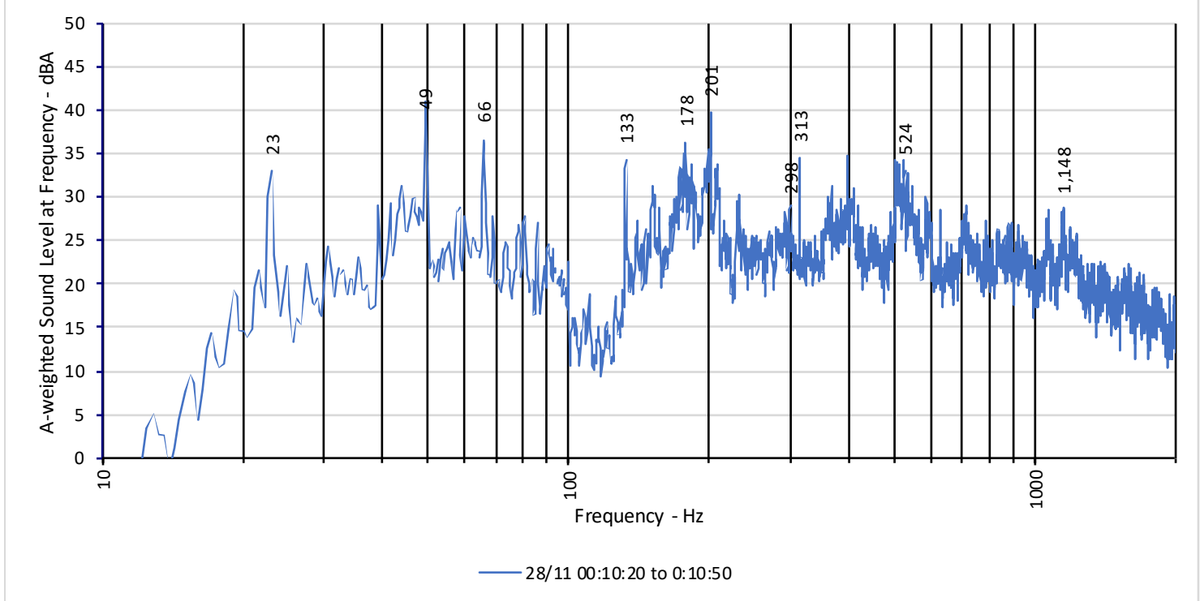


Figure E5: B1



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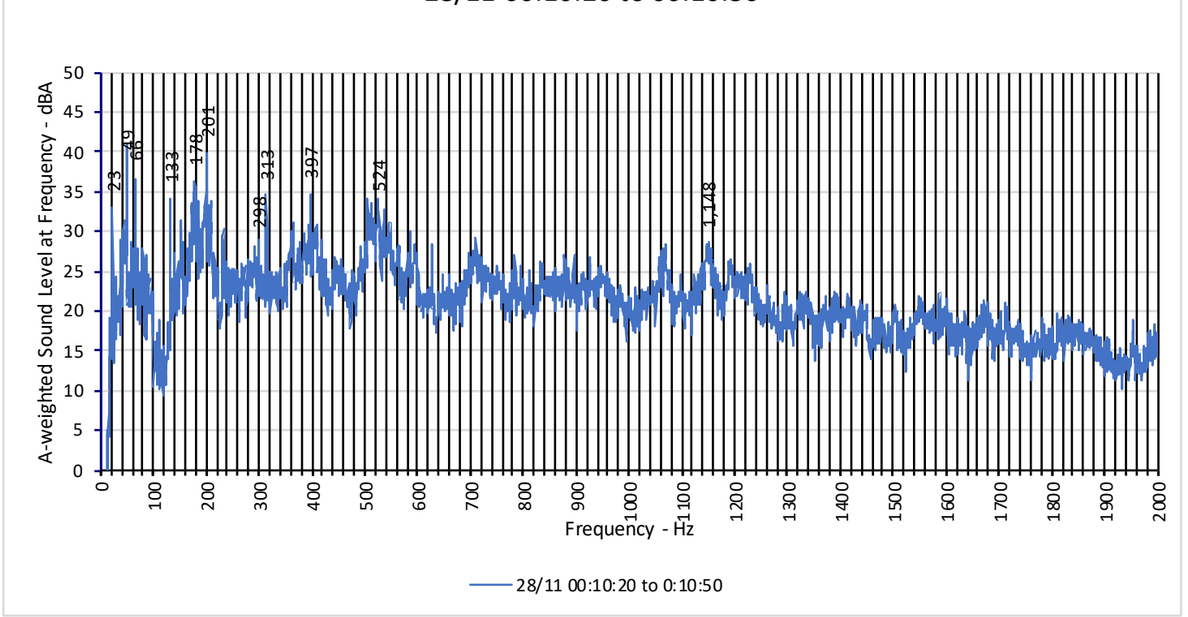

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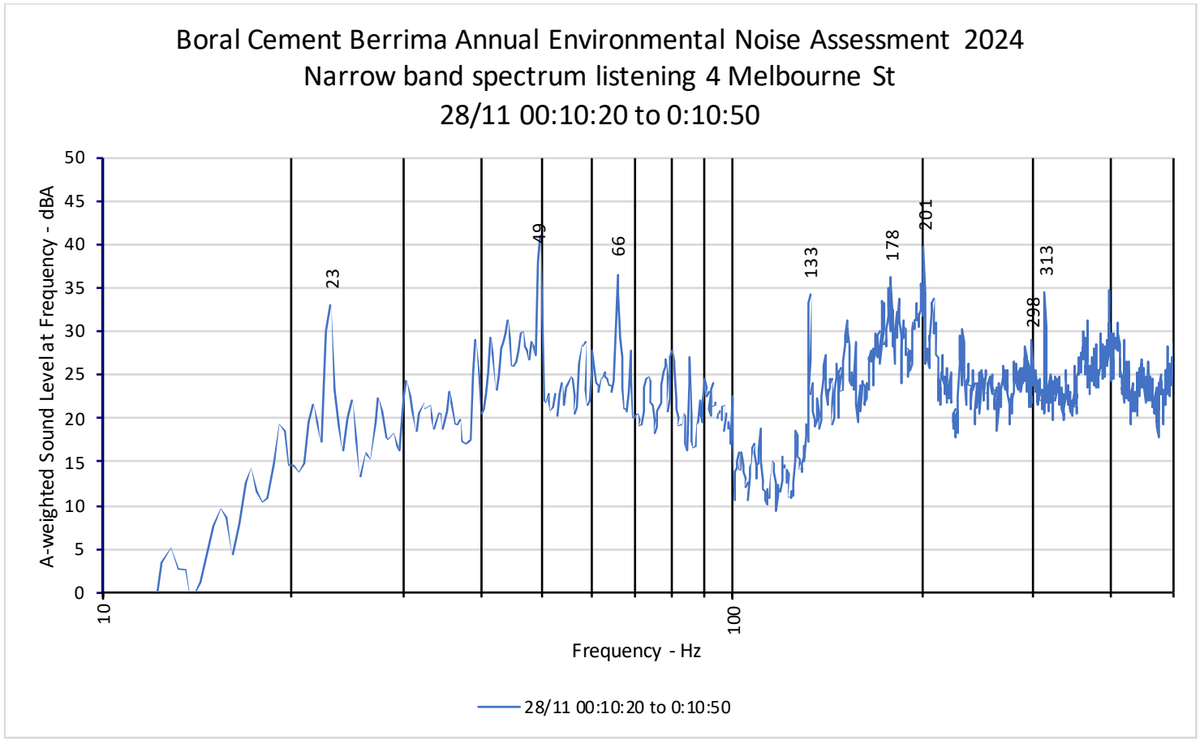

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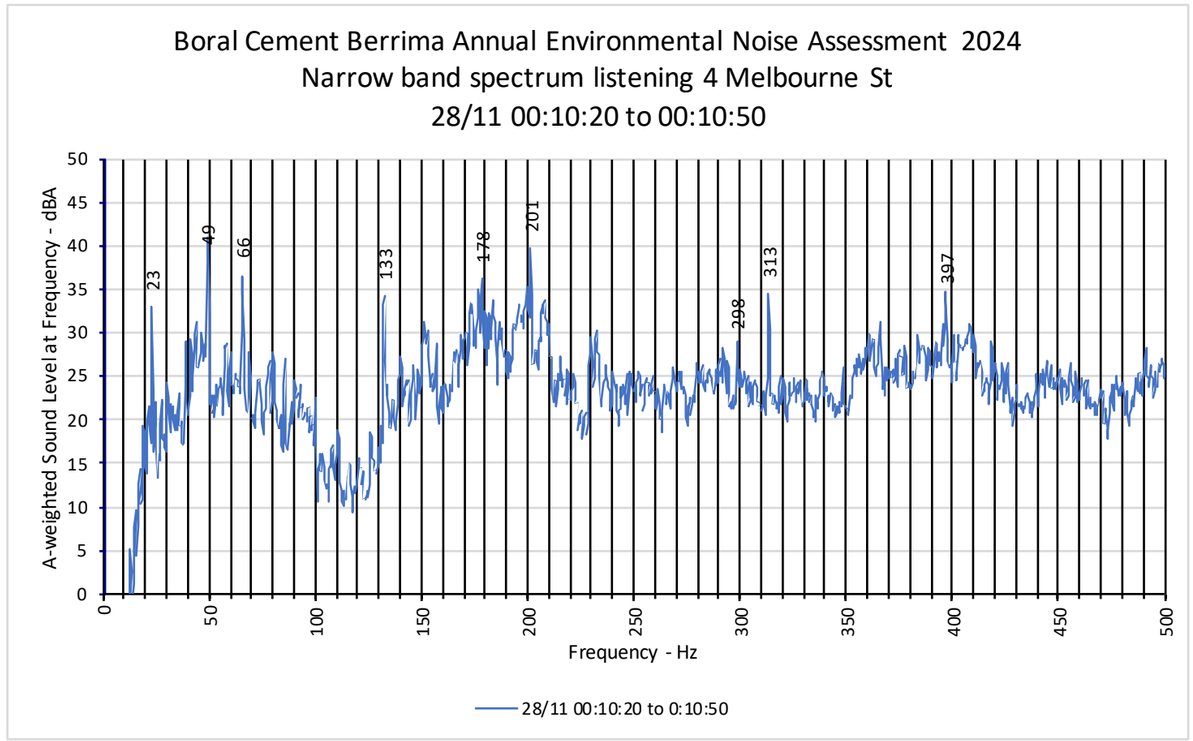


Figure E5: B3

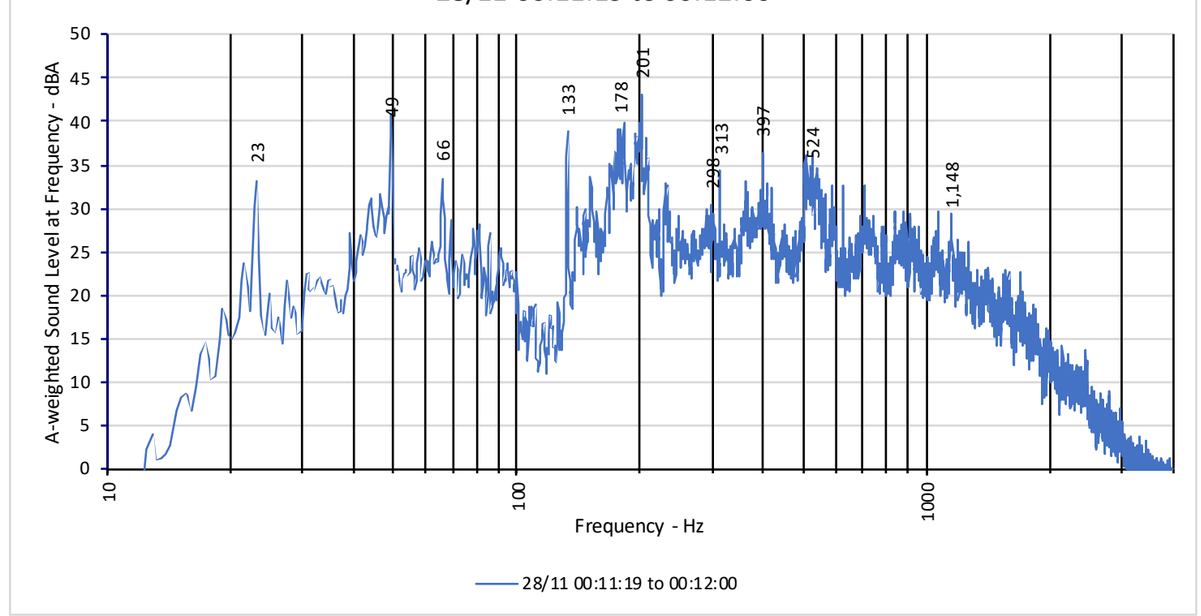


Figure E6: A1

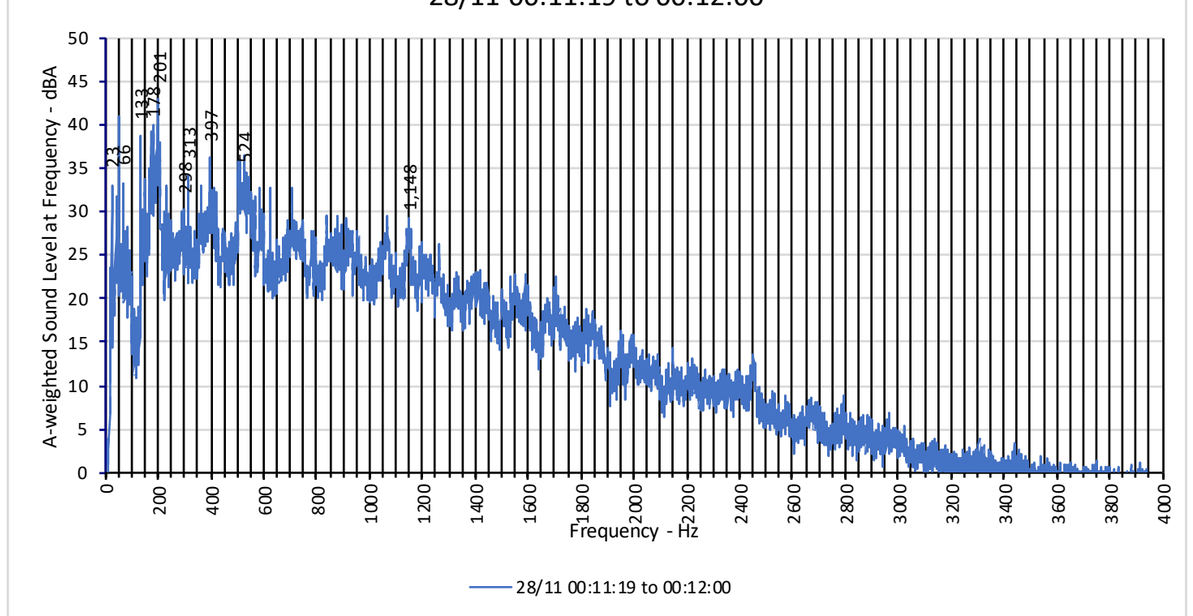
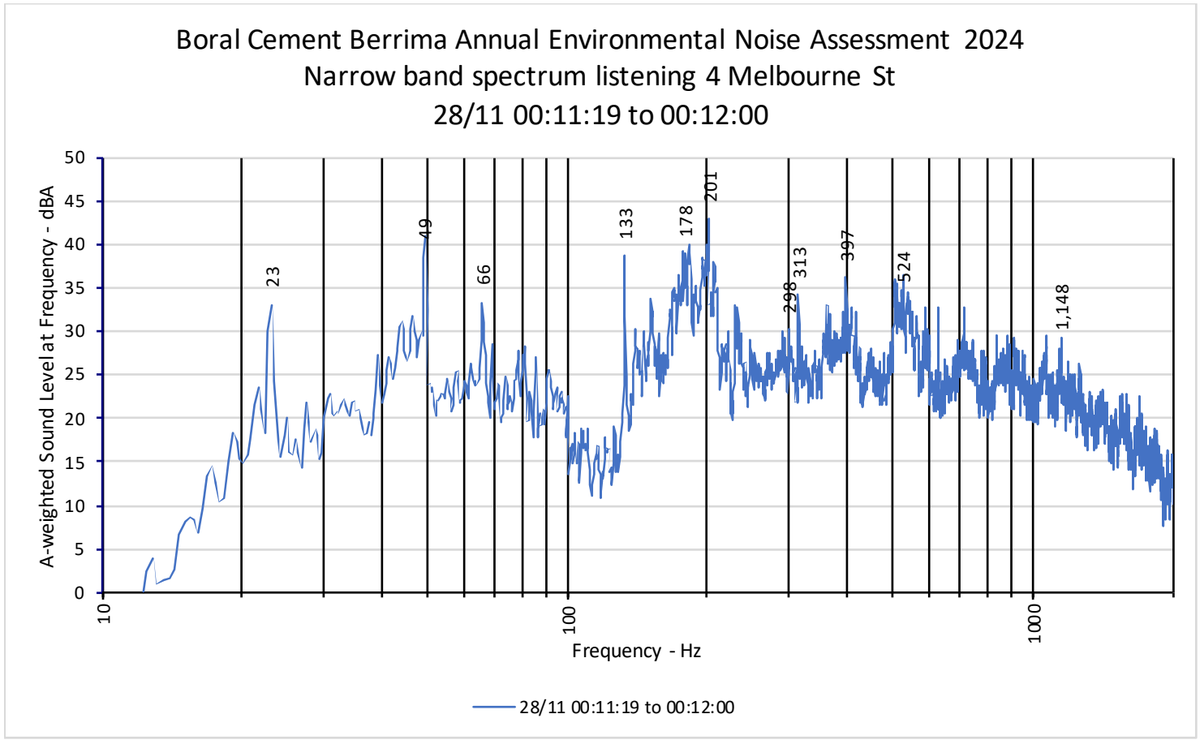


Figure E6: B1



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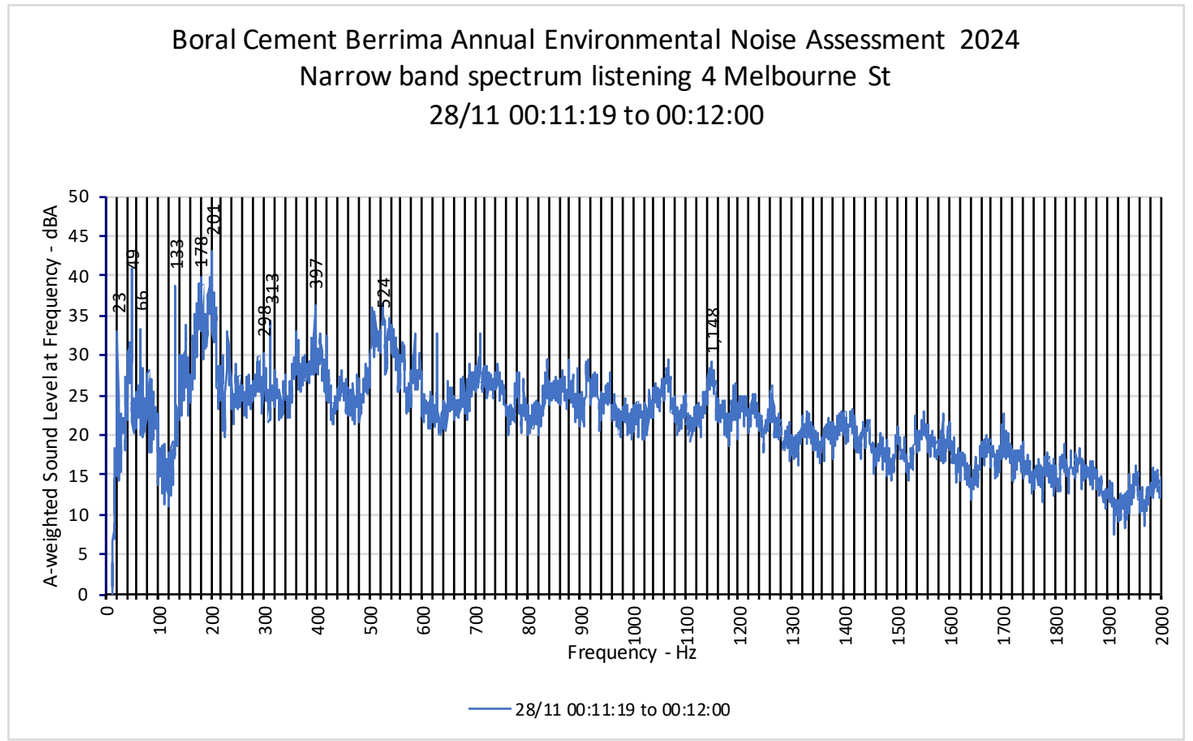

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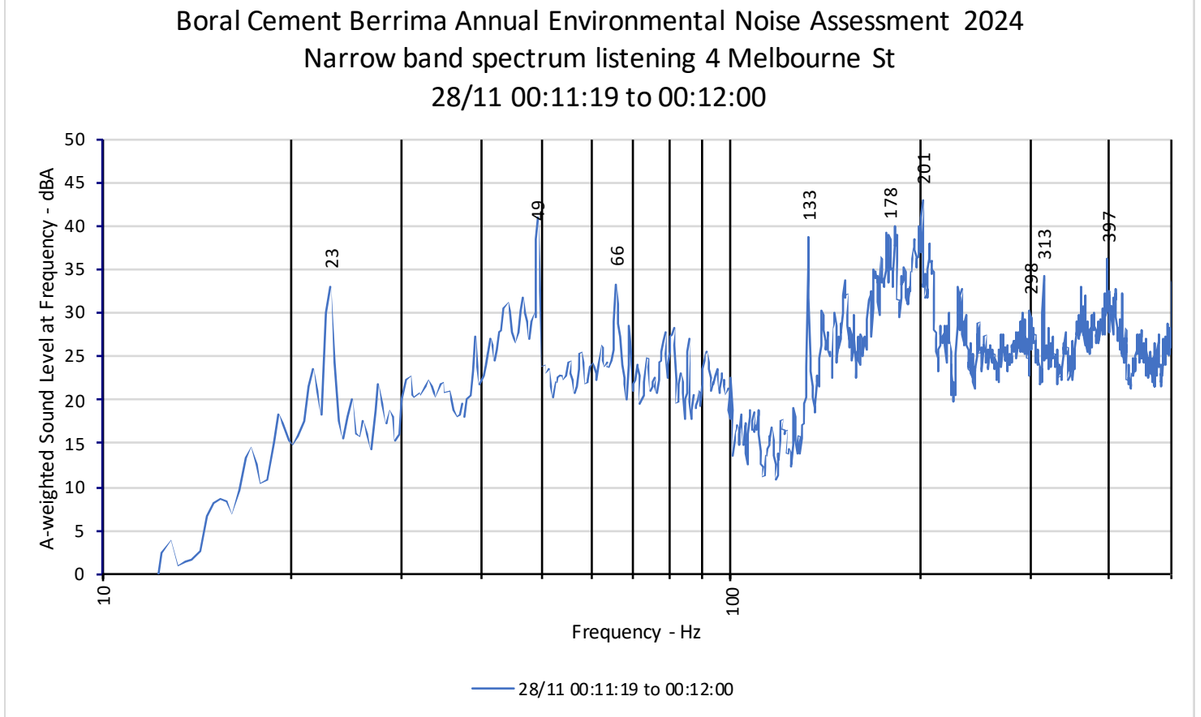


Figure E6: A3

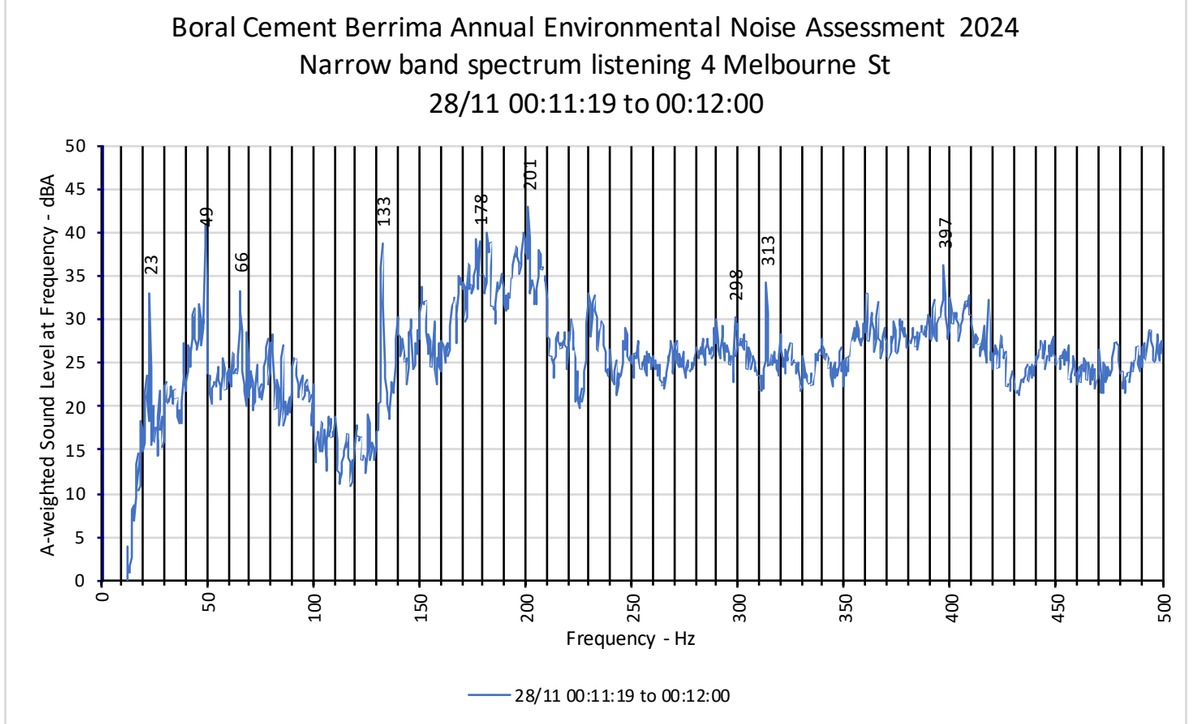


Figure E6: B3

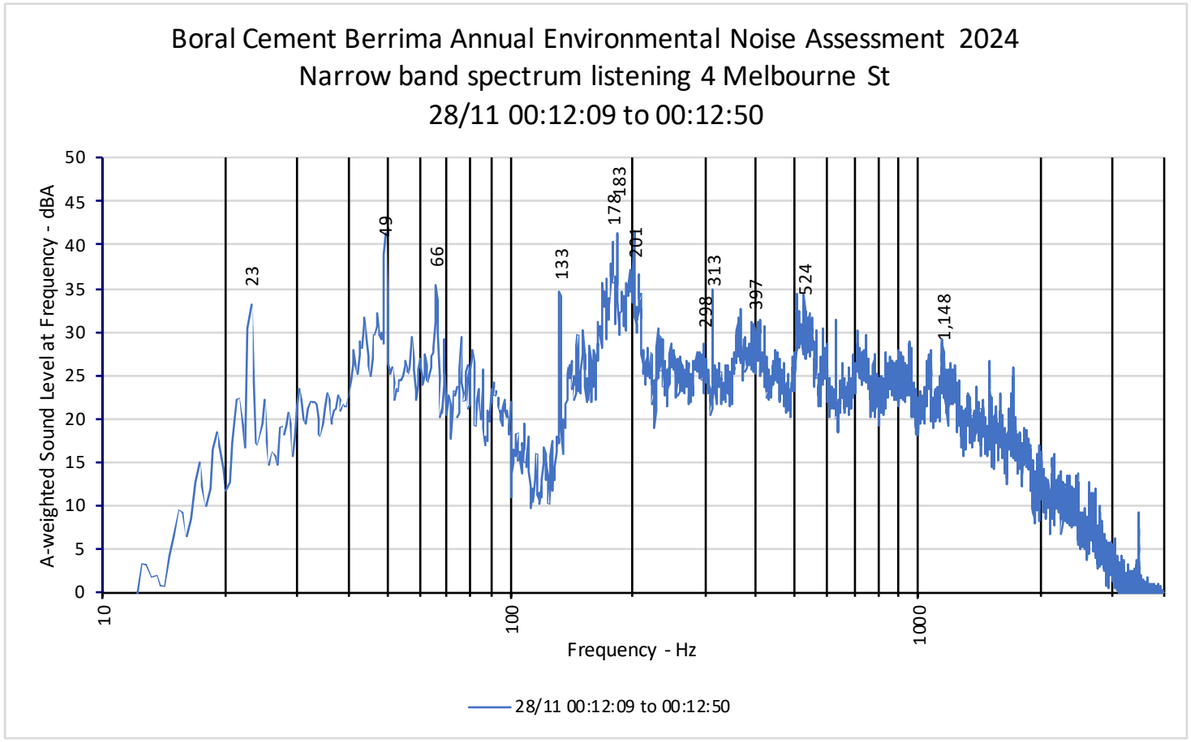


Figure E7: A1

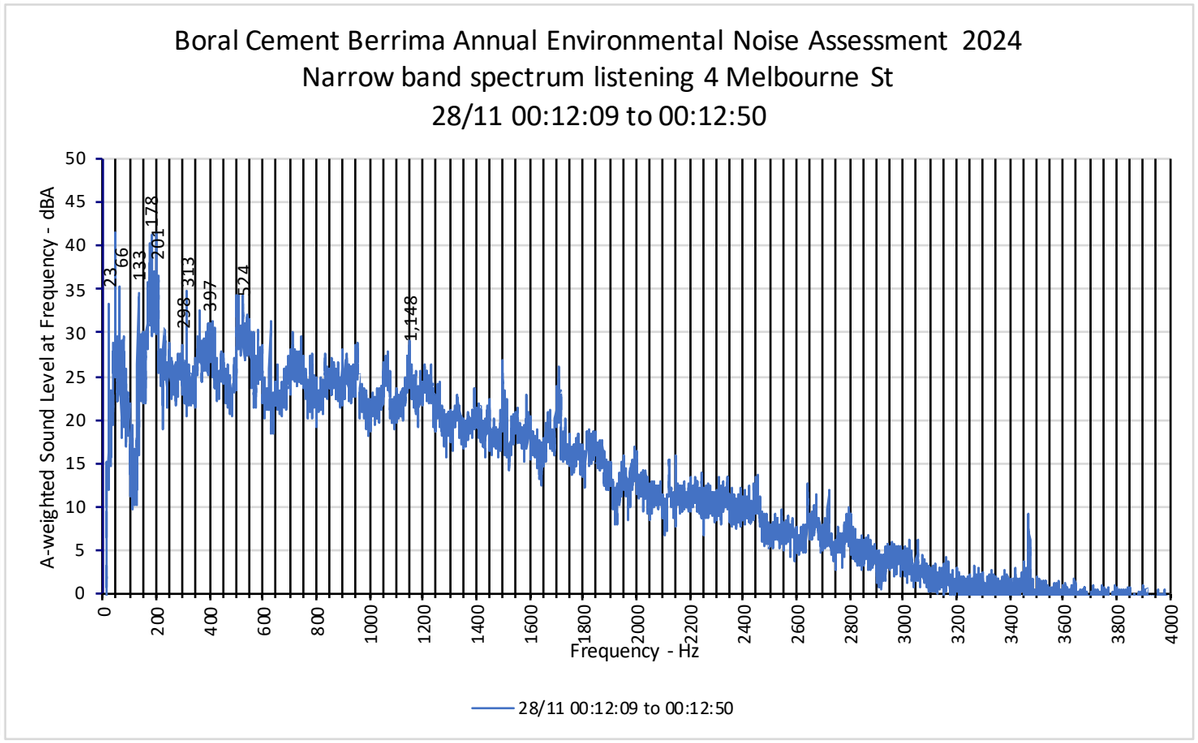


Figure E7: B1

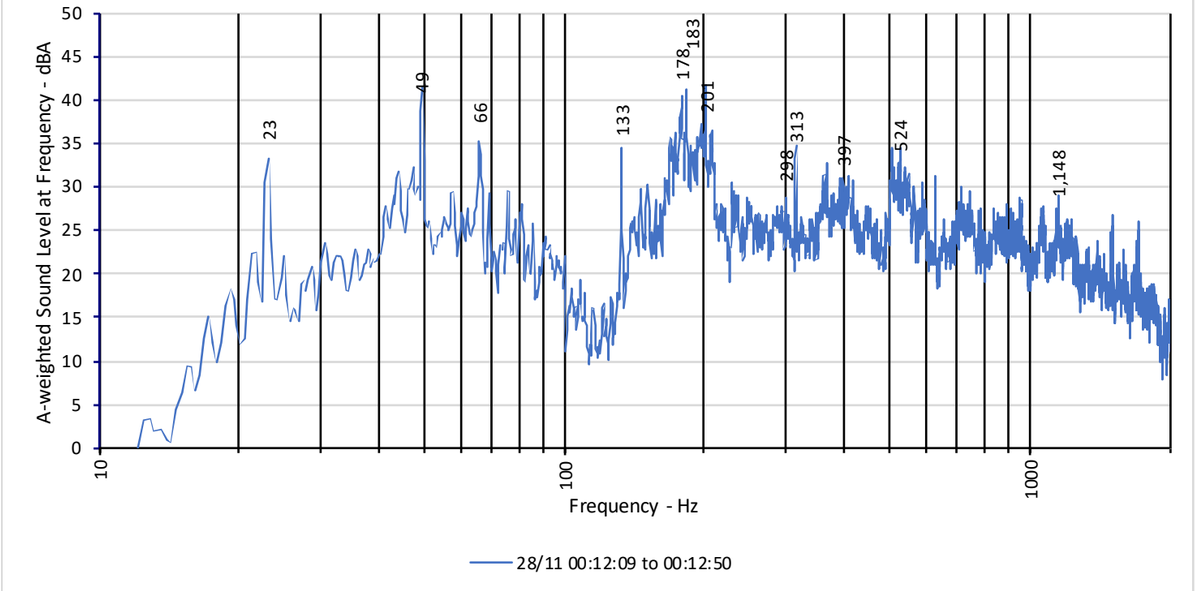


Figure E7: A2

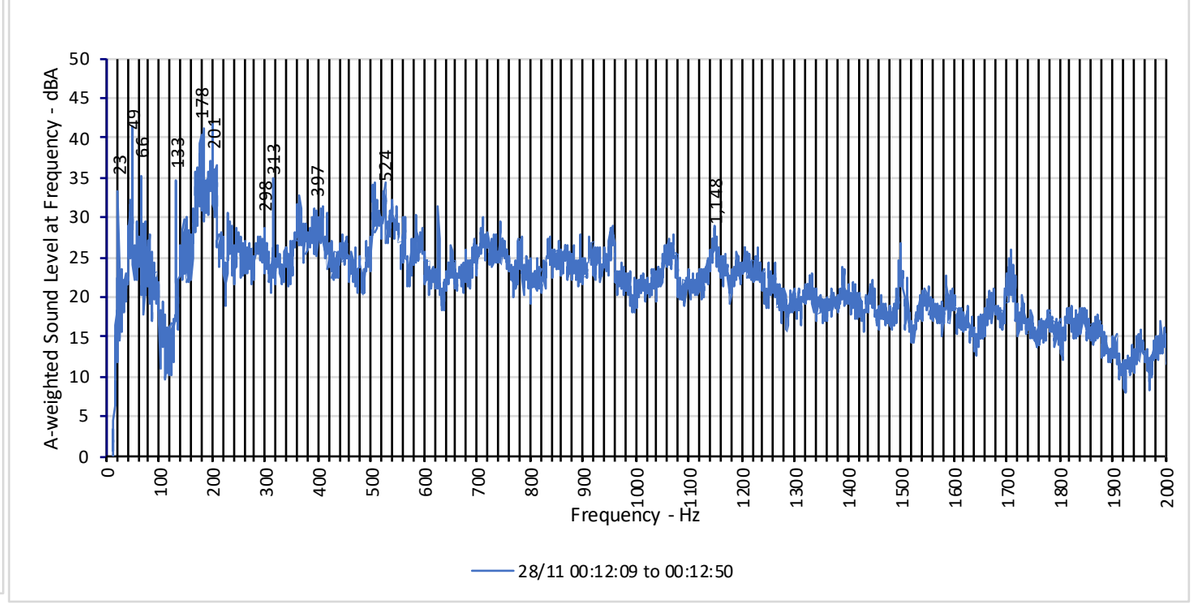


Figure E7: B2

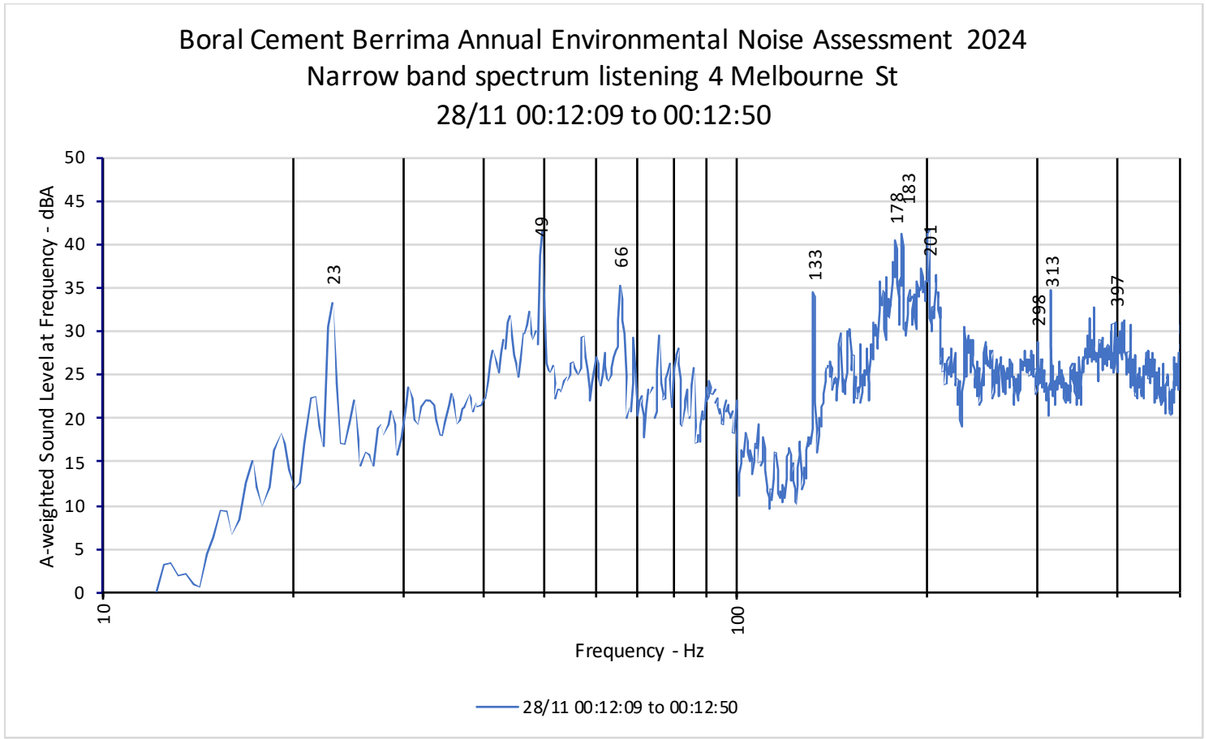


Figure E7: A3

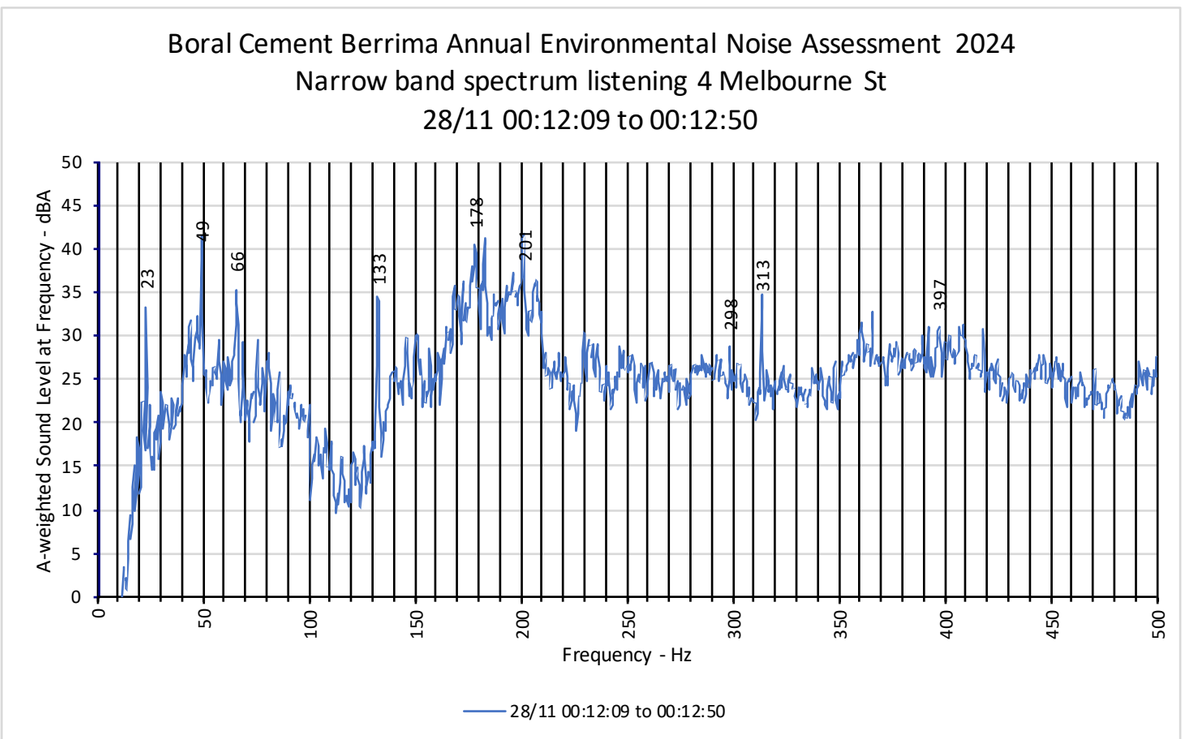


Figure E7: B3

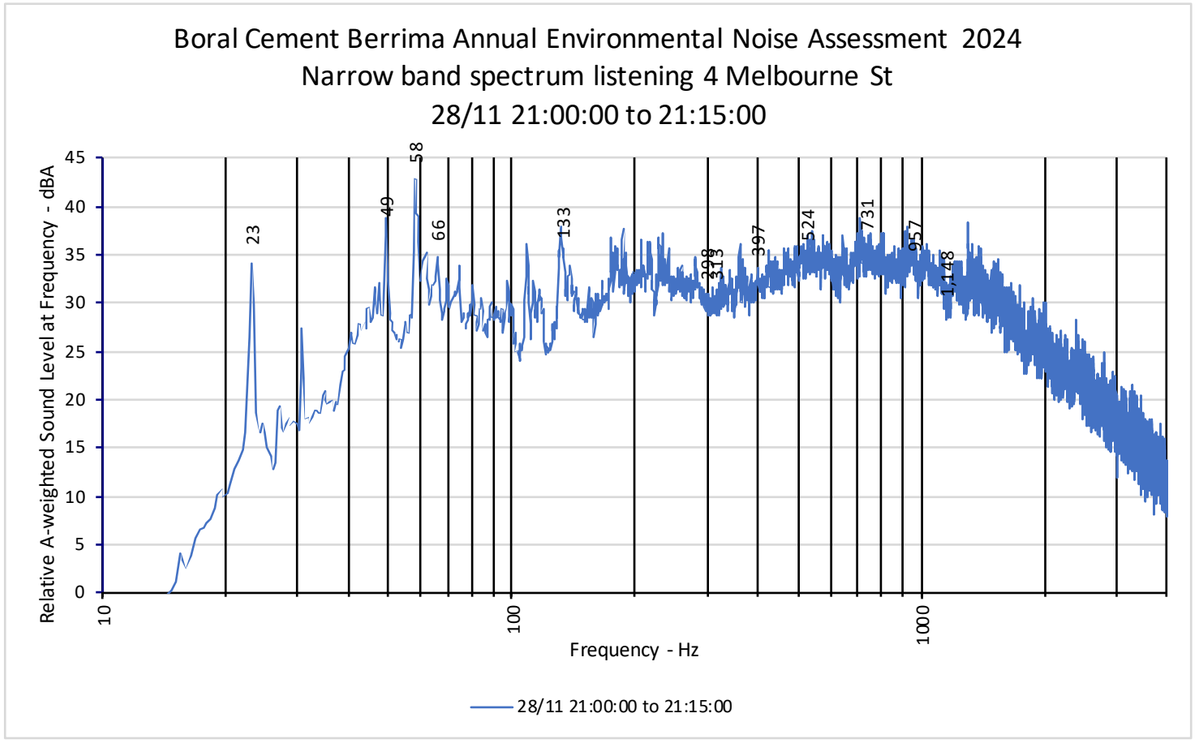


Figure E8: A1

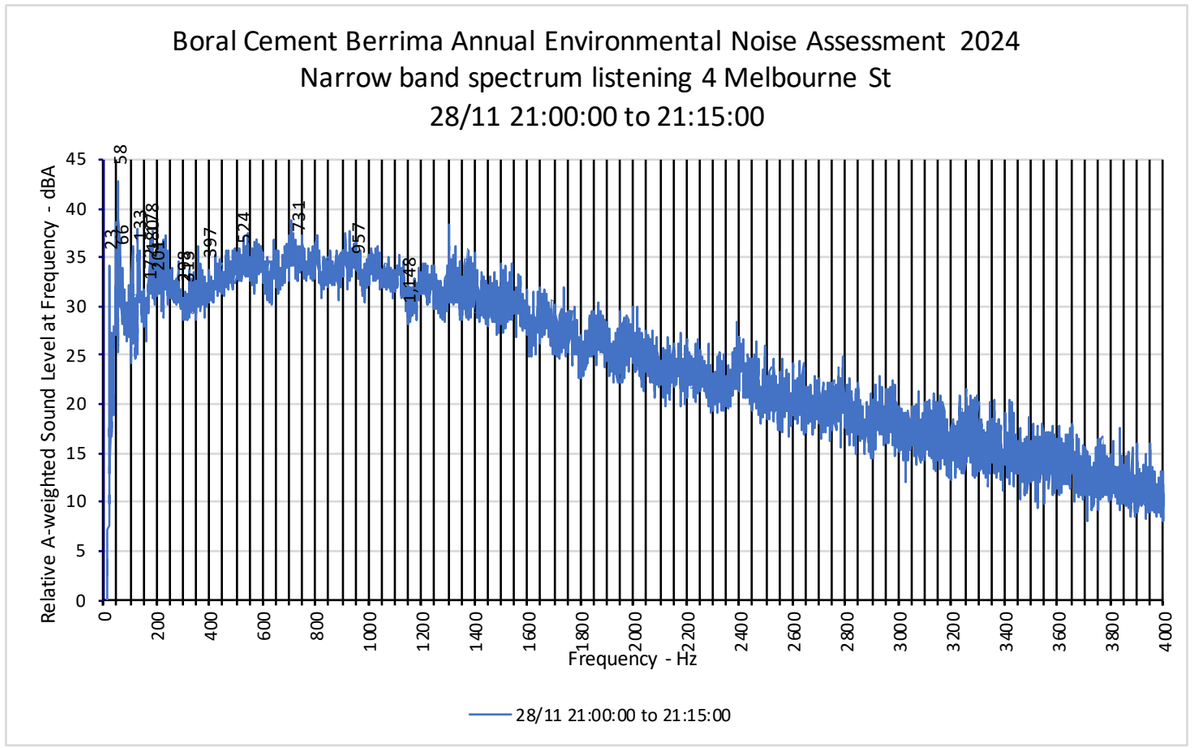


Figure E8: B1

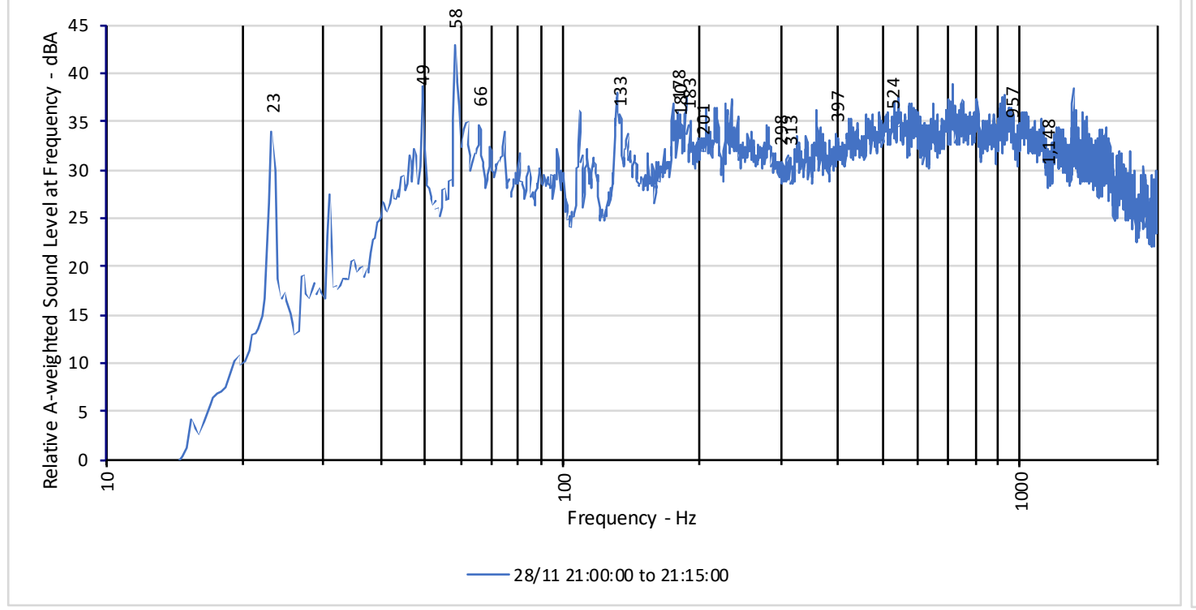


Figure E8: A2

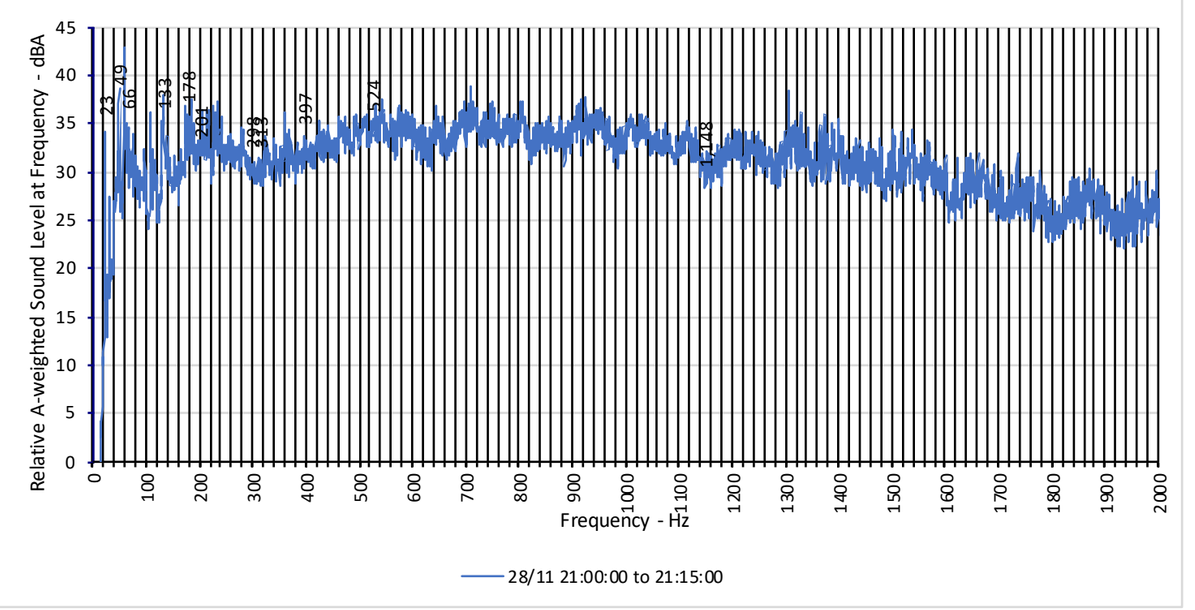


Figure E8: B2

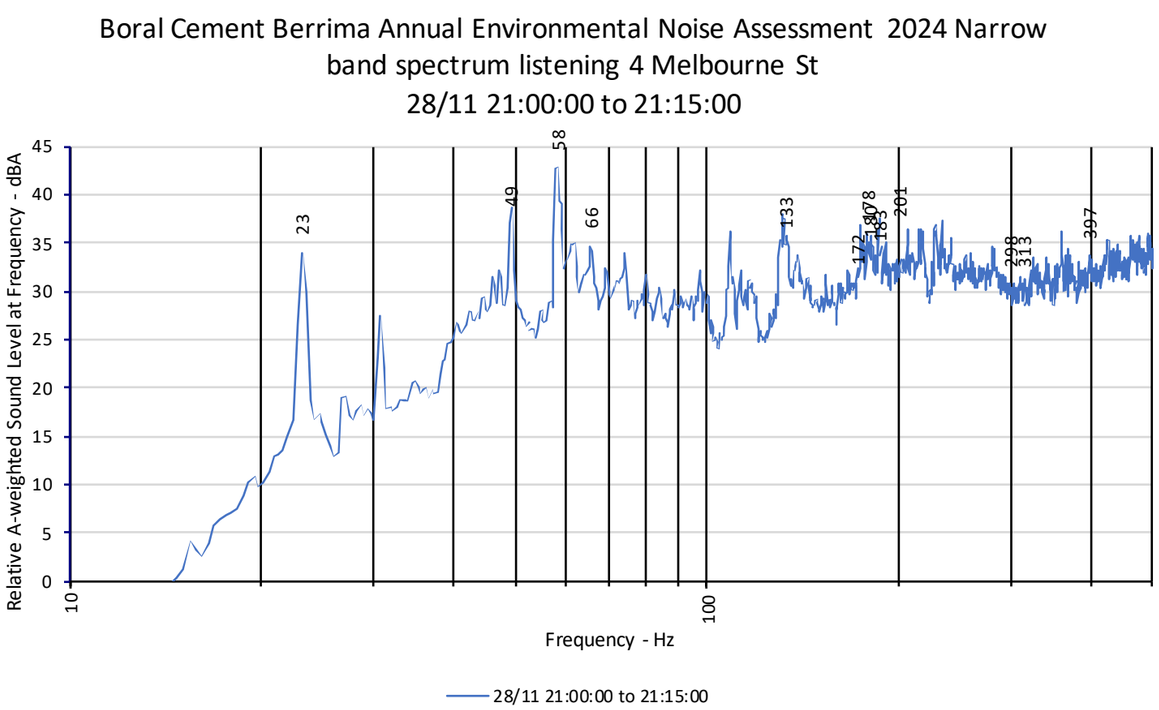


Figure E8: A3

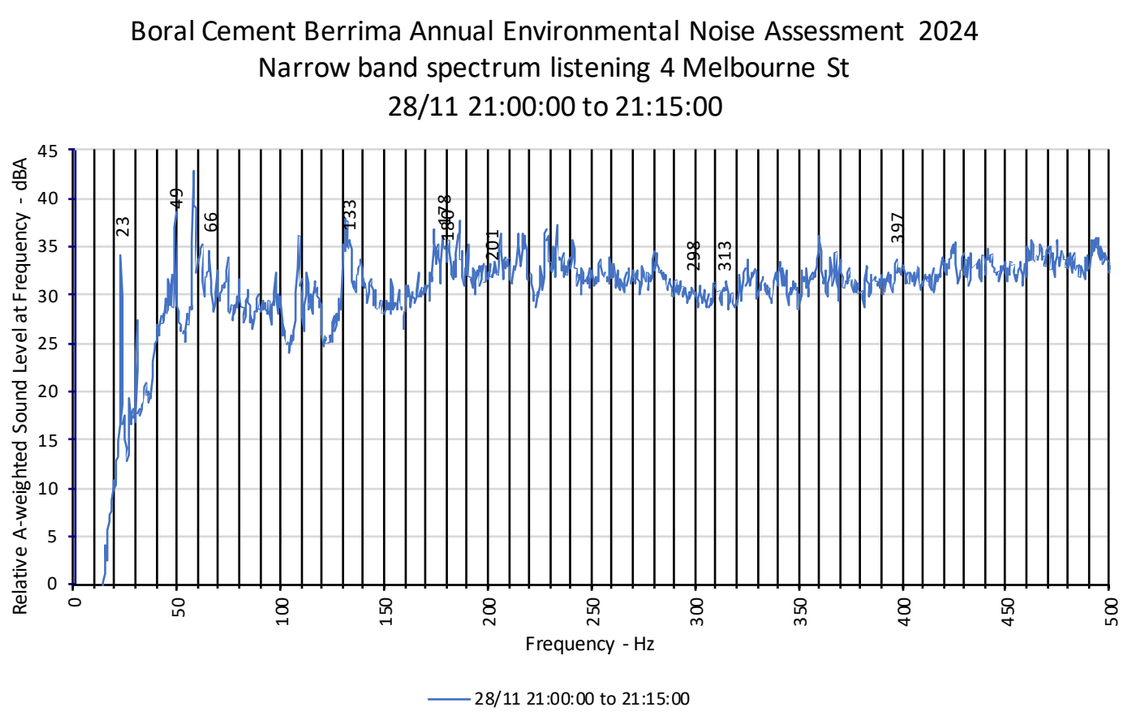


Figure E8: B3

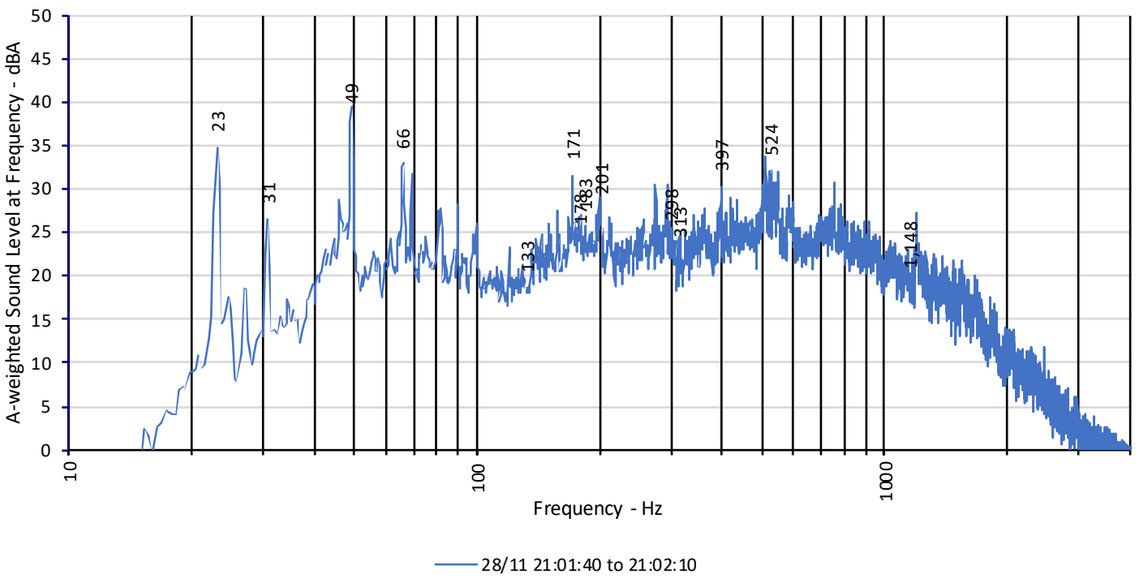


Figure E9: A1

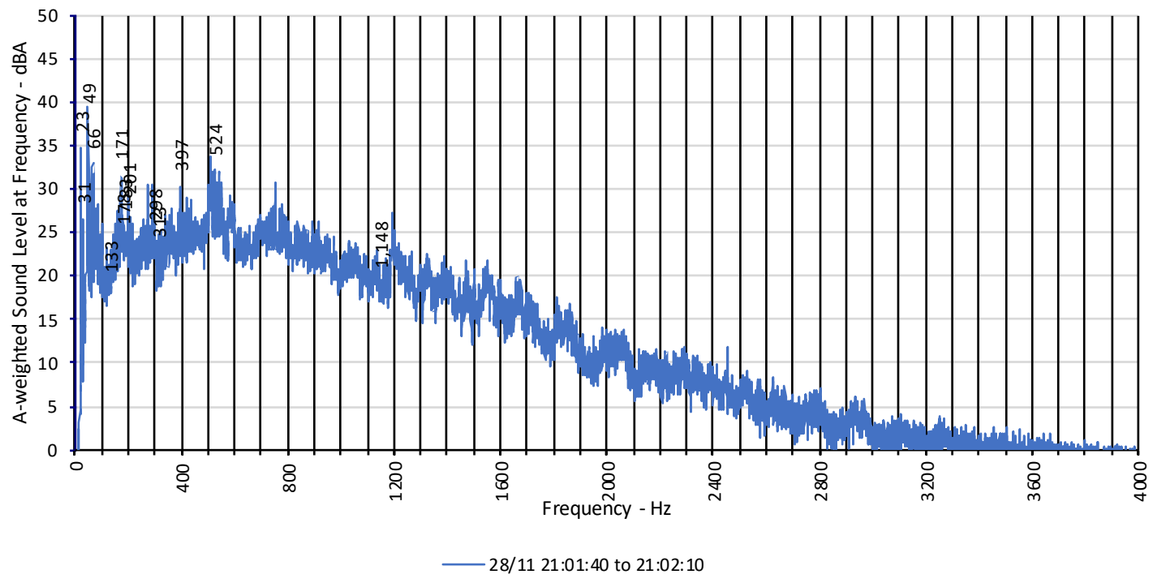


Figure E9: B1

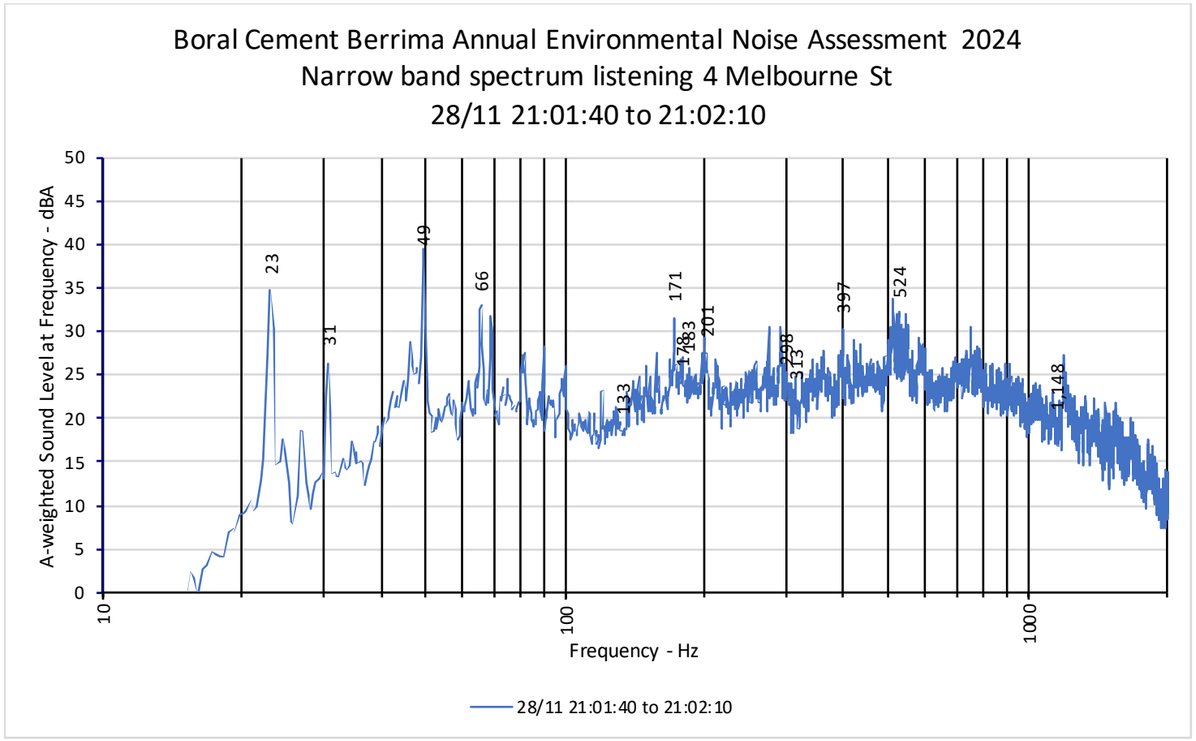
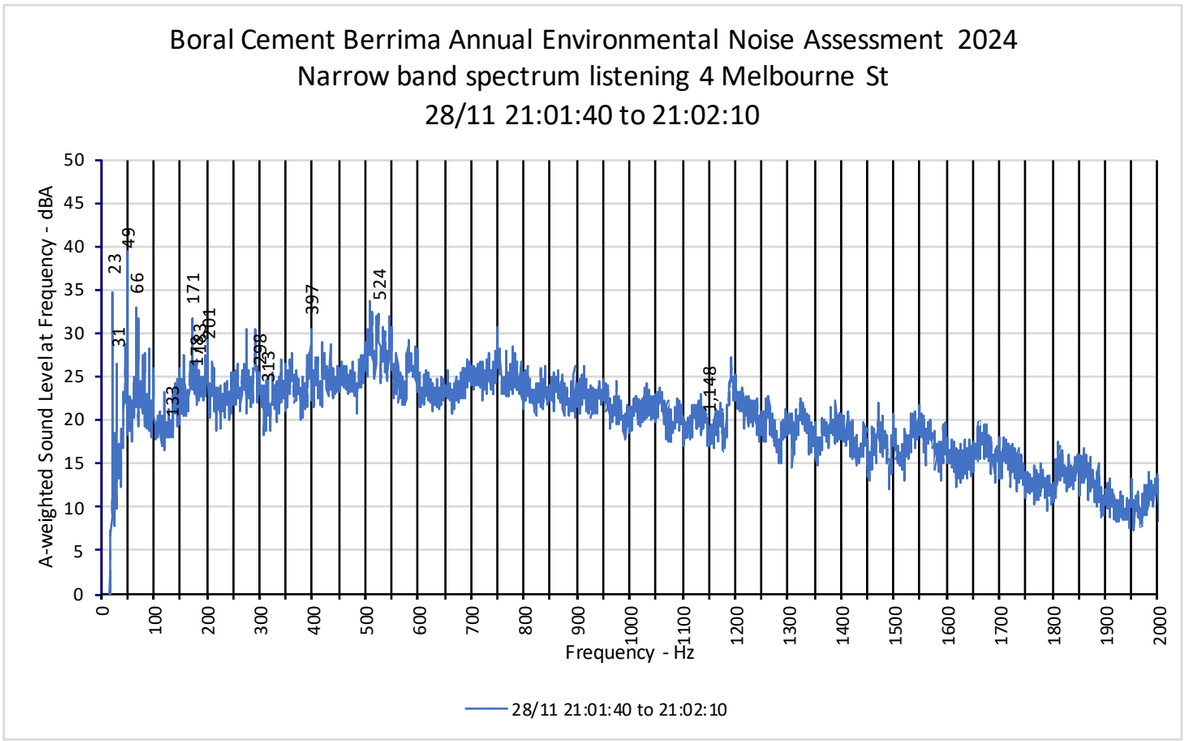


Figure E9: A2



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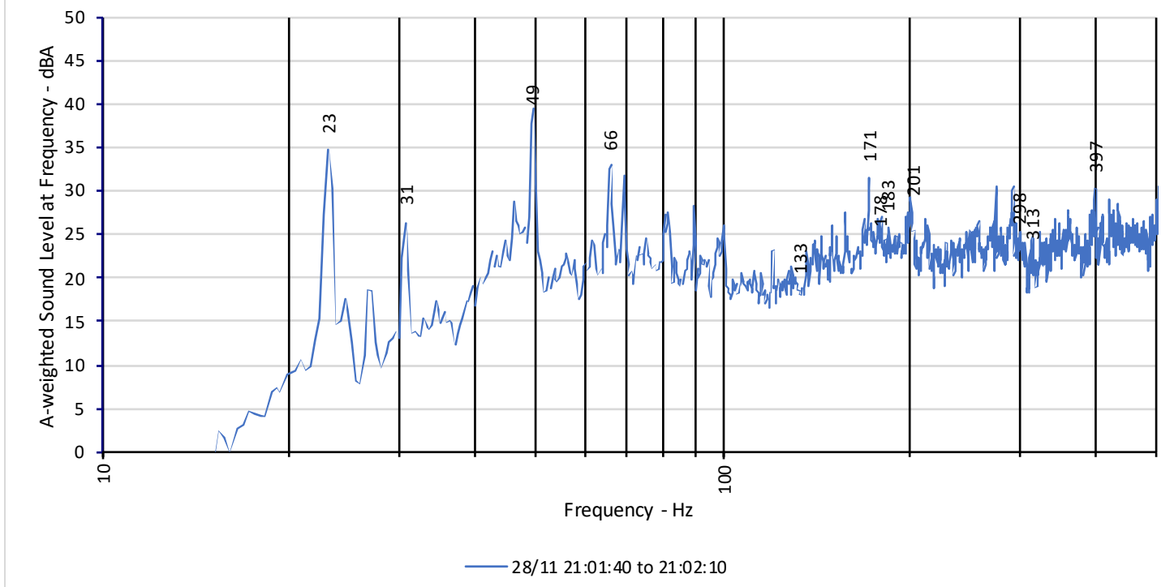

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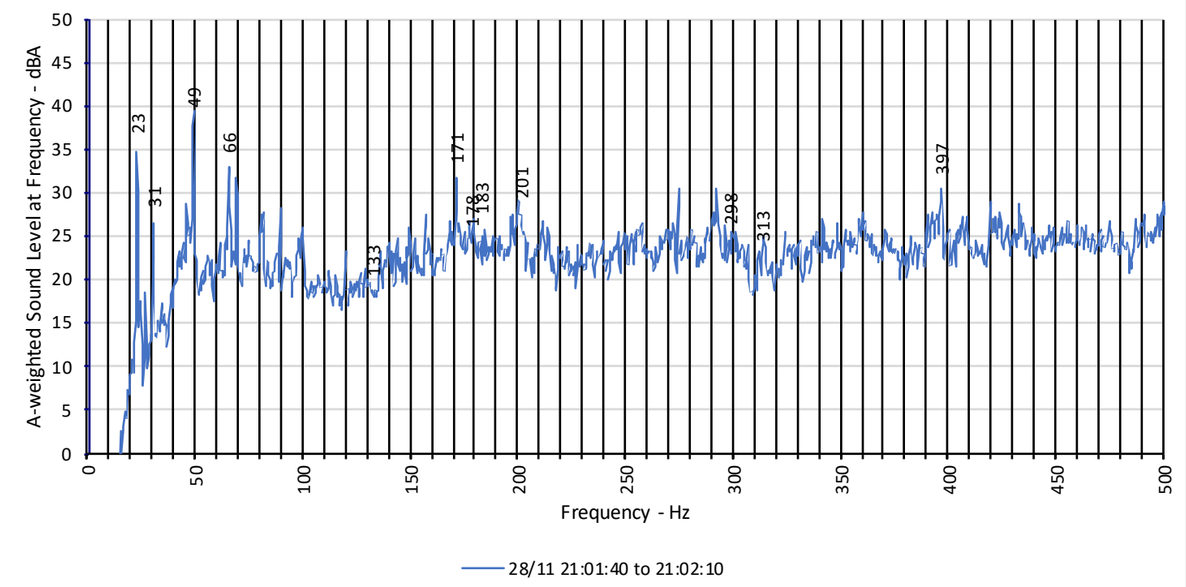


Figure E9: B3

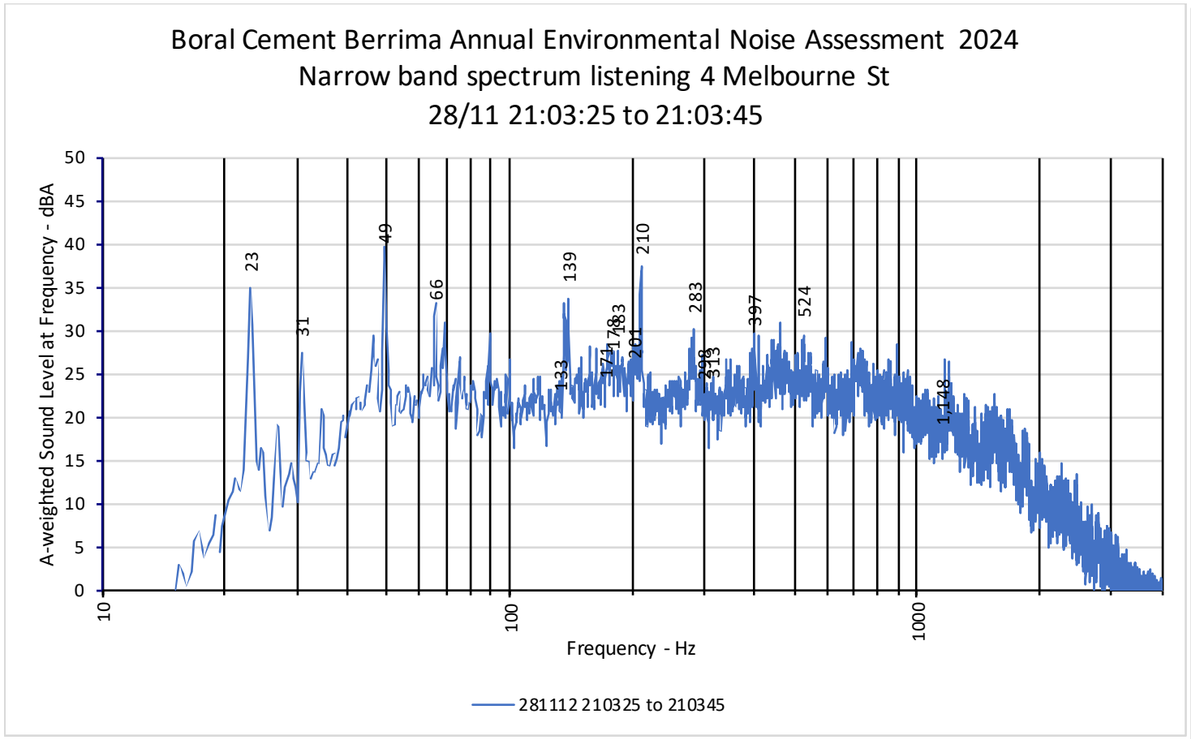
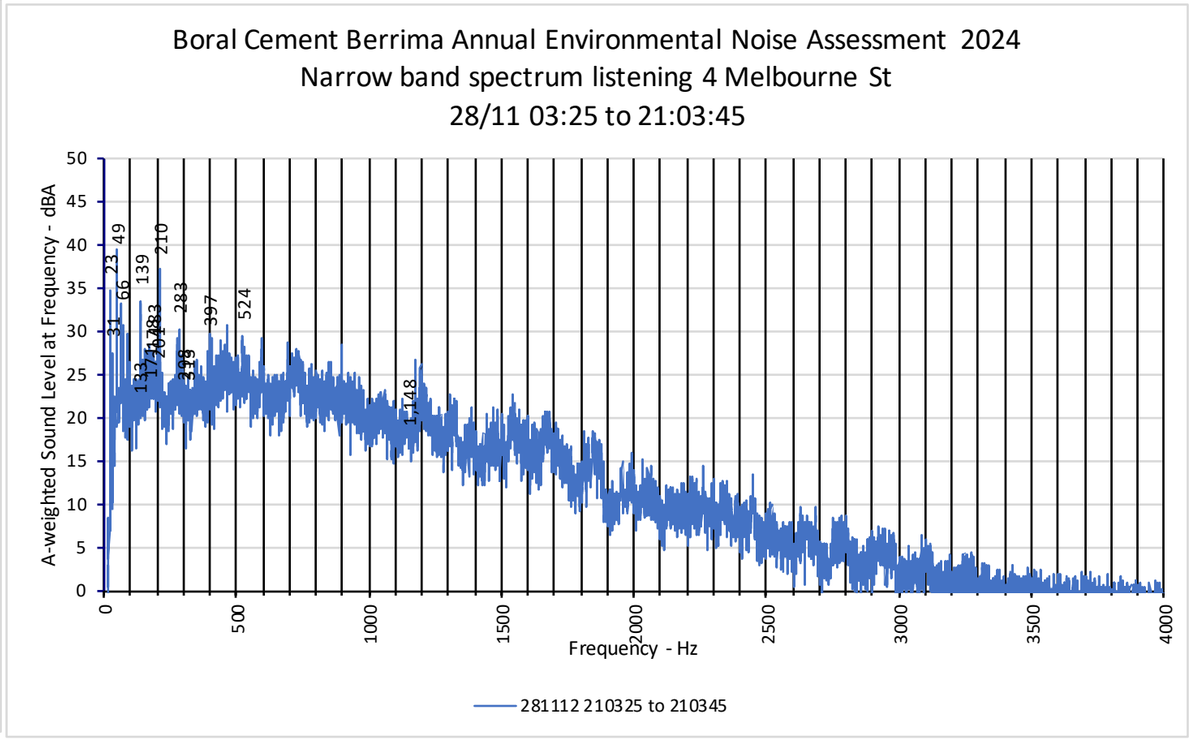


Figure E10: A1



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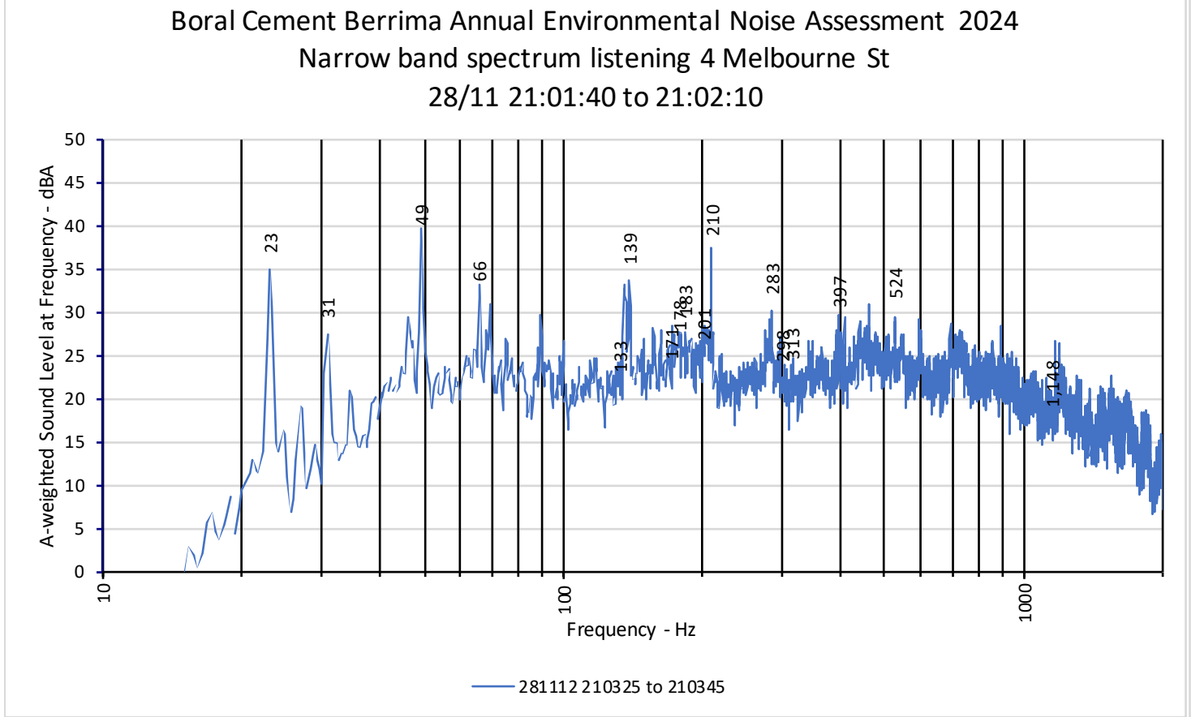

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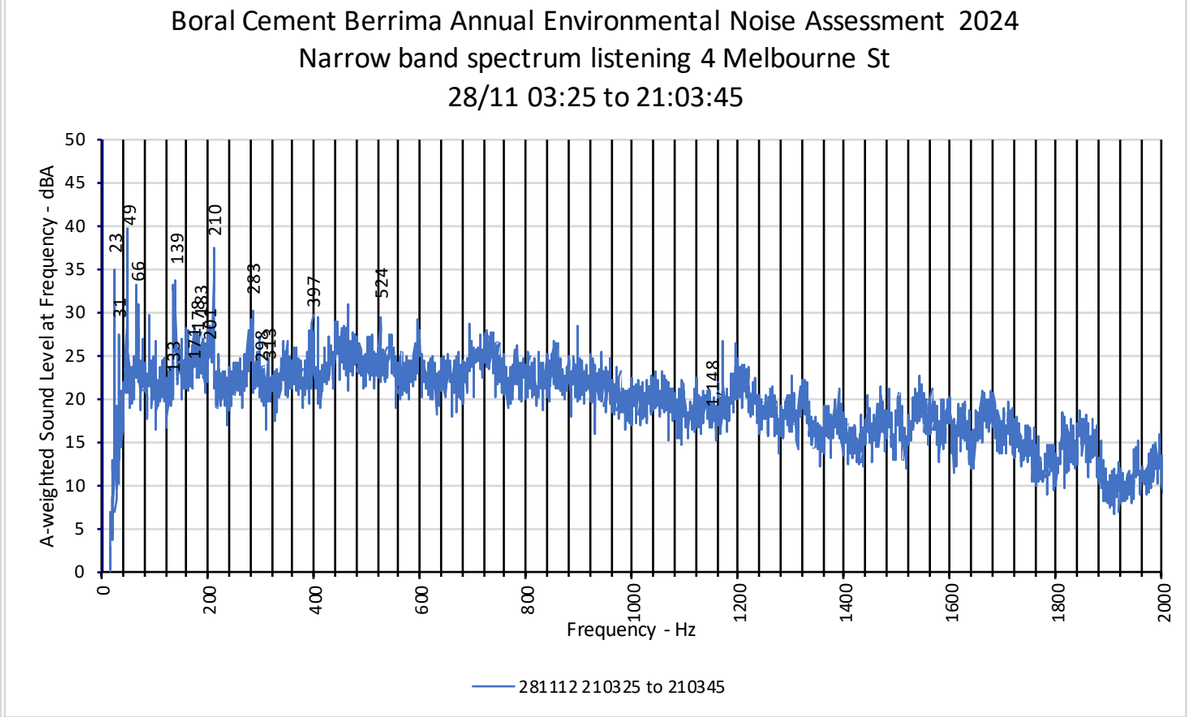

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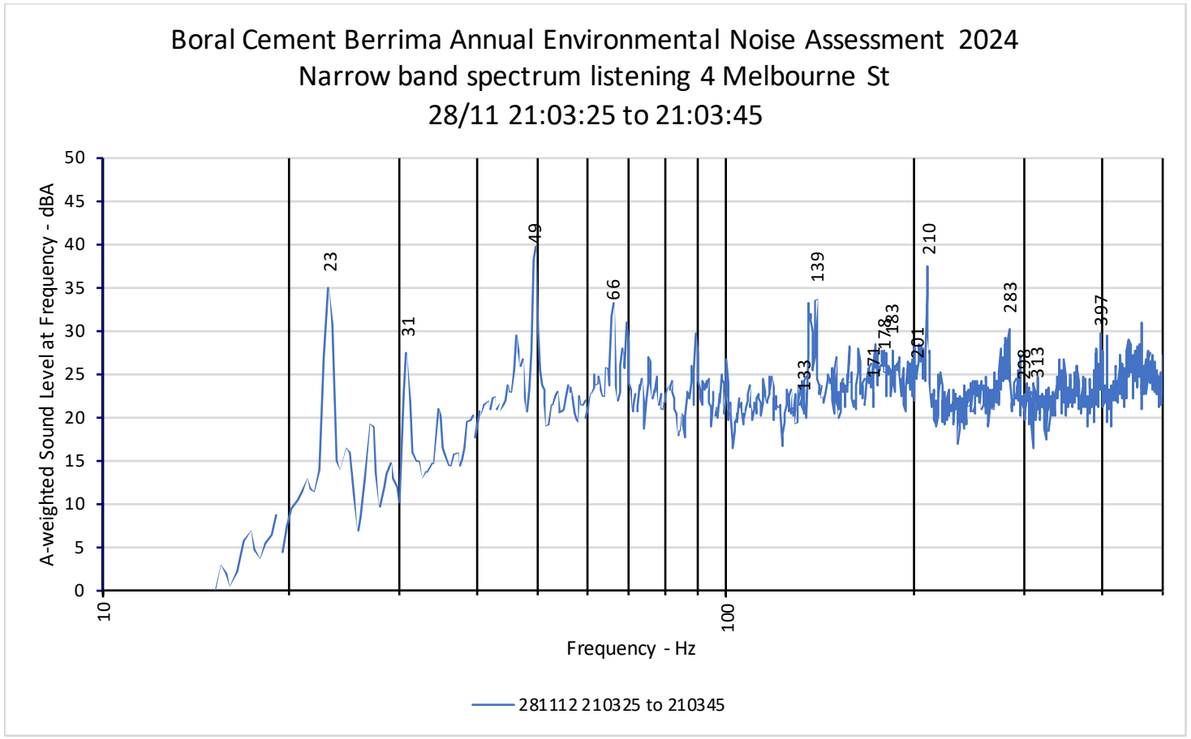
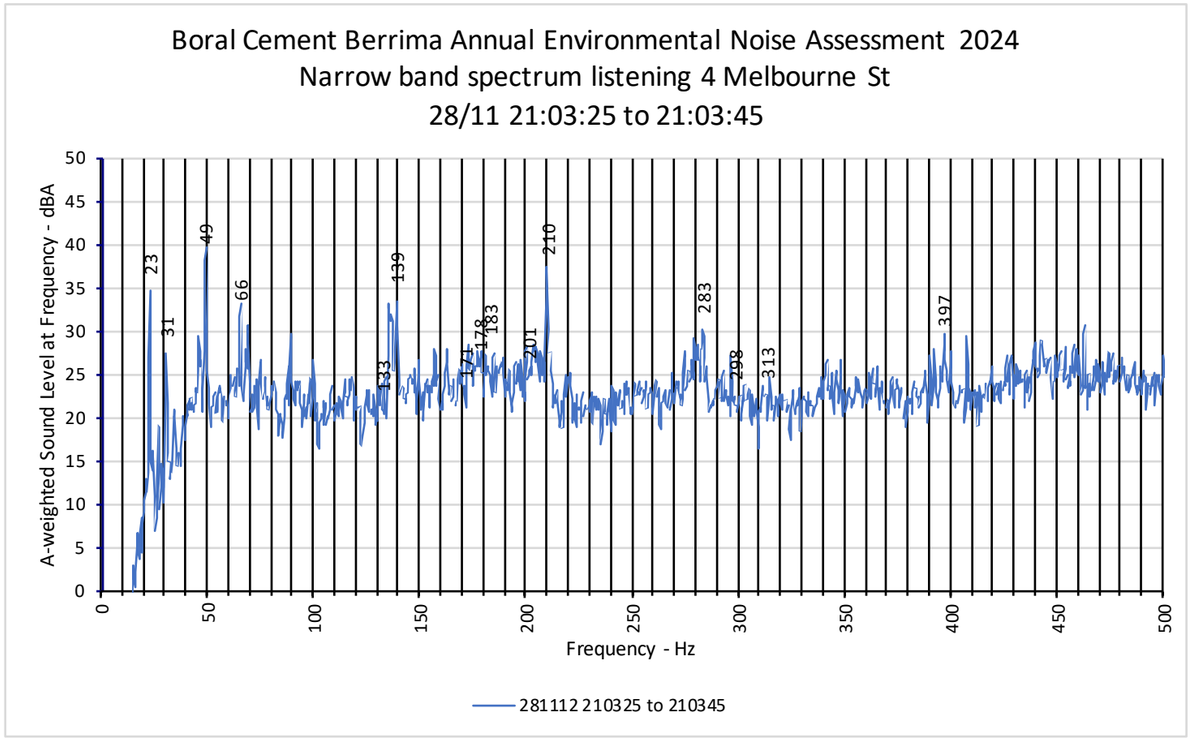


Figure E10: A3



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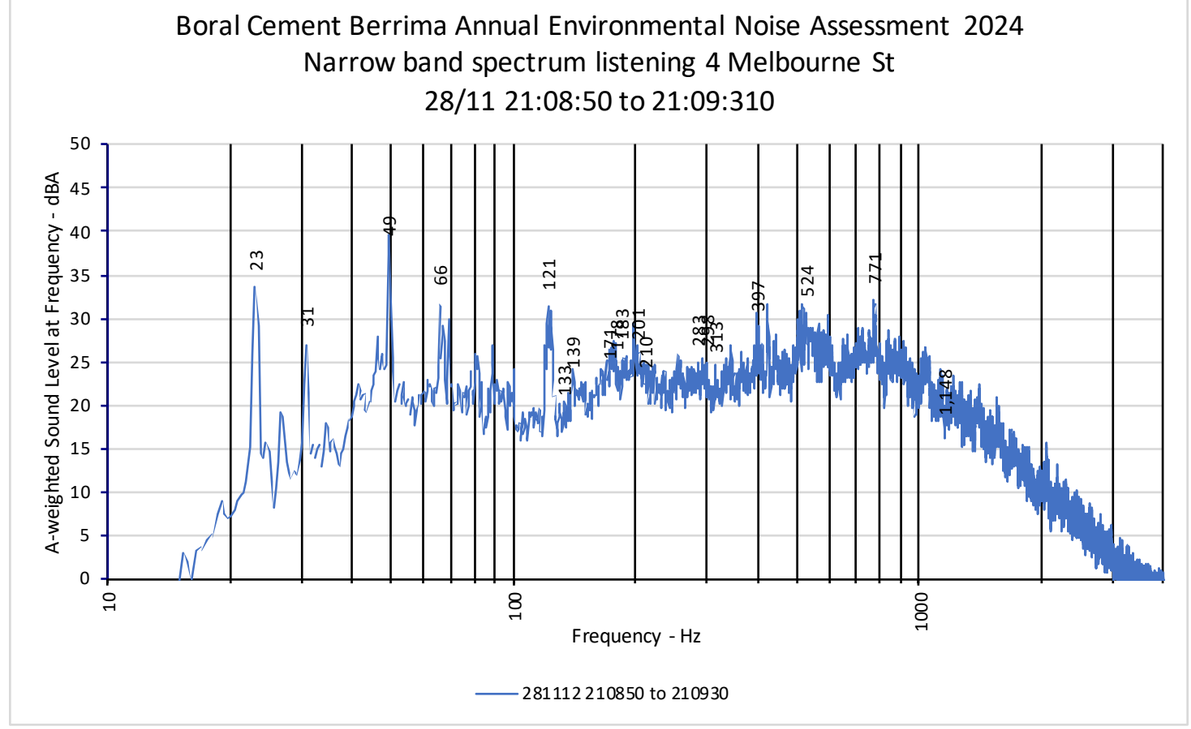
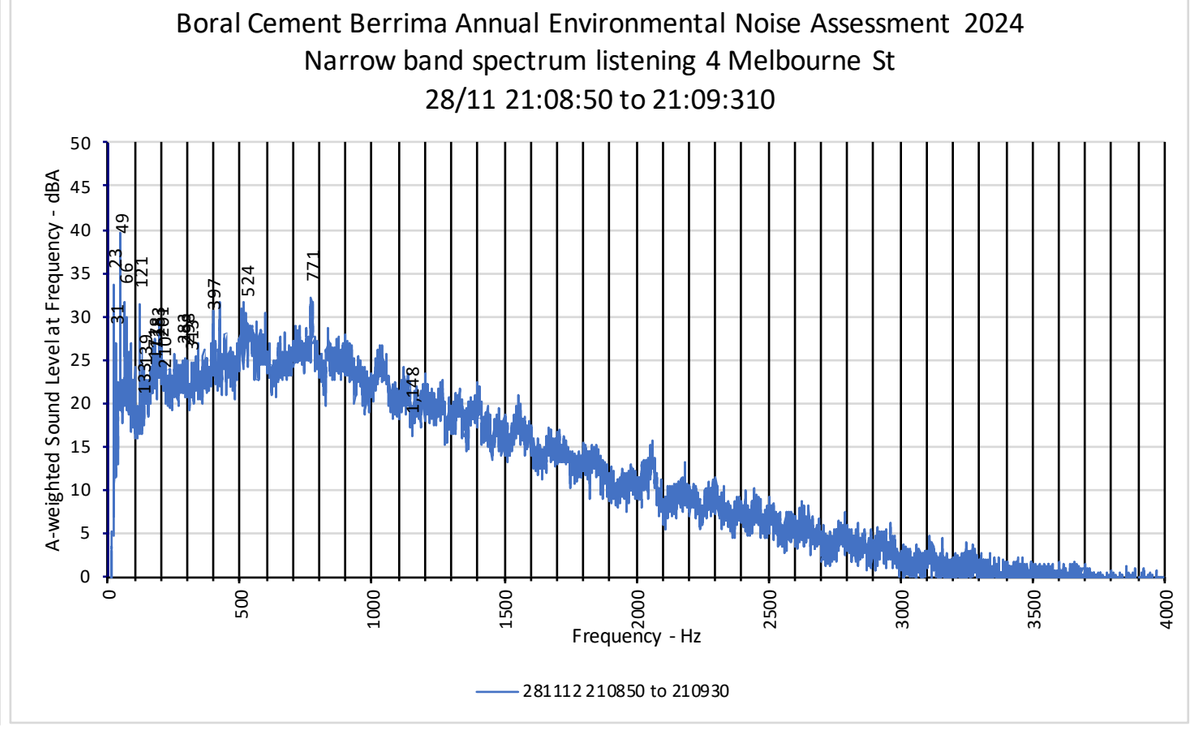


Figure E11: A1



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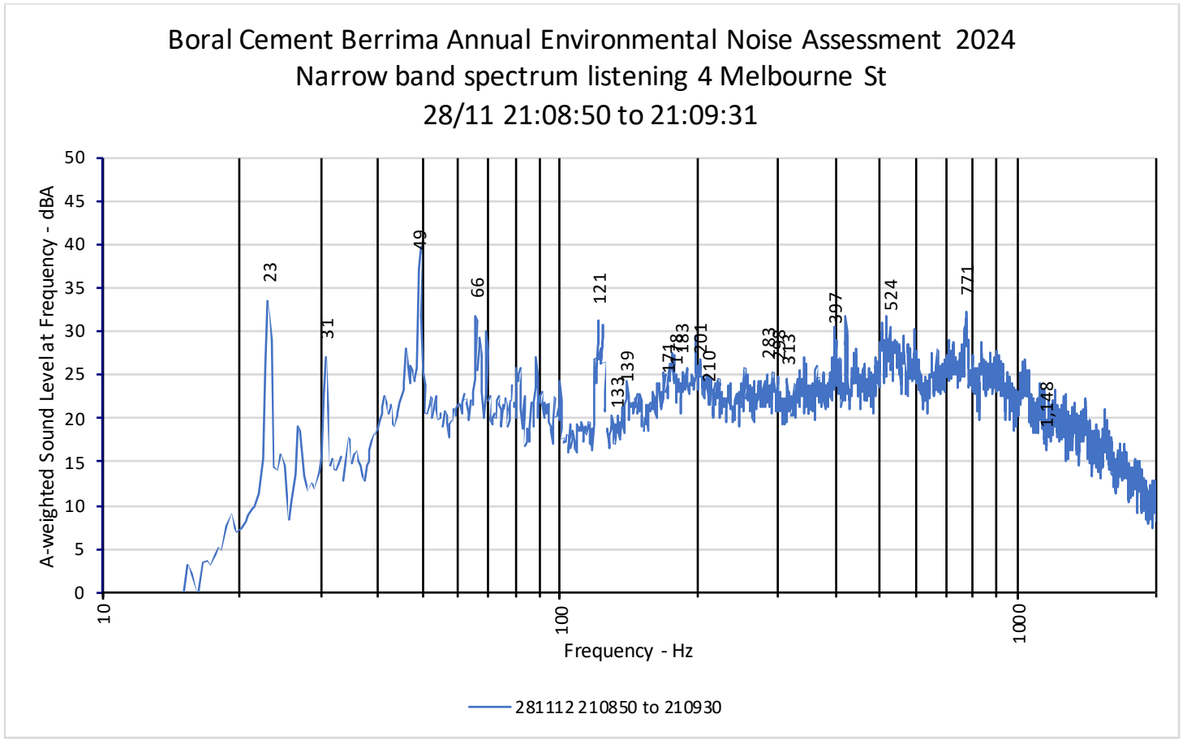
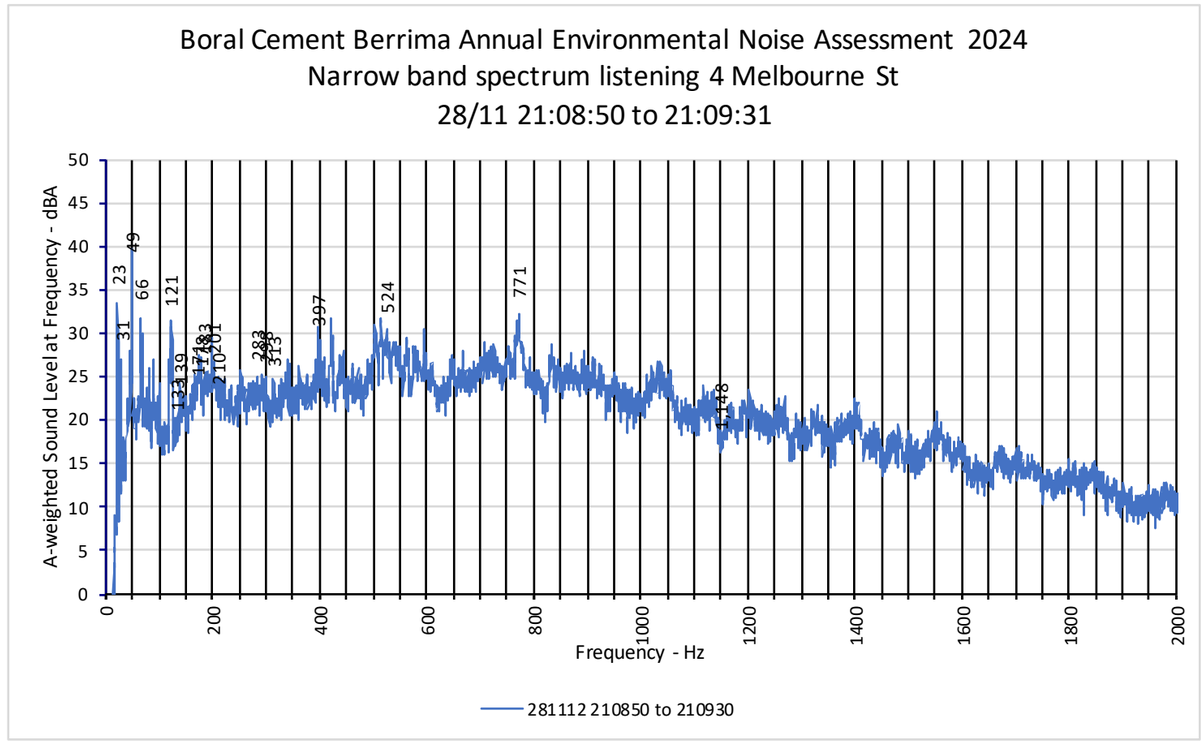


Figure E11: A2



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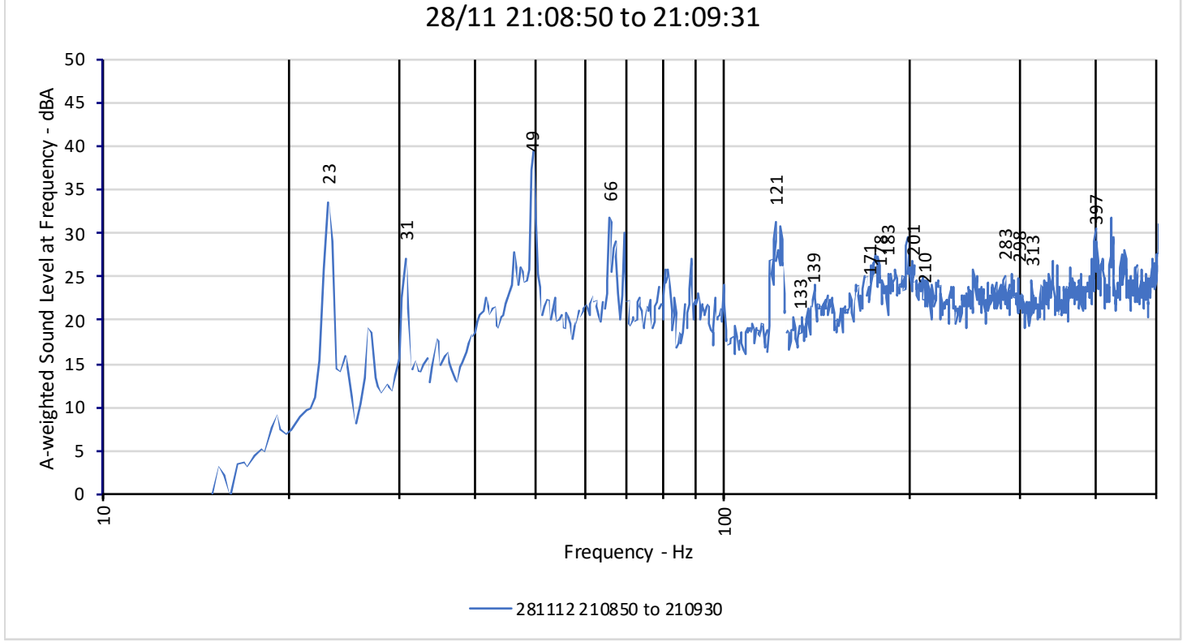


Figure E11: A3

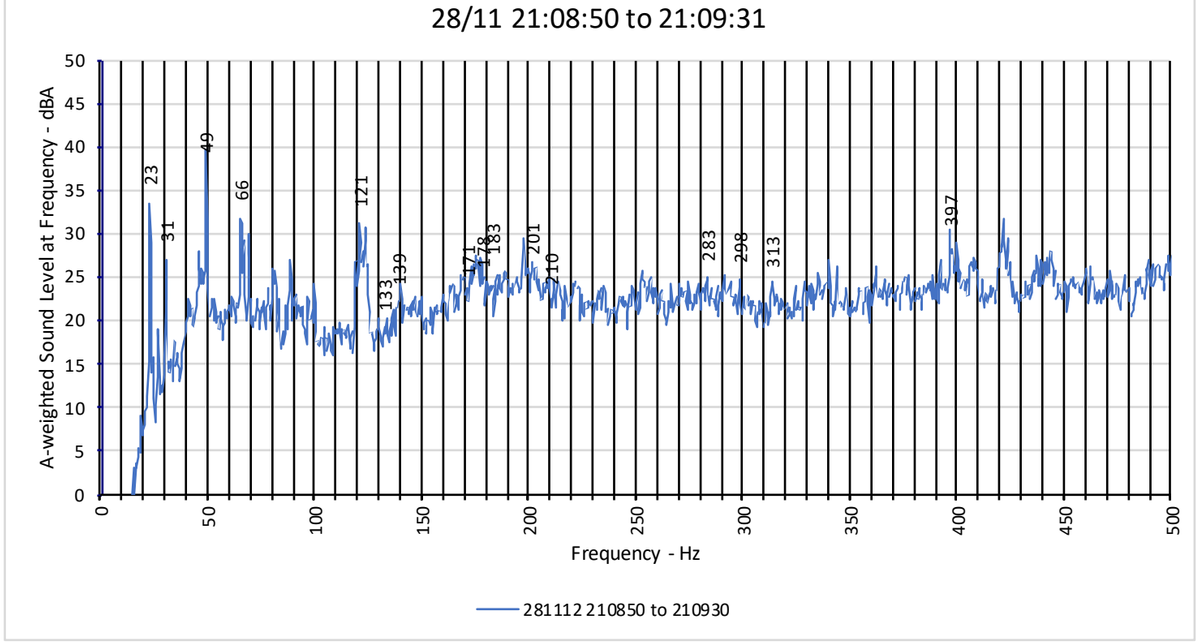


Figure E11: B3

ABN: 25 153 946 064
ACN: 153 946 064

Appendix F: Attended monitoring results

Enviromental Noise Level Assessment Report

for : *Commencing on:*

Berrima Cement Annual Compliance Noise Study - 2024 Wednesday, 27 November 2024

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
Day	4 Melbourne St	Norsonic 140	1	A	900	27/11/2024	12:19 PM	68	44	57	70	13.2	Industry Heard 43-45 surging 48 Car 54-63 - over bump 65 Car Local 65 Truck 56-70 Double Bogie over bump 66
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		29	7	280									
	12 Brisbane St	Norsonic 140	2	A	900	27/11/2024	12:39 PM	67	43	56	68	11.7	Industry Heard 42-43 Highway Noise audible 44 - 45 Car 46-52 - over bump 55 Trucks 51-61 Car Local 48 , 69 , 76 Truck local 78 voice 45 Car door closing 48 Doas barkina distant
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		29	7	280									
	Adelaide St 20m to Taylor level with front of house	Norsonic 140	3	A	900	27/11/2024	12:59 PM	76	48	65	78	13.5	Wind N-NW < 5 km/hr Industry Heard 45-49 Motor Bike 62 Car 60 -72 Trucks 72 - 76 Car Local 48 , 69 , 76 Truck Air barkes 85 gate alarm ~ 48
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		29	7	280									
	Location 20	Norsonic 140	4	A	900	27/11/2024	3:23 PM	63	54	56	69	12.9	Bus 79 - Rattle over bumps very light rain Industry Heard 53-54 Aircraft 57-60 Car 65 Truck Taylor 59 Pneumatic pulse @ SW corner 57
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		23	13	274									

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
Day	North Fence	Norsonic 140	5	A	900	27/11/2024	3:46 PM	58	48	51	66	14.4	Industry Heard 48 49 surging to 55 Traffic Taylor 48 - 52 Mowing in green space paddock 51
		Hourly Average	Temp °C	Wind speed (Km/hr)	Direction degrees								
			23	13	274								
	North Fence	Norsonic 140	57	A	896	6/12/2024	2:00 PM	66	48	53	65	12.0	Ambient 48-52 Crickets 53-69 Truck over bump 53 Truck 52-53 Truck or Thunder 61 Train Horn 53 Birds Kookaburra 59 Aircraft 50-52 Traffic 53
		Hourly Average	Temp °C	Wind speed (Km/hr)	Direction degrees								
			28	0	0								
	4 Melbourne St	Ngara		Ngara	w	900	6/12/2024	2:00 PM	65	45	54	67	13.9	27C, wind calm.Many car passes 54 to 60, truck passes 62 to 71; birds 58, quiet is about 44 between traffic
		Hourly Average	Temp °C	Wind speed (Km/hr)	Direction degrees								
			28	0	0								
	North Fence	Norsonic 140	57	A	897	10/12/2024	2:00 PM	56	50	52	70	17.8	Ambient 50-55 General traffic 54 Truck over bump 55-57 Truck 53-59 Truck air brakes 61 Rail Squeal 58 Birds 54-58 Clang 55
		Hourly Average	Temp °C	Wind speed (Km/hr)	Direction degrees								
			23	1	57								

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
Day	4 Melbourne St	Ngara	Ngara	w	900	10/12/2024	2:00 PM	64	46	54	67	13.5	23C, wind calm. As with other daytime, many car passes 51 to 60, trucks 60 to 70, birds 56, quiet is 44 between traffic
			Hourly Average										
			Temp °C	Wind speed (Km/hr)	Direction degrees								
			23	1	57								
	4 Melbourne St	Rion NA-28	2	A	840	11/12/2024	8:43 AM	67	42	56	69	13.0	Trucks passing on Taylor, 64 to 73, cars 55 to 66, birds 50+, quiet is 40. Main sources trucks, birds, dogs barking
			Hourly Average										
			Temp °C	Wind speed (Km/hr)	Direction degrees								
			1	0	0								
	North Fence	Norsonic 140	41	A	900	11/12/2024	10:17 AM	56	47	50	70	20.1	Calm Conditions - No Wind Industry Heard 48 49 increase breiefly 53-54 Truck Taylor 53 Car Taylor 53 Truck Local 55
			Hourly Average										
			Temp °C	Wind speed (Km/hr)	Direction degrees								
			1	0	0								
	12 Brisbane St	Rion NA-28	5	A	900	11/12/2024	10:17 AM	59	38	47	64	16.9	Noise from LF of blower or plane to N. Quieter here than 4MS - traffic more distant. Passing trucks in Taylor 50 to 54, 60 on bumps, cars in street 60 to 64, birds 45 to 62, train horn 47, cloud cover reducing now 4/8, wind 0 to 1.5m/s N mostly <1
			Hourly Average										
			Temp °C	Wind speed (Km/hr)	Direction degrees								
			1	0	0								

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
Day	Adelaide St 20m to Taylor level with front of house	Rion NA-28	6	A	900	11/12/2024	10:37 AM	74	46	61	73	11.5	Dog barking in houuse low level & to 70. Plant audible, trucks using exhaust brakes down hill to enter plant, birds, truck pass 71 to 78 on bumps. Quiet 46 to 48. Wind calm to <0.5m/s N. 160 & 200 Hz bands at times >10 dB on adjacent.
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		1	0	0									
	Loc 20	Norsonic 140	42	A	900	11/12/2024	11:15 AM	68	54	57	72	15.3	Calm Conditions - No Wind Industry Heard 54 - 55 Truck Taylor 55 Loco 55 Truck Local 76 Bang 56,56 Rail squeal 55 57 Rail movement 56 Birds 55-59
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		1	0	0									
Evening	North Fence	Norsonic 140	85	A	897	28/11/2024	9:00 PM	50	47	48	69	20.6	Ambient 46-49 Truck 49-50 Traffic 48
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		17	1	302									
	4 Melbourne St	Ngara	Ngara	w	900	28/11/2024	9:00 PM	55	36	43	59	16.5	17C, wind NW 0.6m/s. Evening has more vehicle passbys, cars 52 to 59, trucks 46 to 69. Dog barking several times to 52. Fan variation on wind 37 to 39.
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		17	1	302									

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
Evening	North Fence	Norsonic 140	85	A	896	4/12/2024	9:00 PM	54	49	51	69	17.3	Ambient 49-53 Truck 52-55 Traffic 52-57 Alarm 52
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		15	7	43									
	4 Melbourne St	Ngara	Ngara	w	900	4/12/2024	9:00 PM	62	45	50	65	14.6	15C, wind NE 2.5m/s. Mainly car passes 49 to 59, truck 54 and 62, some wind in vegetation to 47 to 51, quiet is 44
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		15	7	43									
	North Fence	Norsonic 140	85	A	897	10/12/2024	9:00 PM	56	51	53	71	17.9	Ambient nise level higher due to Possible rain or activity 51-55 Truck / traffic 56-59 Vechicle Movement / diesel motor 51-56
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		14	7	67									
	4 Melbourne St	Ngara	Ngara	w	900	10/12/2024	9:00 PM	57	47	50	64	14.2	14C, wind ENE 2m/s. More truck passes 59 to 65, cars 55 to 63. Wind in vegetation o 52 and close impacts to 58
		Hourly Average											
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		14	7	67									

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
Night	North Fence	Norsonic 140	1	A	897	28/11/2024	12:00 AM	51	47	48	69	21.3	Industrial noise 46-50 loco 47-51 Diesel motor accerationg 46-50 Heavy vehicle passing 58 Vecicle passing - Taylor 48 -49 Bang 49
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		16	1	135									
	4 Melbourne St	Ngara	Ngara	w	900	28/11/2024	12:00 AM	53	37	41	60	18.9	16C, wind calm. General ambient is low-level industrial noise with occasional fan-noise varying on the wind 40 to 43. Wind in tree noise 40 to 42. Quiet is 36. Passing vehicle to 50. Loco air release 43. Unknown click close to microphone 45
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		16	1	135									
	4 Melbourne St	Ngara	Ngara	w	900	2/12/2024	12:00 AM	55	39	43	62	18.4	15C, wind calm. Slightly higher ambient than on28/11, but similar sources. Quiet is about 37. Car pass 51. Fan variation on wind to 44. Similar unknown close source clicks.
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		15	0	47									
	North Fence	Norsonic 140	1	A	897	2/12/2024	12:00 AM	50	47	48	69	20.5	Industrial noise 46-50 loco 47-51 Diesel motor / reversing Alarm 46-52 Heavy vehicle passing 47-50 Loud noise - 56 Bangs 51 Barking Dog 50 Crickets heard
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		15	0	47									

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
Night	North Fence	Norsonic 140	1	A	897	4/12/2024	12:00 AM	50	46	47	69	21.8	Industrial noise 46-50 loco 46-50 Diesel motor 46-52 Heavy vehicle passing 46-58 Loud noise - 61 Bangs 49-52 Truck Taylor 49-50 Vehicle 49
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		18	7	242									
	4 Melbourne St	Ngara	Ngara	w	900	4/12/2024	12:00 AM	54	39	43	62	18.7	19C, wind WSW 2.5m/s. More truck passing noise than previous nights, 59 to 68, cars 57 to 58, general industriall noise 39 to 44, quiet is 39.
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		18	7	242									
	4 Melbourne St	Ngara	Ngara	w	900	10/12/2024	12:00 AM	57	39	45	60	15.7	14C wind calm. Quiet is about 38, cars pass 54 to 60, truck 62, train loco noise and wagon rolling wheel noise low level, variation of industrial noise 39 to 45, wind in vegetation noise to 46 dBA
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		14	1	149									
	North Fence	Norsonic 140	1	A	897	10/12/2024	12:00 AM	54	48	49	69	20.3	Industrial noise 47-49 Rail squeal 49-58
		Hourly Average											
		Temp °C	*Wind speed (Km/hr)*	*Direction degrees*									
		14	1	149									

Berrima Cement Annual Compliance Noise Study - 2024

Condition	Description	Meter	Ref #	Duration weighting	(secs)	Date	Time	L01	L90	Leq	Lceq	Lceq -Laeq	Comments:
		Instrument :	Serial No	Calibrate Date			Measurement Date :		Pre Cal :		Post Cal :		
		Ngara	878158	24/11/2025									
							28/11/2024			93.9	93.7		
							2/12/2024			93.9	93.7		
							4/12/2024			93.9	93.7		
							6/12/2024			93.9	93.7		
							10/12/2024			93.9	93.7		
		Norsonic 140	1406081	26/06/2025									
							27/11/2024			94	94.2		
							28/11/2024			93.9	93.6		
							2/12/2024			93.9	93.6		
							4/12/2024			93.9	93.6		
							6/12/2024			93.9	93.6		
							10/12/2024			93.9	93.6		
							11/12/2024			94	94.1		
		Rion NA-28	860028	12/12/2025									
							11/12/2024			94	93.8		

Table F1: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Night-time	28/11/24	0:00	1:59	50	Vehicle pass	C
			3:33	42	Wind in vegetation (WIV)	W
			4:40	41	WIV	W
			5:10	41	Distant vehicle?	C
			6:20	41	Fan on wind variation (FOW)	F
			6:40	43	FOW	F
			7:44	41	WIV or electric car	W
			7:53	41	WIV or electric car	W
			8:37	41	Nothing obvious ?	?
			9:08	42	FOW	F
			10:00	41	WIV	W
			10:11	41	WIV	W
			11:36	43	FOW	F
			11:58	41	FOW	F
			12:07	43	Loco air release or WIV	L
			12:57	43	Loco air release	L
			13:10	43	Loco air release	L
			13:46	45	Click close to microphone	?
			14:19	55	Car pass	C
			14:41	56	Truck pass	T

Figure F1: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
28/11/24 0:00 to 0:15 Night-time

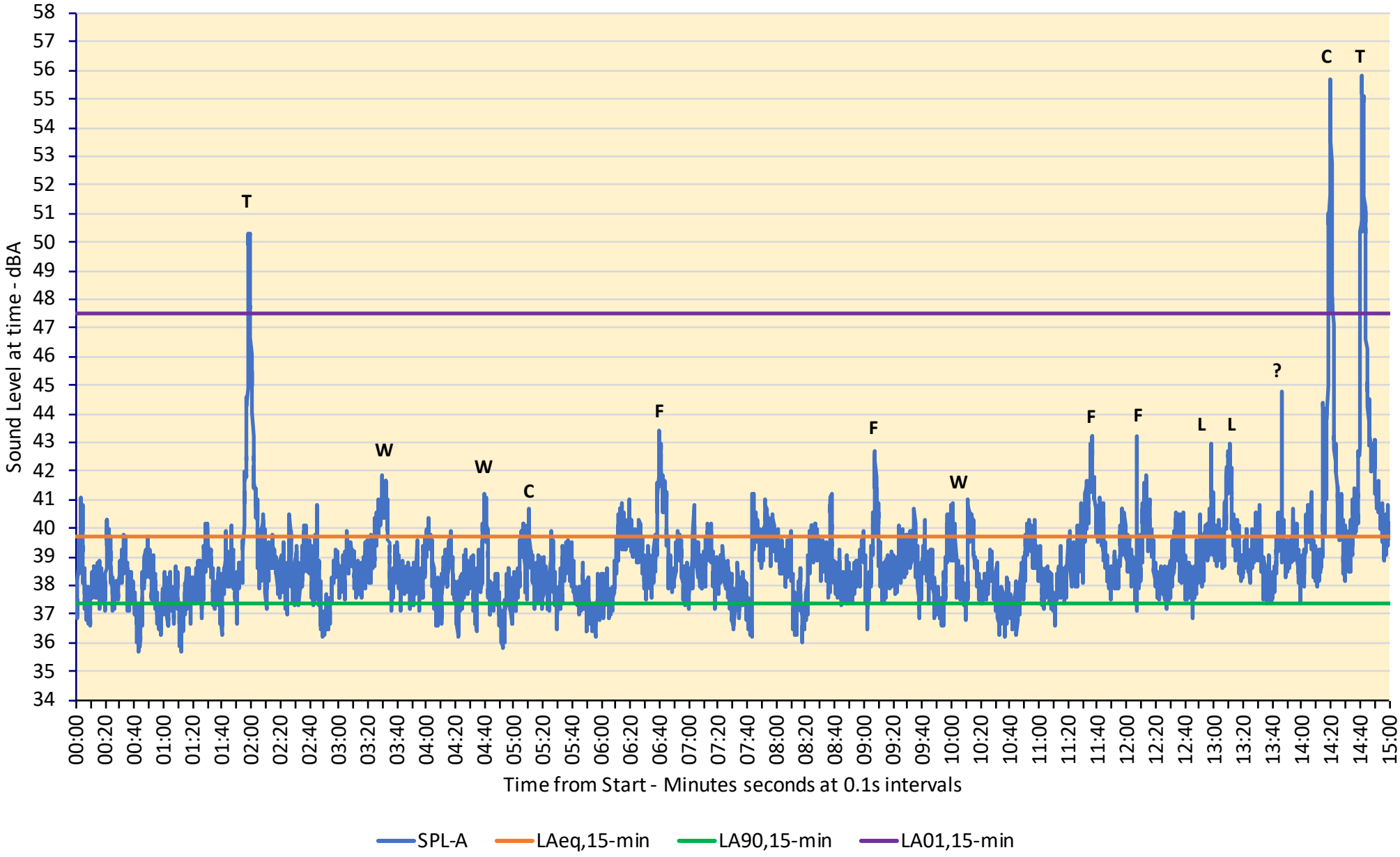


Table F2: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Night-time	2/12/24	0:00	0:32	43	FOW	F
			1:05	43	FOW	F
			1:19	47	Impact somewhere	?
			1:53	47	Nothing obvious	?
			2:12	44	Possibly screw conveyor	SC
			2:41	45	Nothing obvious	?
			3:09	43	FOW	F
			3:45	42	FOW	F
			4:21	44	FOW	F
			4:35	43	FOW	F
			4:46	42	FOW	F
			5:32	51	Car	C
			6:07	43	FOW	F
			7:22	41	FOW	F
			7:36	42	WIV	W
			8:06	42	WIV	W
			8:47	41	WIV	W
			9:05	41	WIV	W
			9:29	42	FOW/SC	F/SC
			9:46	42	FOW/SC	F/SC
			9:49	43	FOW	F
			10:15	43	FOW	F
			10:53	48	FOW	F
			12:11	43	Click close to microphone	?
			13:30-	43 to 44	FOW	F
			14:25	44	Distant Traffic	DT

Figure F2: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
2/12/24 0:00 to 0:15 Night-time

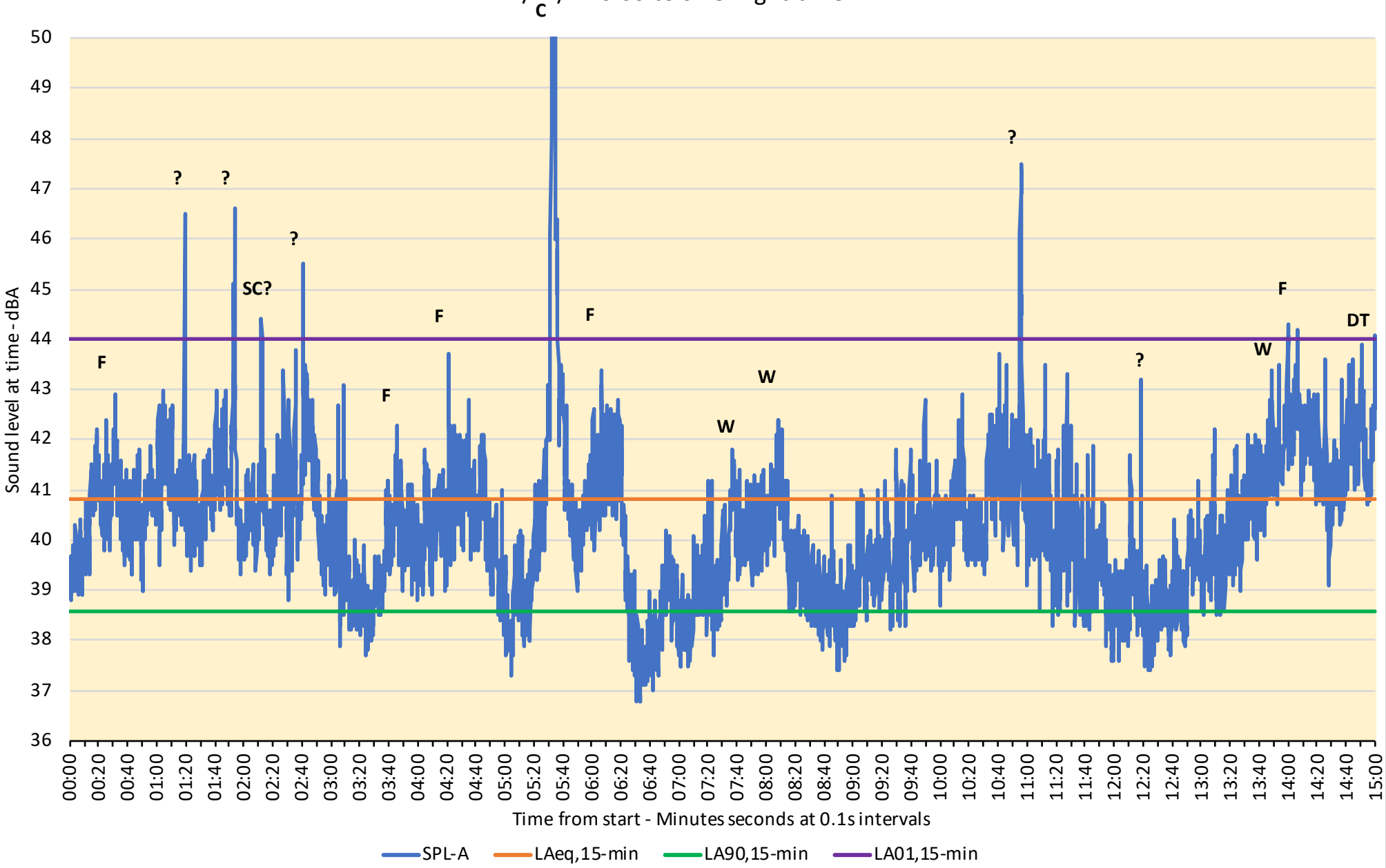


Table F3: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Night-time	4/12/24	0:00	0:30	55	Close impact or similar	?
			0:40-3:20	40 to 45	General broadband industrial r	IN
			1:02	45	Reverse pulse low level	RP
			1:22	46	Screw conveyor low level	SC
			1:55	44	Screw conveyor low level	SC
			2:36	43	WIV	W
			2:46	43	WIV	W
			3:23	45	Close click/wind ?	W?
			3:36	52	Close object impact/wind	W
			5:37	56	Car	C
			5:52	68	Truck	T
			6:50	58	Truck	T
			7:38	55	Truck	T
			7:41	64	Truck	T
			8:02	58	Car	C
			8:03-10:00	41 to 44	Quiet	Q
			9:29	42	WIV	W
			10:04	44	WIV	W
			10:37	61	Truck	T
			10:55	52	Nothing audible	?
			12:43	49	Unknown industrial noise	IN
			14:02	45	Close object impact/wind	W
			14:38	46	Close object impact/wind	W

Figure F3: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
4/12/24 00:00 to 00:15 Night-time

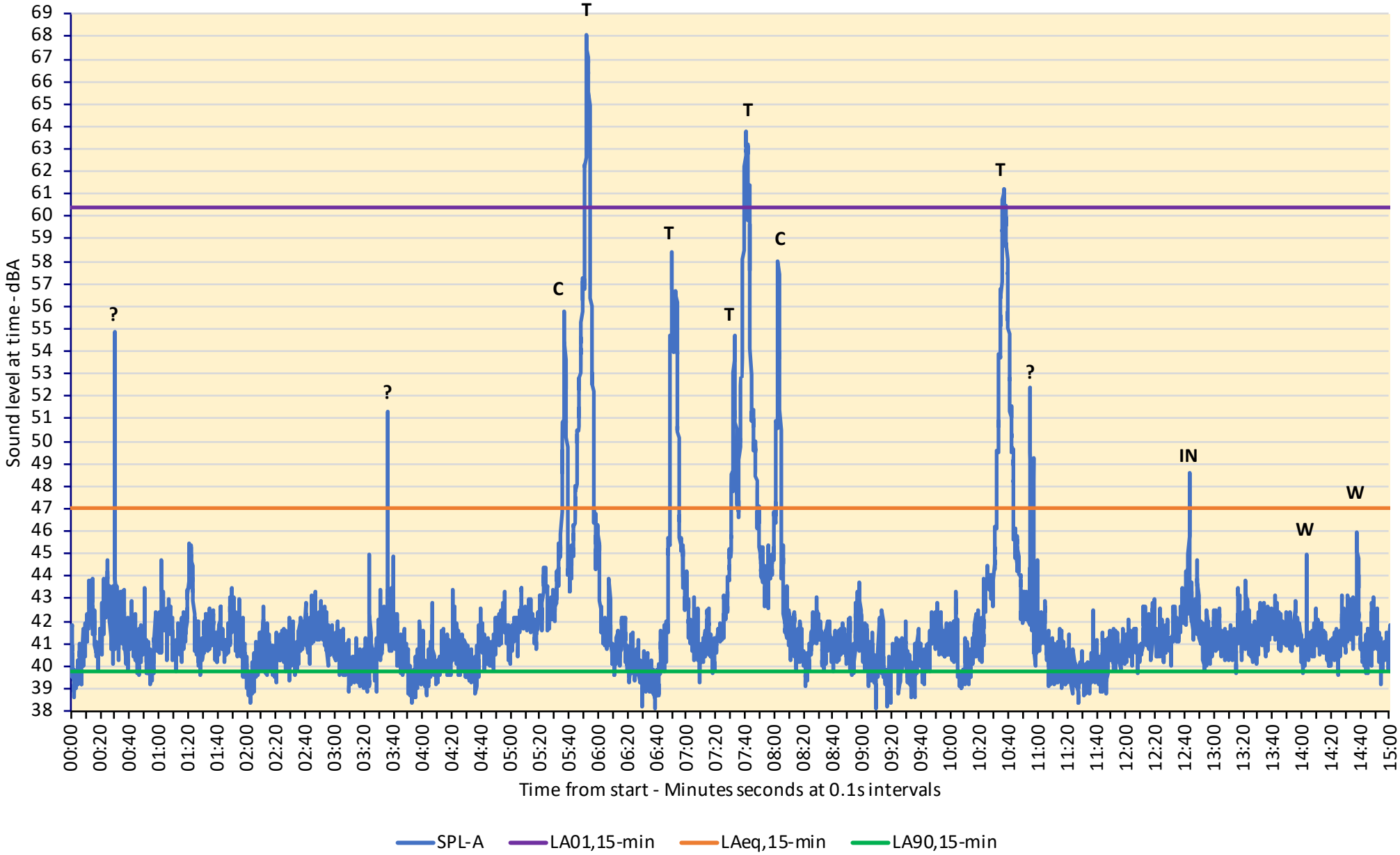


Table F4: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Night-time	#######	0:00	0:37	42	Rail movement low wheel noise	R
			1:58	49	Train Loco horn	L
			2:12-2:44	45 to 48	Rail movement low wheel noise	R
			3:07	60	Car	C
			3:35-4:20	43 to 45	Rail movement low wheel noise	R
			4:25	46	WIV	W
			5:43	45	Air discharge loco	L
			6:45-7:26	43 to 45	WIV	W
			7:51	47	Close impact ?	?
			8:23	54	Car	C
			9:06	46	WIV	W
			10:03	44	Distant loco horn	L
			10:36	46	WIV	W
			11:35	45	WIV	W
			12:22	62	Truck	T
			13:37	47	Nothing specific audible	?

Figure F4: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
10/12/24 0:00 to 0:15 Night-time

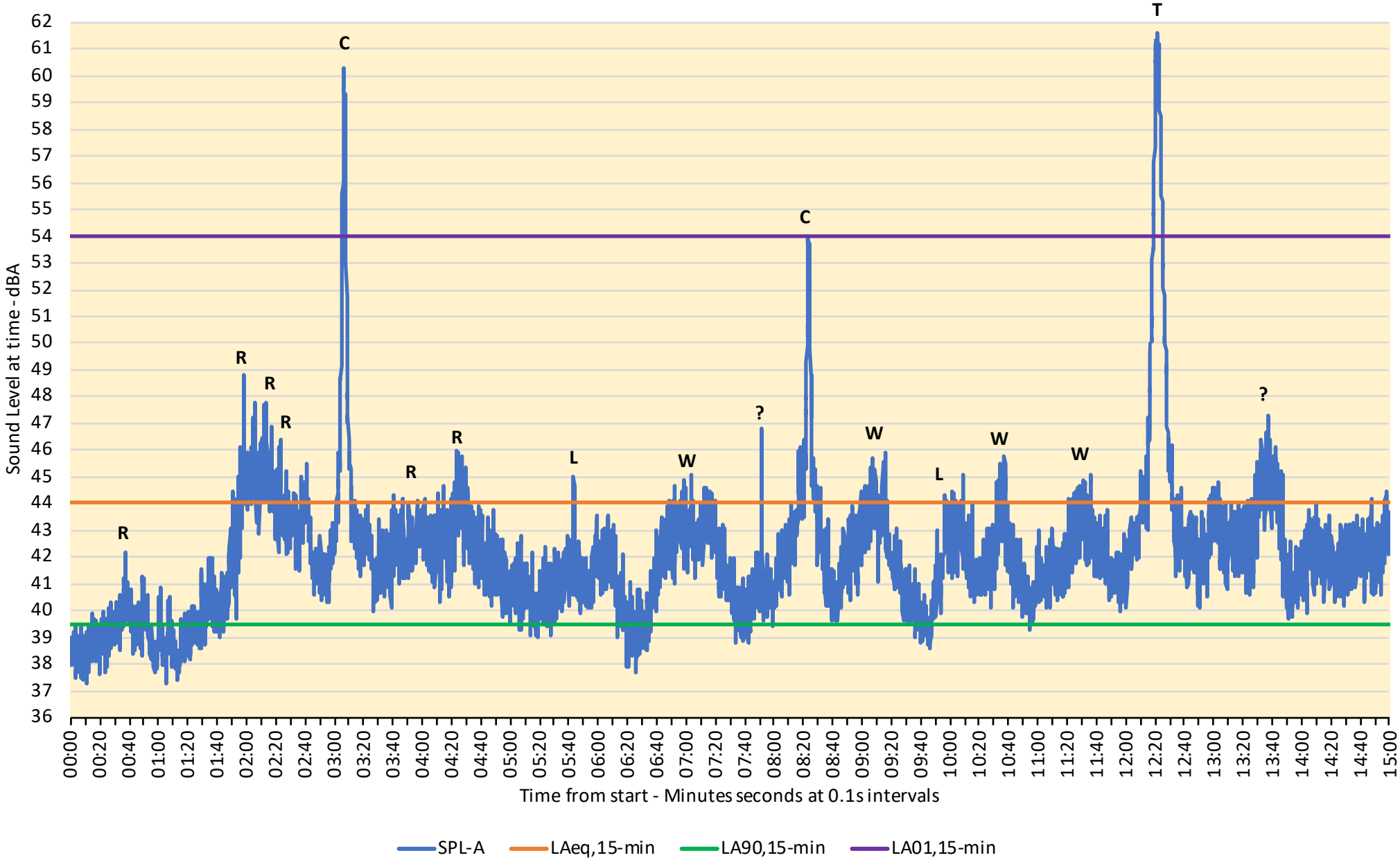


Table F5: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Evening	28/11/24	21:00	0:53	63	Truck	T
			1:38	40	Fan varying on wind	FOW
			2:30	57	Car	C
			3:12	40	WIV	W
			3:52	40	Distant Truck	T
			4:29	52	Truck	T
			5:16	45	Dog barking	D
			5:21	44	Dog barking	D
			5:32	49	Dog barking	D
			5:38	46	Dog barking	D
			5:53	42	Distant rruck	T
			6:17	43	Dog barking	D
			6:22	52	Dog barking	D
			6:25	59	Car	C
			6:48	46	Dog barking	D
			6:51	46	Truck	T
			6:56	57	Dog barking	D
			6:58	69	Truck on bumps	T
			7:03	63	Dog barking	D
			7:38	56	Car	C
			8:09	59	Car	C
			8:31	56	Car	C
			8:43	40	Dog barking	D
			9:28	46	Plane	P
			10:09	42	Plane	P
			10:31	40	Plane	P
			10:50	53	Car	C
			11:20	60	Car	C
			11:59	69	Truck	T
			13:23	55	Car	C
			13:58	52	Car	C
			14:47	42	Dog barking	D
			14:29	48	Dog barking	D
			14:52	50	Dog barking	D

Figure F5: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
28/11/24 21:00 to 21:15 Evening

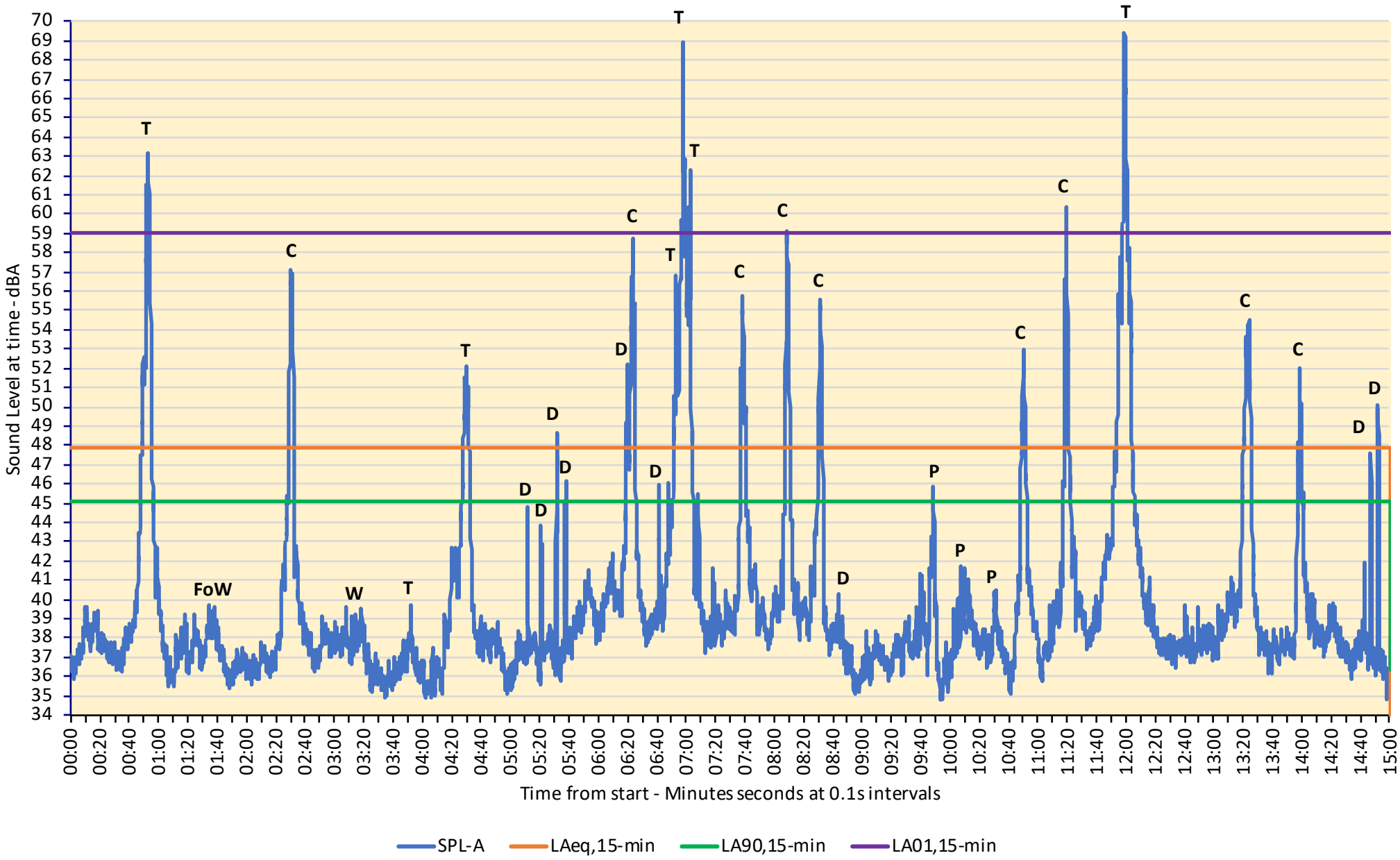


Table F6: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Evening	4/12/24	21:00	0:12-0:36	48 to 50	Broad band industrial noise	I
			1:04	52	Car	C
			1:37	62	Truck	C
			1:58	51	Car	C
			2:31	50	WIV	W
			2:43	59	Car	C
			3:08	49	WIV	W
			4:06	55	Car	C
			4:14	57	Car	C
			4:48	54	Car	C
			5:44	49	WIV	W
			5:47	49	WIV	W
			6:33	54	Car	C
			7:09	58	Car	C
			7:19	54	Car	C
			8:03	59	Car	C
			8:13	51	WIV	W
			9:36	50	Distant traffic, WIV, FOW	C,W, F
			10:09	50	Distant traffic	C
			10:19	59	Car	C
			10:24	56	Car	C
			11:34	50	Unrecognisable source	?
			11:58	51	FOW	F
			12:29	54	Car	C
			12:49	49	Car	C
			12:58	52	Car & Dog	C,D
			13:18	57	Car	C
			13:46	53	Car	C
			13:55	50	Car	C
			14:27	53	Truck	T
			14:41	50	Car	C

Figure F6: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
4/12/24 21:00 to 21:15 Evening

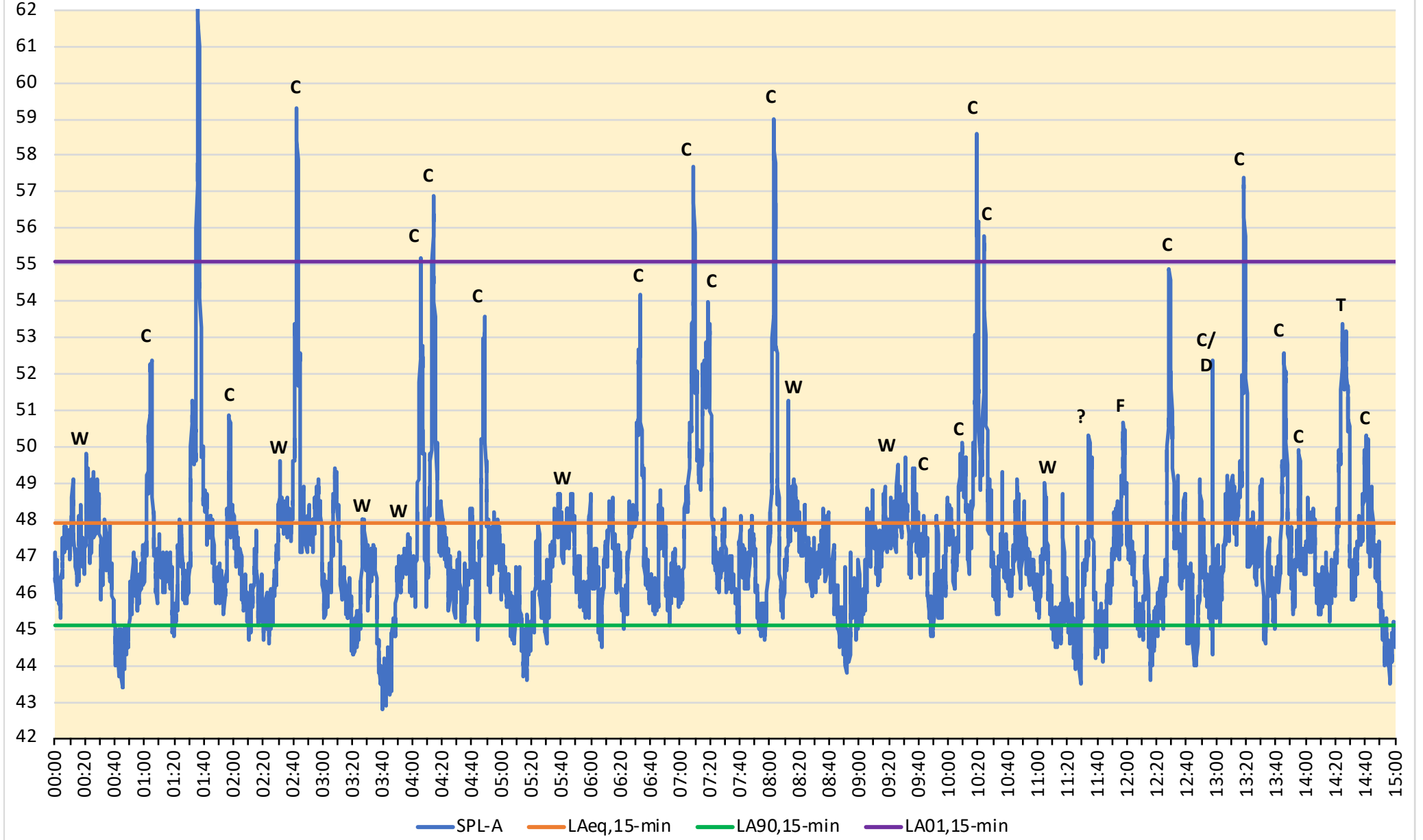


Table F7: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Evening	10/12/24	21:00	0:14	63	Car	C
			0:29	50	WIV	W
			0:52	60	Car	C
			1:14	51	WIV	W
			1:39	52	Distant traffic	C
			1:54	56	Car	C
			2:52	56	Car	C
			3:06	59	Truck	T
			3:33	52	WIV	W
			4:08	50	WIV	W
			4:29	62	Car	C
			5:03	55	Car	C
			5:41	50	WIV	W
			6:24	50	Truck	T
			7:13	57	Car	C
			7:59	52	Close impact	?
			8:06	57	Close impact	?
			8:33	55	Car	C
			8:56	52	Close impact	?
			9:32	63	Truck	T
			9:42	66	Truck	T
			9:47	66	Truck	T
			11:28	57	Car	C
			13:34	61	Truck	T
			14:07	56	Car	C
			14:16	60	Car	C

Figure F7: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
10/12/24 21:00 to 21:15 Evening

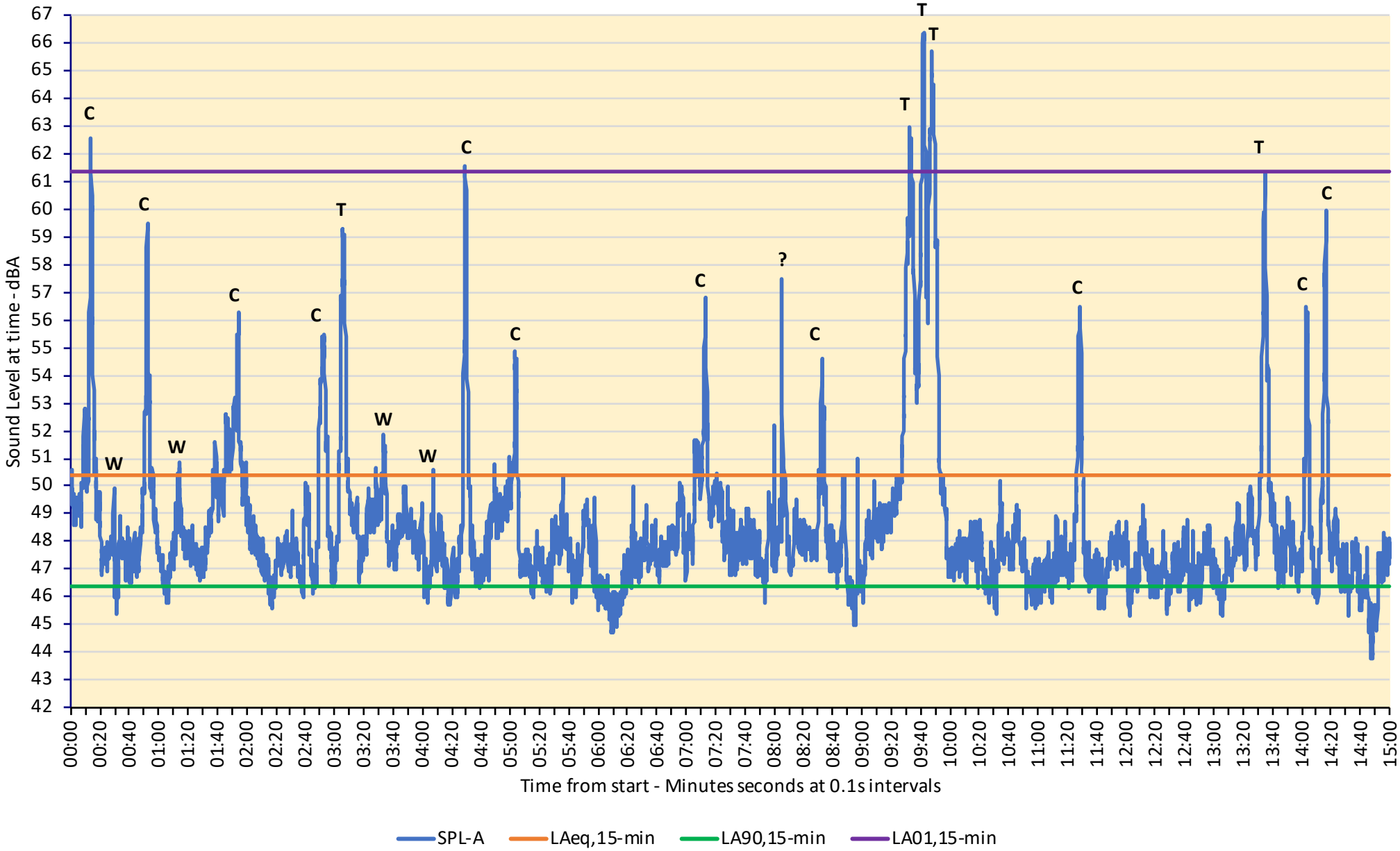


Table F8: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol		Time	Event Level	Source Origin?	Symbol
Daytime	6/12/24	14:00	0:11	59	Car	C		9:35	49	Bird	B
			0:31	58	Car	C		9:41	52	Bird	B
			0:35	59	Car	C		9:45	54	Car	C
			0:52	56	Car	C		9:52	49	Bird	B
			1:29	63	Truck	T		10:01	56	Car	C
			1:31	67	Truck	T		10:16	63	Truck	T
			2:23	58	Car	C		10:19	55	Bird	B
			3:09	64	Truck	T		10:32	58	Car	C
			3:27	66	Truck	T		10:47	55	Bird	B
			3:30	68	Truck	T		11:09	56	Car	C
			3:52	57	Car	C		11:18	51	Bird	B
			4:13	57	Bird	B		11:22	56	Car	C
			4:22	57	Car	C		11:33	52	Bird	B
			4:26	71	Truck	T		11:36	63	Truck	T
			4:39	57	Car	C		11:50	60	Car	C
			4:46	52	Truck	T		11:54	57	Car	C
			4:58	48	Distant Truck	T		12:14	59	Car	C
			5:15	57	Car	C		12:22	57	Car	C
			5:23	57	Car	C		12:40	47	Bird	B
			5:41	60	Car in street	C		12:53	64	Truck	T
			6:09	60	Car	C		13:00	58	Car	C
			6:25	50	Distant Truck	T		13:03	58	Car	C
			7:02	55	Car	C		13:05	57	Car	C
			7:27	64	Truck	T		13:18	53	Car & Bird	C,B
			7:56	70	Truck	T		13:30	62	Truck	T
			8:09	69	Truck	T		13:50	58	Car	C
			8:28	56	Car	C		13:58	61	Truck	T
			8:29	58	Car	C		14:16	58	Car	C
			8:43	57	Car	C		14:25	53	Car	C
			9:00	52	Bird	B		14:35	53	Car	C
			9:09	56	Car	C		14:38	65	Truck	T
			9:17	56	Car	C		14:54	53	Truck	T
			9:21	57	Car	C					

2024 listening time history graphs.xlsx

Figure F8: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
6/12/24 14:00 to 14:15 Daytime

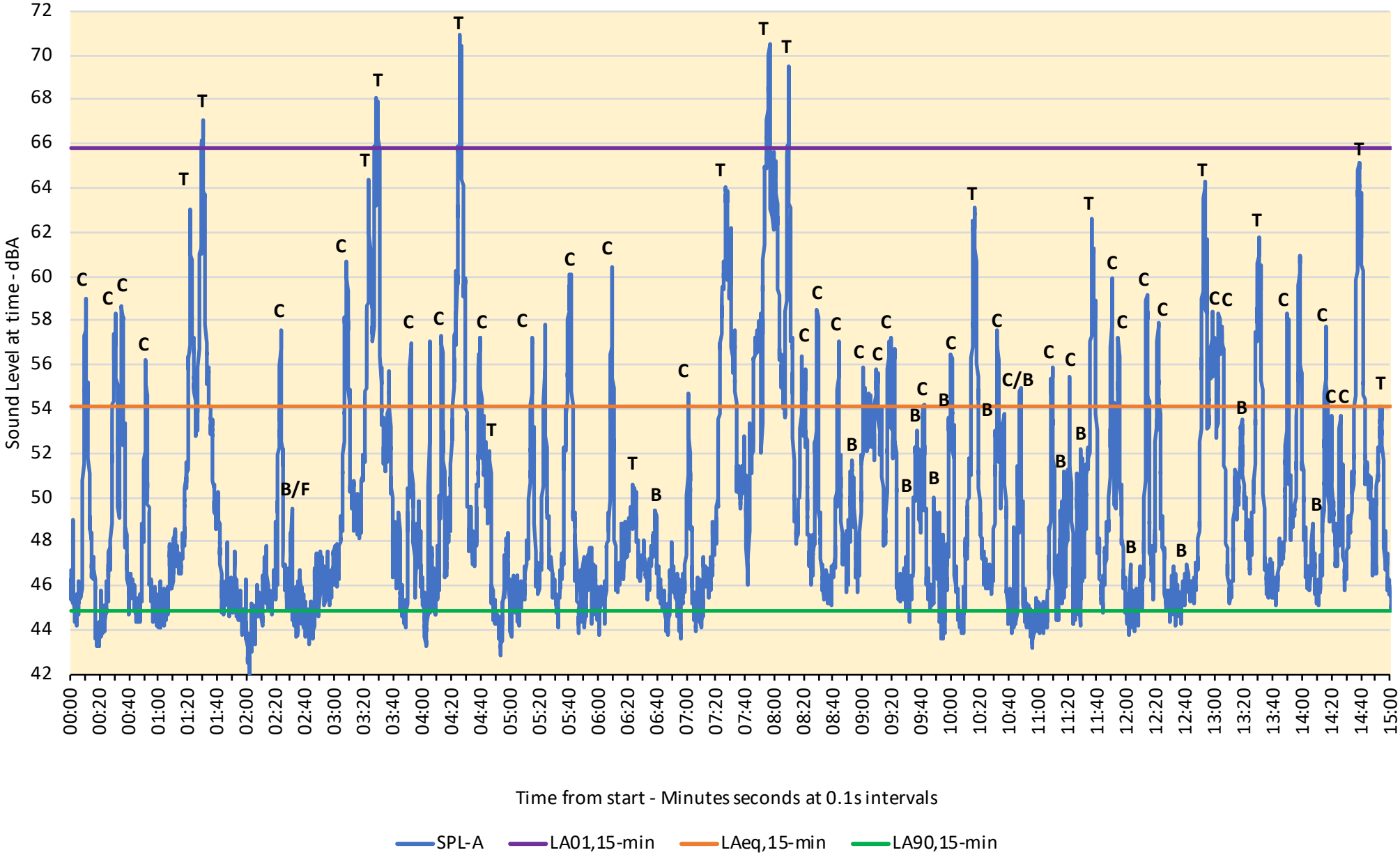


Table F9: Boral Cement Berrima Annual Environmental Noise - Listening Time history events

Period	Date	Time Start	Time	Event Level	Source Origin?	Symbol
Daytime	10/12/24	14:00	0:27	51	Car	C
			0:53	55	Car	C
			0:56	67	Truck	T
			1:22	57	Car	C
			1:32	64	Truck	T
			1:45	57	Car	C
			2:09	60	Car	C
			2:36	56	Car	C
			3:14	70	Truck	T
			3:22	56	Car	C
			3:24	61	Car	C
			3:47	66	Truck	T
			4:09	56	Car	C
			4:23	58	Car	C
			5:10	54	Car	C
			5:24	64	Truck	T
			5:37	49	Bird	B
			5:56	54	Car	C
			6:08	55	Car	C
			6:32	56	Car	C
			6:38	54	Car	C
			6:47	53	Truck	T
			7:04	59	Truck	T
			7:06	66	Truck	T
			7:11	60	Car	C
			7:21	59	Car	C
			8:09	68	Truck	T
			8:17	68	Truck	T
			8:22	59	Car	C
			8:35	52	Bird	B
			8:46	56	Car	C
			8:55	50	WIV	W
			9:04	58	Car	C
			9:09	54	Car	C
			9:47	58	Car	C
			10:05	55	Car	C
			10:09	54	Car	C
			10:12	53	Car	C
			10:32	54	Car	C
			10:38	55	Car	C
			10:42	53	Car	C
			10:46	54	Car	C
			10:57	50	Car	C
			11:10	49	Bird	B
			11:32	51	Bird	B
			11:35	62	Truck	T
			11:41	58	Truck	T
			11:47	58	Car	C
			11:56	51	Bird	B
			12:00	55	Car	C
			12:16	53	Bird	B
			12:23	55	Truck	T
			12:24	65	Truck	T
			12:29	57	Car	C
			12:37	58	Car	C
			12:52	58	Car	C
			13:00	56	Car & Bird	C,B
			13:07	61	Car	C
			13:10	58	Bird	B
			13:17	55	Bird	B
			13:22	53	Bird	B
			13:31	58	Bird	B
			13:42	58	Bird	B
			13:49	60	Bird	B
			13:50	62	Car	C
			13:56	60	Bird	B
			14:04	64	Truck	T
			14:06	64	Truck	T
			14:24	54	Bird	B
			14:29	55	Car	C
			14:42	55	Bird	B
			14:44	56	Car	C
			14:56	56	Car	C

2024 listening time history graphs.xlsx

Figure F9: Boral Cement Berrrima Annual Environmental Noise Assessment - 4 Melbourne St Listening
10/12/24 14:00 to 14:15 Daytime

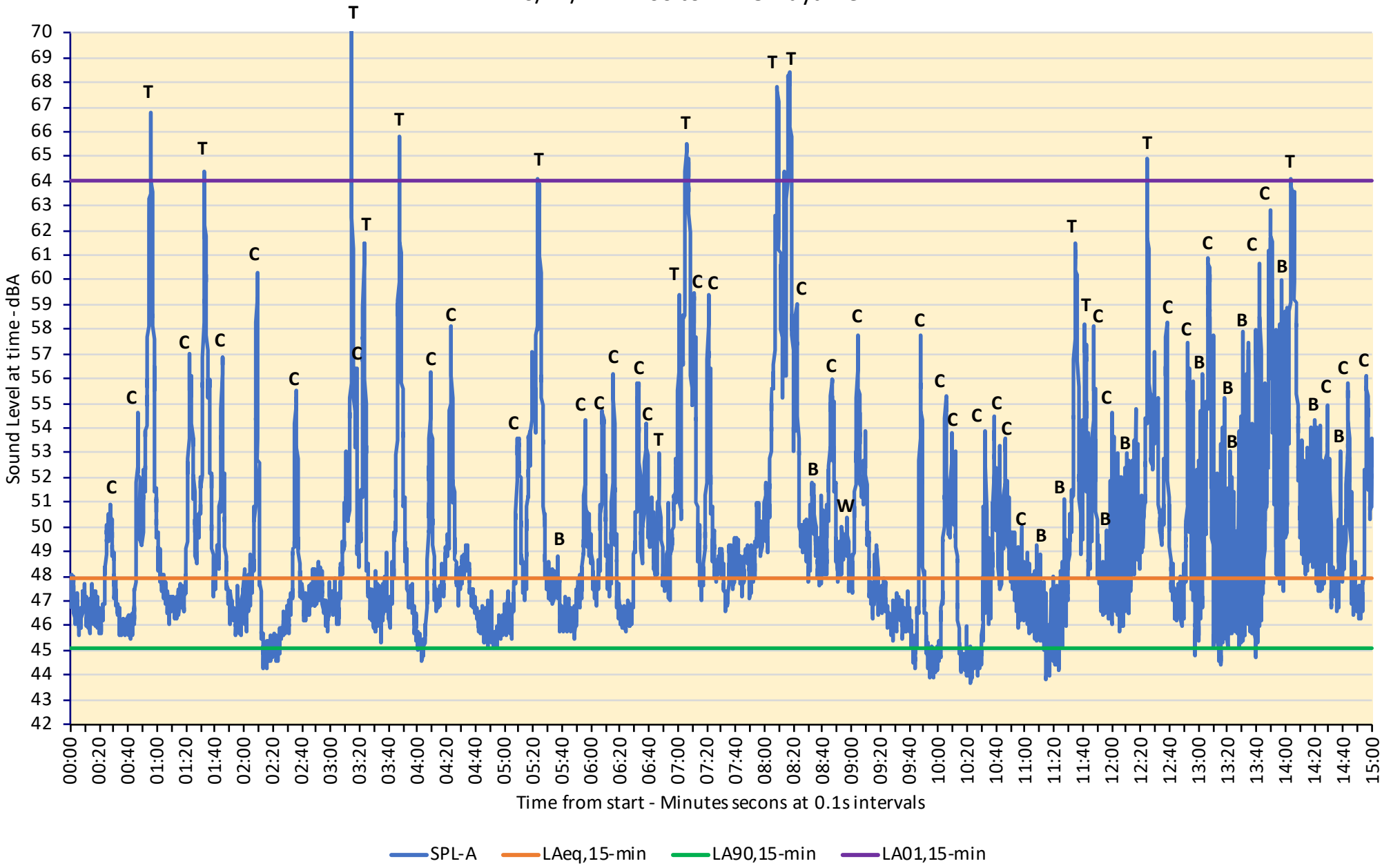


Figure F10: North Fence Attended Monitoring - Night Time 28 Nov 24

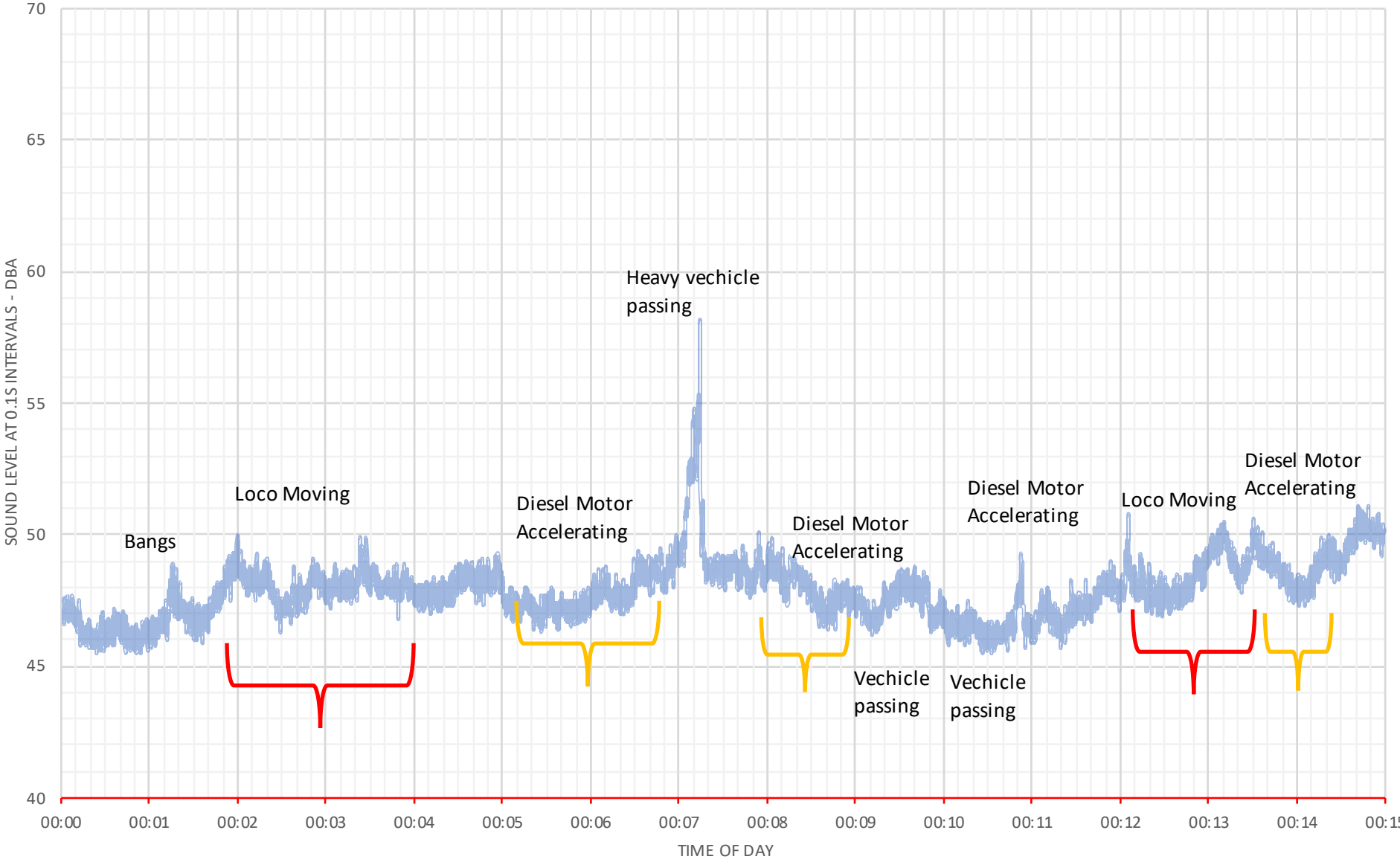


Figure F11: North Fence Attended Monitoring- Night Time 2 Dec 24

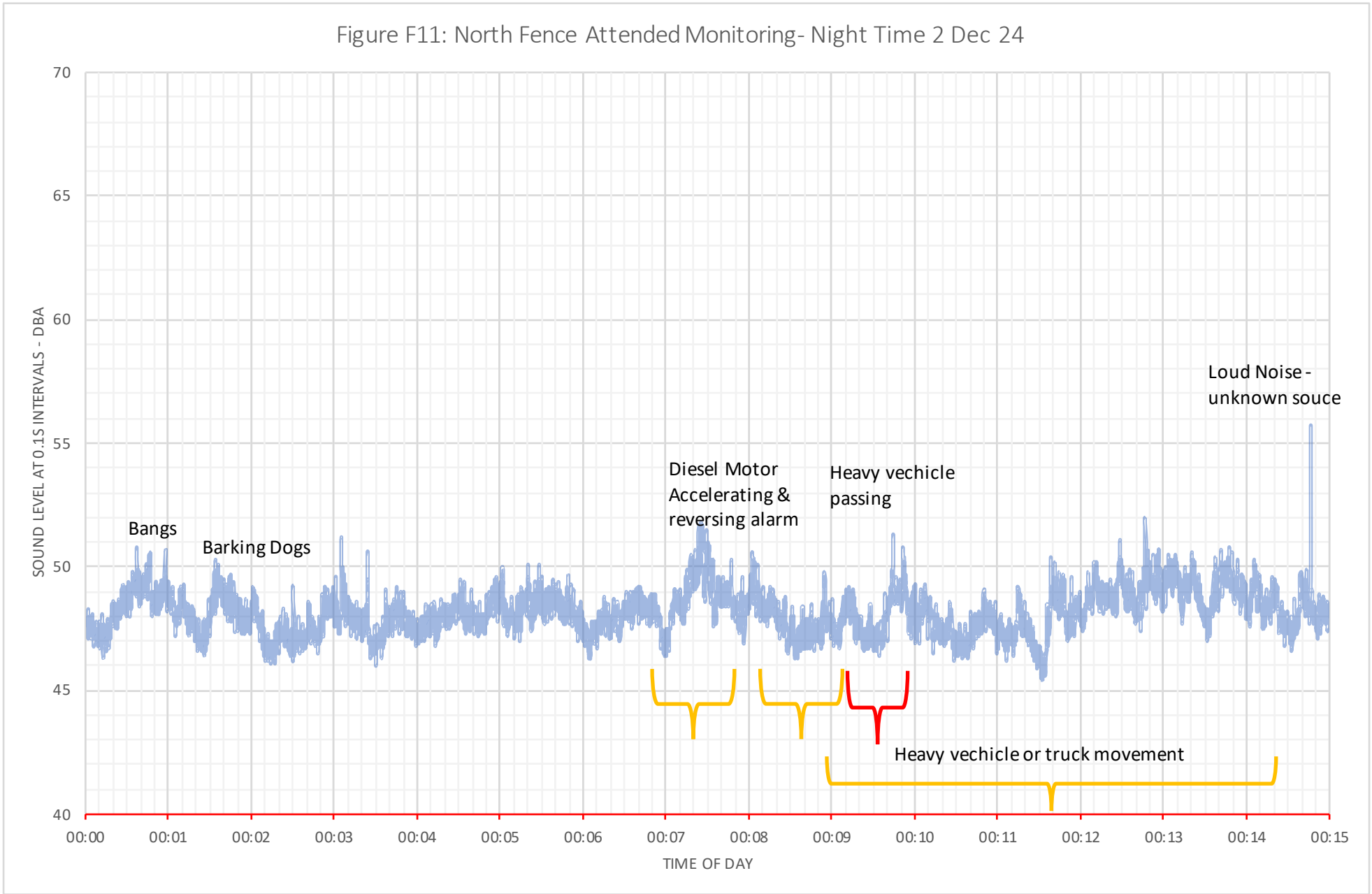


Figure F12: North Fence Attended Monitoring- Night Time 4 Dec 24

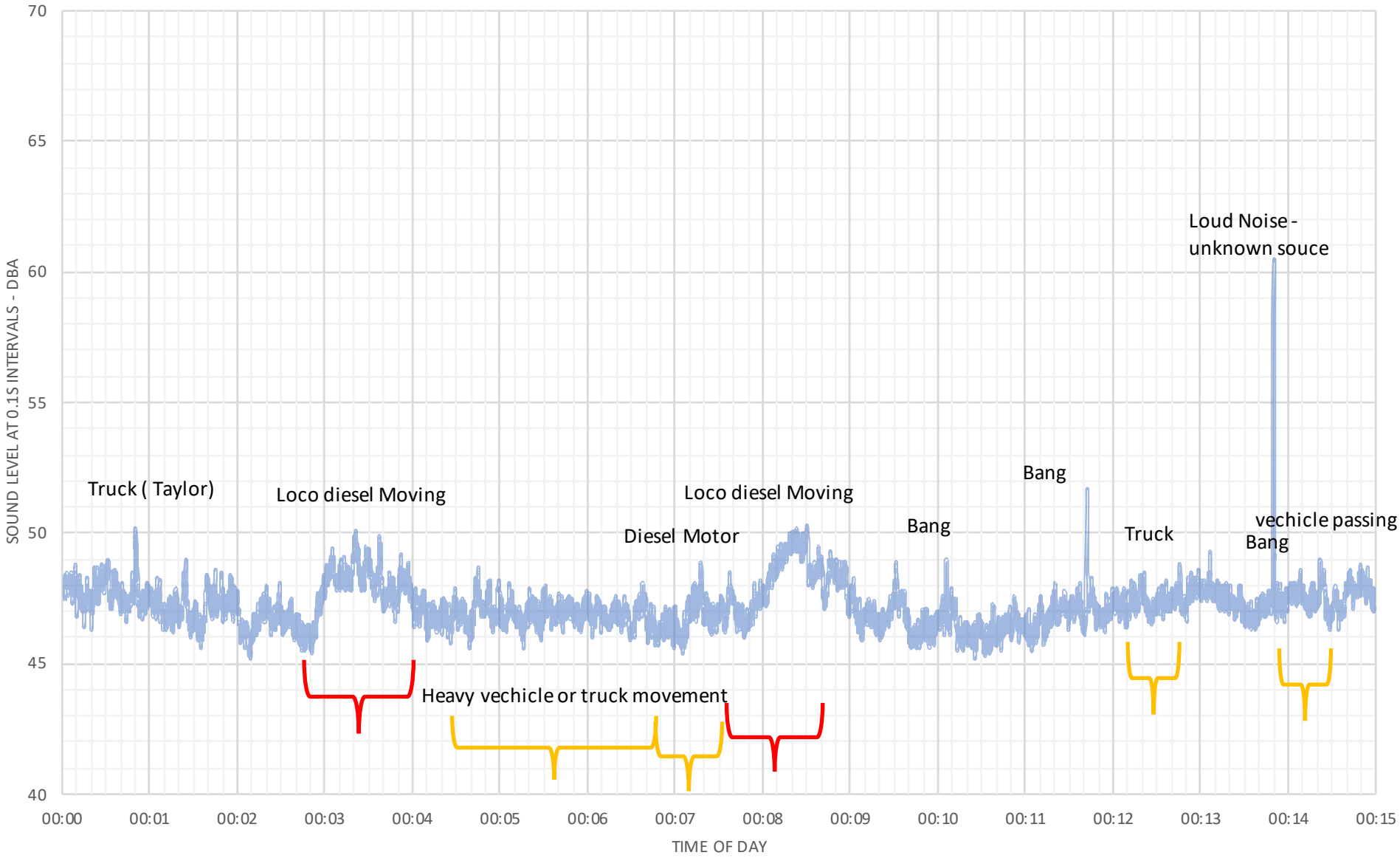


Figure F13: North Fence Attended Monitoring - Night Time 10 Dec 24

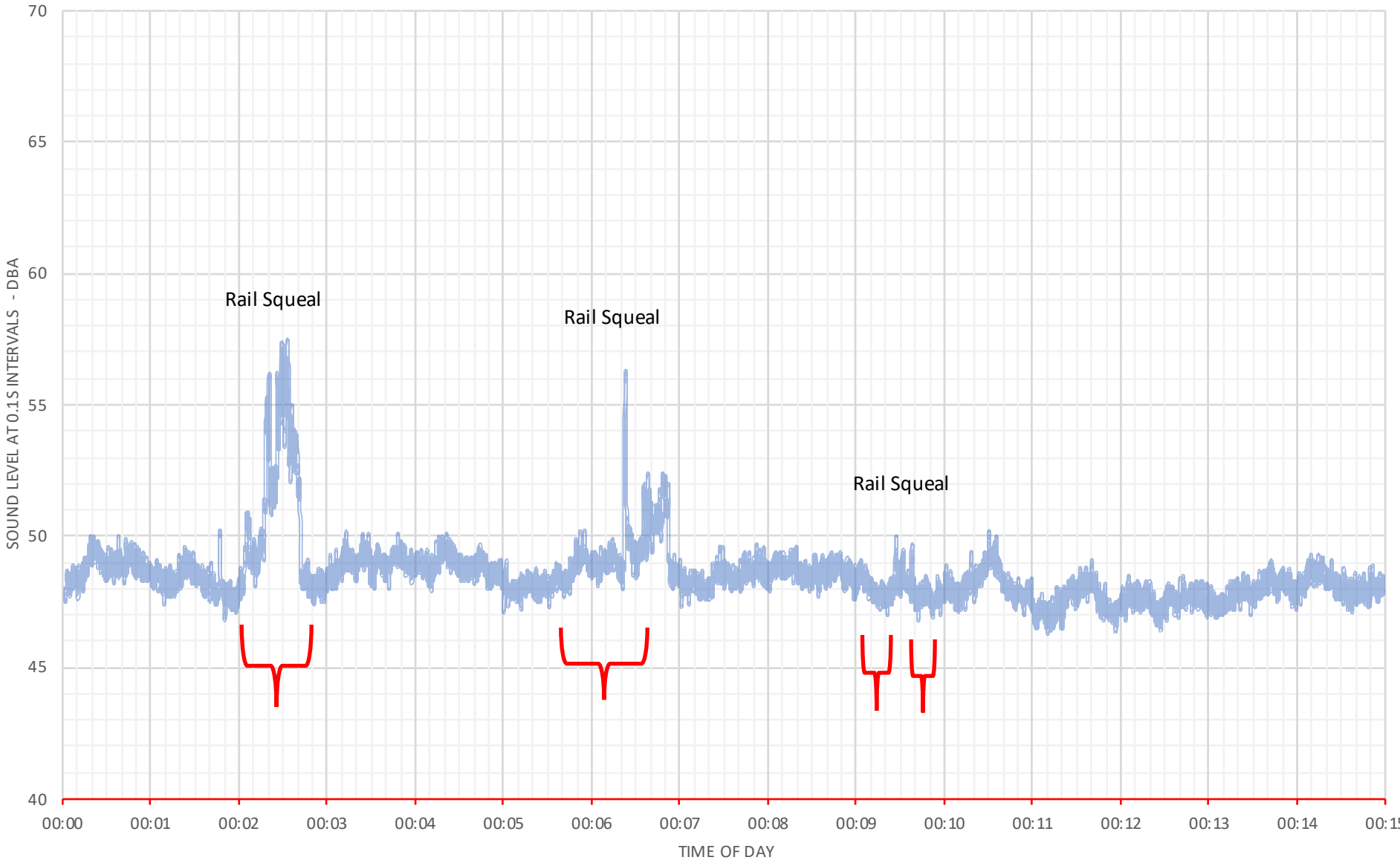


Figure F14: North Fence Attended Monitoring - Evening Time 28 Nov 24

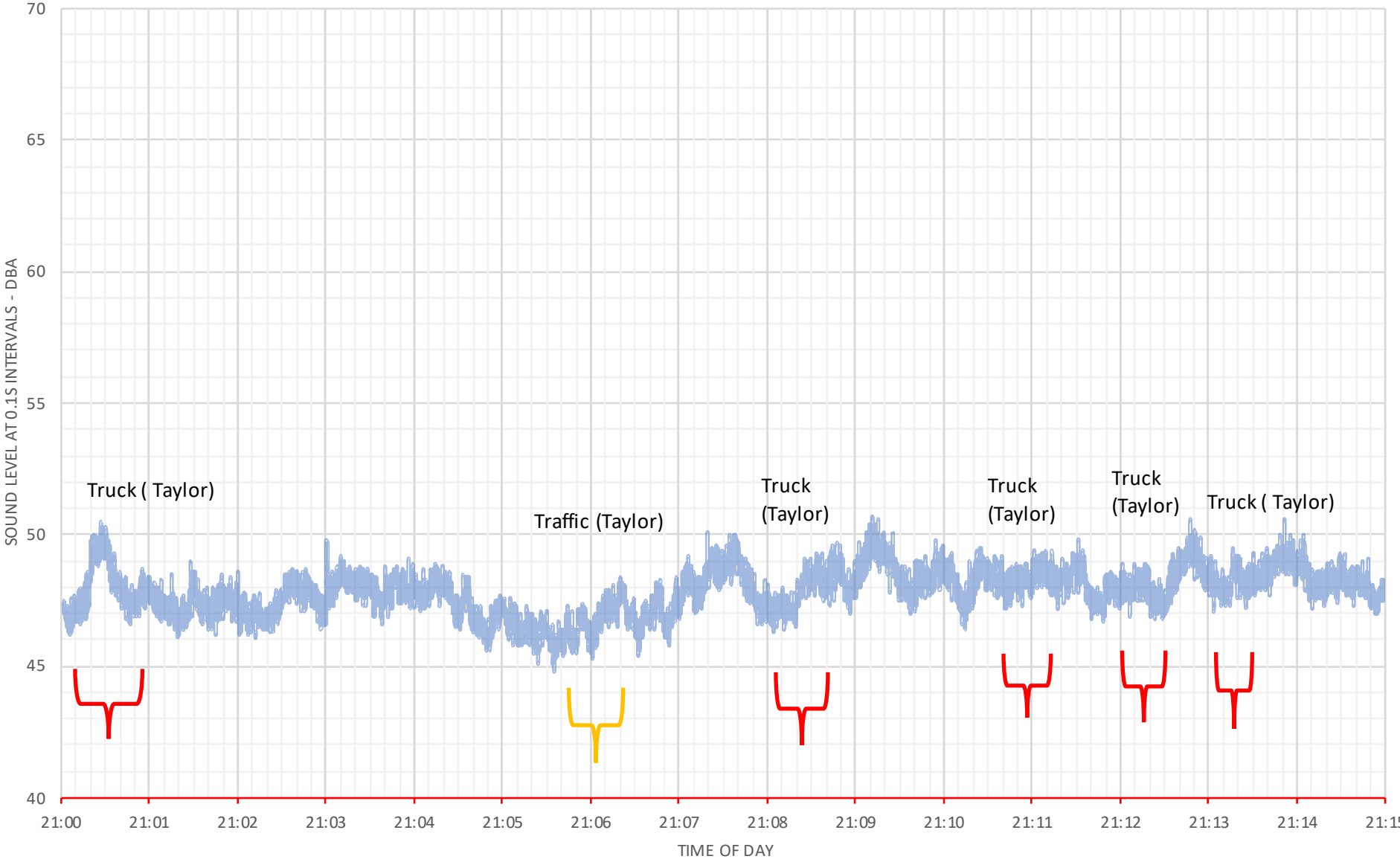


Figure F15: North Fence Attended Monitoring- Evening Time 4 Dec 24

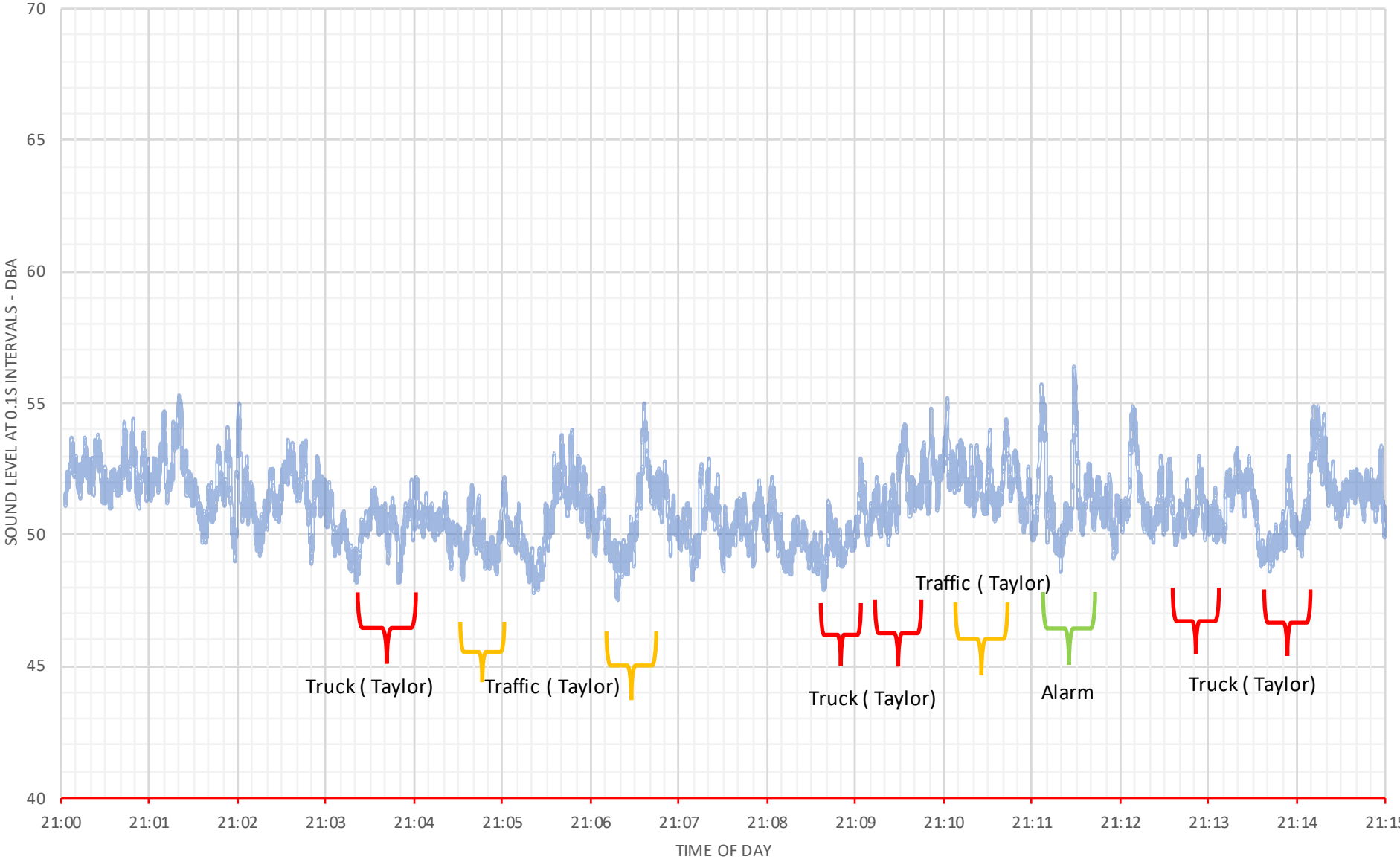


Figure F:16 North Fence Attended Monitoring- Evening Time 10 Dec 24

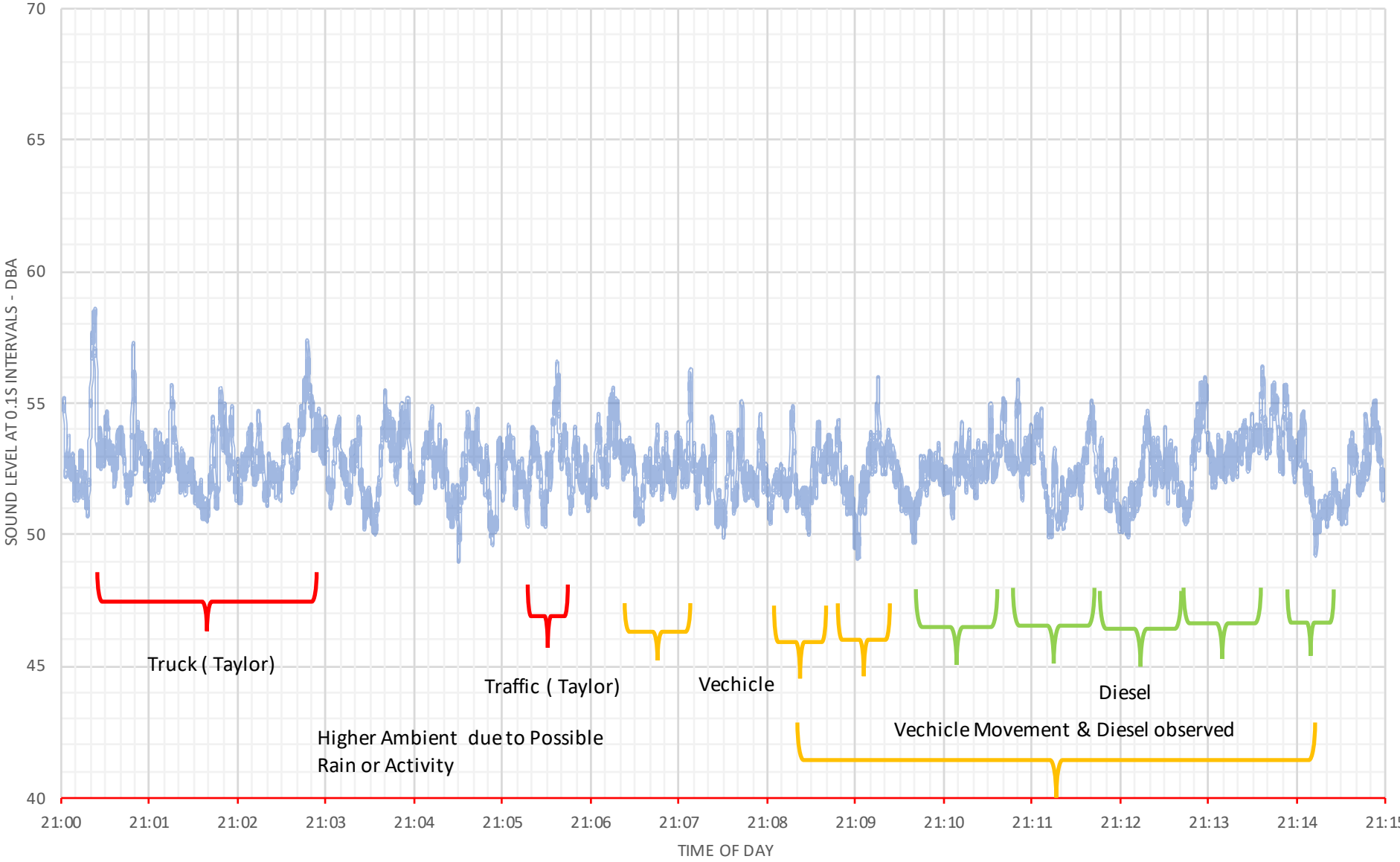


Figure F17: North Fence Attended Monitoring- Day Time. 6 Dec 24

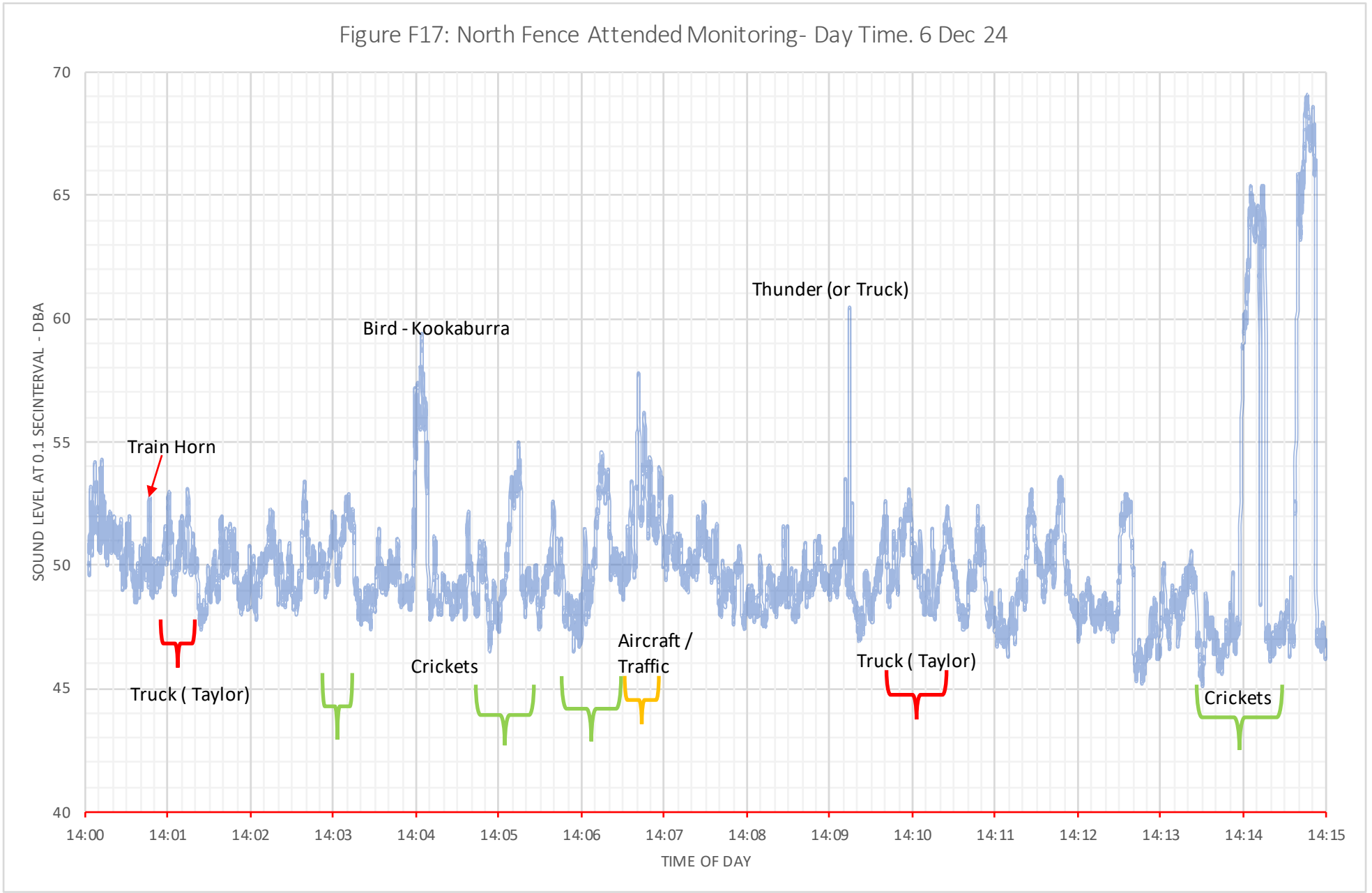
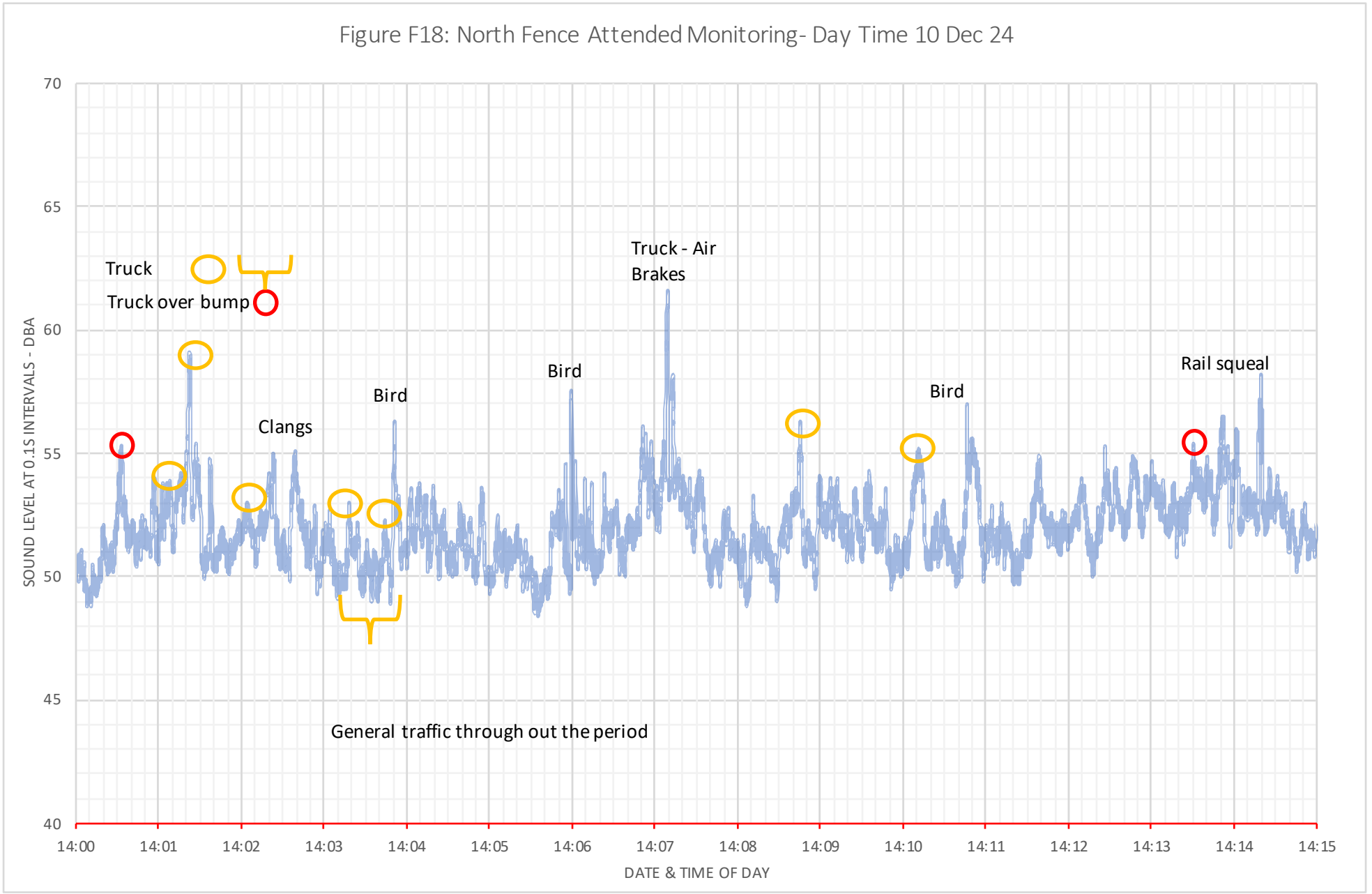


Figure F18: North Fence Attended Monitoring- Day Time 10 Dec 24



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APPENDIX 2 – COMMUNITY COMPLAINTS REGISTER MAY 24 TO APRIL 25

Date	Complainant	Contact	Nature of complaint	Response
17/9/2024	Berrima Resident	Direct to Site	dust on car	Car inspected and Voucher provided to clean car.
21/9/2024	Berrima Resident	Direct to Site	Dust on car	Car inspected and Voucher provided to clean car.
10/04/2024	Berrima Resident	Direct to Site	Dust on car	Car inspected and Voucher provided to clean car.
14/10/2024	Berrima Resident	Direct to Site	dust on solar panels	inspected and information provided
31/03/25	Berrima Resident	Direct to Site	noise	Resident advised there had been no changes in operations and as it was over the weekend even less operations than usual. As it had been cloudy, weather conditions may have made the noise seem louder than usual