



Boral Cement

Annual Environmental Noise
Assessment
September – November 2019

For

Berrima Cement Plant

30 November, 2019

Boral Cement Berrima

Annual Environmental Noise Assessment September - November 2019

Report of assessment

30 November 2019

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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.

Executive Summary

The Boral Cement Berrima works has noise limit conditions on two major projects, which are No.6 Kiln Upgrade and No.7 Cement Mill (from 2002 and 2007 respectively).. 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 these projects. Monitoring of both site source sound levels and residential receiver sound levels on an annual basis since 2008 has confirmed that both of the projects are in compliance with their noise limit conditions.

An annual review of the noise emissions from these projects is the subject of this report and includes sound levels measured at the Cement Plant and in the adjoining residential area of New Berrima. Previous rural residential receiver locations to the east and south-east of the site included in the approval conditions for the Projects no longer exist and are no longer included in the assessment.

Discussions with the NSW EPA since 2011 have sought to include noise limit conditions for the whole site (rather than just the two projects) but these conditions have yet to be finalised. A recommended noise objective for a nominated monitoring site has been proposed inside but close to the plant boundary where noise emissions from sources other than the Cement Plant are not significant; residential receiver locations are affected by other noise sources such as road traffic.

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

- comparative measurements at the same locations around major plant sources of noise which have been assessed previously as in compliance with the limit conditions;
- calculation of the contribution sound levels at residential receiver locations from those source emission locations which are higher than in the past and comparison with a contribution objective;
- monitoring of sound levels in residential receiver locations with unattended monitoring over long-term periods of two weeks and attended monitoring in day, evening and night-time to compare with long-term averages from previous years.

The findings of this 2019 annual environmental noise assessment are that the two projects are in considered to be compliance with their noise limit conditions 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 indicate that the Cement Plant is not increasing its emissions.

From the measurements at the proposed in-plant annual environmental noise monitoring location in the Store Yard, it is also considered that the plant is achieving its proposed objectives of 56 dBA for long-term $L_{A90,period}$ and 58 dBA $L_{A90,15-minutes}$ (unaffected by transient noise sources).

Sleep disturbance and Low-frequency noise assessment

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

Calculations of sleep disturbance potential use $L_{A01,1-minute} - L_{A90,15-minute}$ at night-time to provide comparisons with recommended maximum values for night-time of 60 dBA for $L_{A01,1-minute}$ night-time

for the Northern Boundary location and not greater than 15 dB difference for $L_{A01.1\text{-minute}} - L_{A90.15\text{-minute}}$. From the analyses it is considered 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 greater than 15 dB are relatively low and the noise emissions from the Cement Plant have a low potential for sleep disturbance. Trucks running over bumps on roads and warning signals from train horns or rail wheel squeal were likely to cause the 60 dBA objective to be exceeded.

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 both $L_{Aeq,15\text{-min}}$ and $L_{A90,15\text{-min}}$ values. For L_{eq} values the frequency band criteria are exceeded for most locations but not for all locations on the $L_{Ceq} - L_{Aeq}$ screening test limit criterion of 15 dB difference. For the L_{90} results, the screening levels were exceeded for some locations where the L_{eq} values are not, but most do not exceed the frequency band criteria except for exceedances in the 160 Hz band. It is considered that the residential receiver locations currently exceed the low frequency criteria in the NPI on some occasions mainly in daytime, but the source of this noise is not necessarily from the Cement Plant and is considered more likely to be from road traffic diesel vehicle noise.

Low frequency was also assessed at the Store Yard monitoring location although this is not a residential receiver location. Low-level exceedances of the low-frequency criteria were mainly in the 80 to 160 Hz region, typically related to diesel truck noise. These could be internal trucks close to the meter. At higher exceedances, the 40 Hz band is the main source but the source of this frequency is not known.

Site noise sources

Some sources of noise at the Cement Plant had increased sound levels from previous measurements. Recommendations for review of plant item performance or maintenance were made for the following:

For No.6 Kiln

- PHT Level 2.5 - A review of the condition of FA63 and its discharge silencer for 63 Hz band sound levels.
- The new kiln shell cooling fans have significantly increased the sound levels at locations on the northern side of the centre of Kiln 6. A review of alternatives for cooling of this area is recommended from a long-term aspect.
- Sound levels have increased by 7 dB in the grate cooler fan courtyard. The maintenance condition of the fans and their inlet silencers in this area – FA201 to 207, is recommended for review to identify if there is a reason for this increase.

For the No.7 Cement Mill and Cement Mill No.6:

- Cement Mill No.6 western wall fans discharge silencer.
- Cement Mill No.5 building FA502 and northern wall annex fan (DC702) fan discharges.

- Openings at the bottom of all main roller doors be able to seal to ground, not left open 50 to 100mm
- Openings of all smaller doorways be cleaned so they can close fully.
- Cement Mill No.6 - edges of the main northern wall doors have edge seals installed.

It is recommended that these items be reviewed for condition and silencers cleaned, replaced or installed if appropriate.

1 Introduction

Boral Cement Limited operates the cement works at New Berrima, 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 rest of the Berrima cement works are not included in the current Pollution Control Licence for the site. Figure 1.1 shows an aerial view of the cement works and surrounding area, with the location of Kiln 6 and No.7 Cement Mill indicated. Figure 1.2 shows an aerial view of the plant immediate locality with boundary environmental noise monitoring locations shown. A site layout plan of the works is shown in Figure 1.3.

Reports of compliance assessment of the two items of plant were provided in 2005 for Kiln 6 Upgrade and in 2007 for Cement Mill No.7. Noise monitoring of environmental noise and source noise is undertaken regularly in the neighbourhood of the plant and on site. Annual reporting of compliance assessments for the two projects has been made since 2007. Annual environmental noise assessments are provided to the NSW EPA and other statutory authorities.

For this 2019 annual noise compliance assessment, measurements of sound levels at the site and in residential areas of New Berrima were obtained from 10 to 26 September.

During the period of measurements, the Kiln was not operating for a period of 118 hours between 20:50 on 22 September to 18:36 on 27 September. The Raw Mills were off for the same period as well as for extended periods at other times separately. RM6 was off for 25 hours from 11pm on 1 October to 3am on 3 October. RM7 was off for 36 hours from midnight on 10 September to noon on the 11 September, 25 hours from midnight on 11 September to 1 am on 13 September, as well as 12 hours from 3pm on 18 September to 3am on 19 September and other 1 to 5 hour periods. Because of this the major stack fans FA39 and FA250, as well as raw mill feed fans FA38 and FA249 were at reduced speeds for different periods in the monitoring survey. Cement Mill 7 had idle periods from 15 minutes to 35 hours and Cement Mill 6 had idle periods from 7 minutes to 24 hours. Table 1.1 shows the times of non-operation of the major plant items and Figure 1.4 shows the non-operating periods graphically. Some of these periods will have affected measured sound levels at the residential receivers and some will not.

Measurements of continuous sound levels over the period 10 to 26 September were taken with logging sound level meters at previously measured residential and site boundary locations. A new location was added at 30 Adelaide Street to obtain background sound levels for residences potentially affected by truck movements from the proposed Austral Bricks quarry in East Berrima. Locations monitored were:

- 72 Taylor Avenue (near Adelaide St);
- 12 Brisbane Street;
- 4 Melbourne Street;
- 30 Adelaide Street
- Northern Boundary

- Store Yard (close)

Measurements at the Store Yard Close location were affected by rain and heat in the period 10 to 26 September. A two-week period of monitoring was repeated for this location from 6 to 19 November.

Measurements were not taken at the former sites of Chesley Park Farm and Candowie Farm, because those sites no longer exist as residences and cannot be accessed. Chesley Park Farm is on the Austral Bricks quarry project site and has been demolished. Candowie Farm appears to have become a truck depot at times and access is not available. Measurements were also taken on the operating site at the same locations as previously measured to provide comparisons with past measurements and conditions.

This report provides an assessment of compliance of the current operation of Kiln 6 Upgrade and Cement Mill 7. Results are compared to those taken in 2005, and 2006, then the continuous annual reviews from 2010 to 2018.

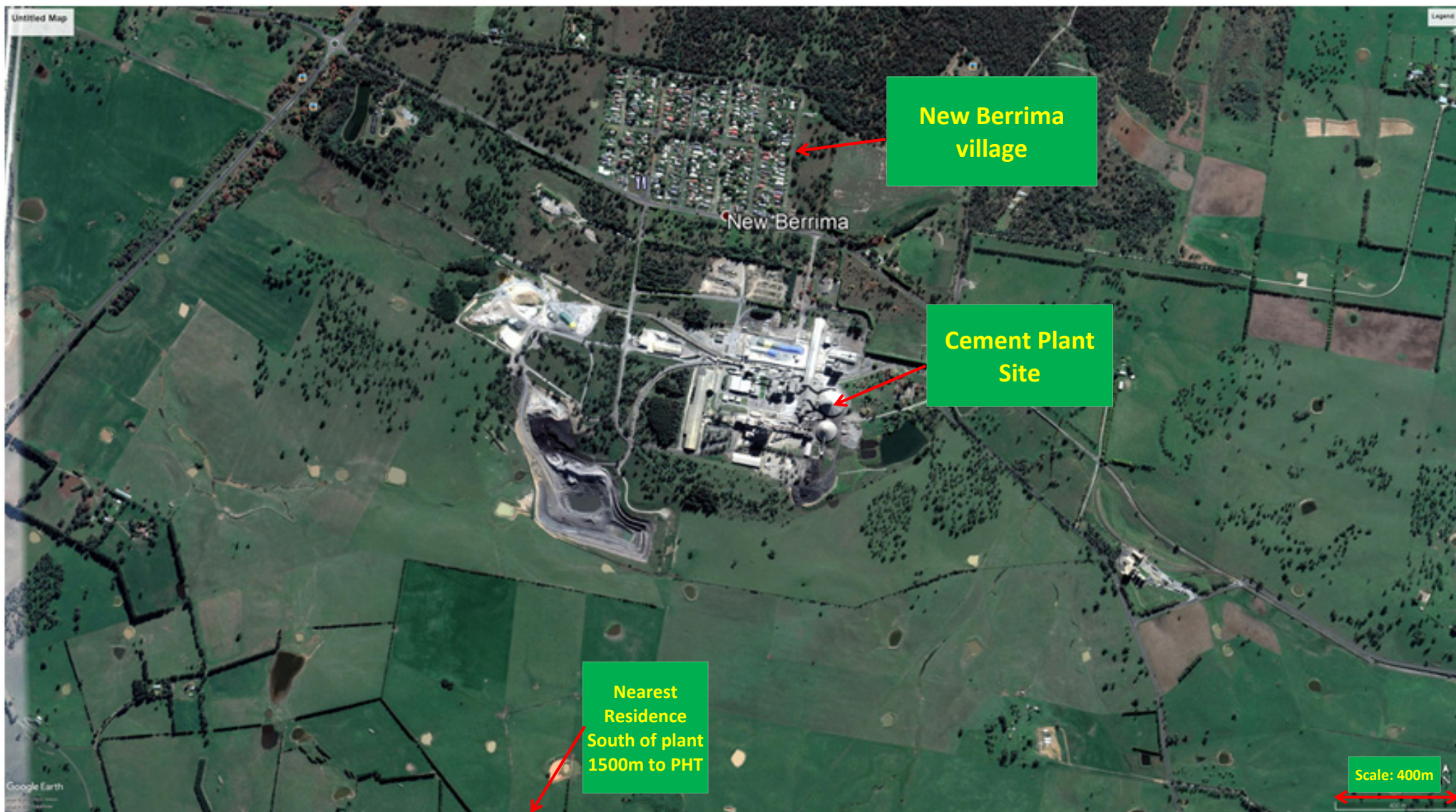


Figure 1.1: Boral Cement Berrima Annual Environmental Noise 2019- Plant location and surrounds

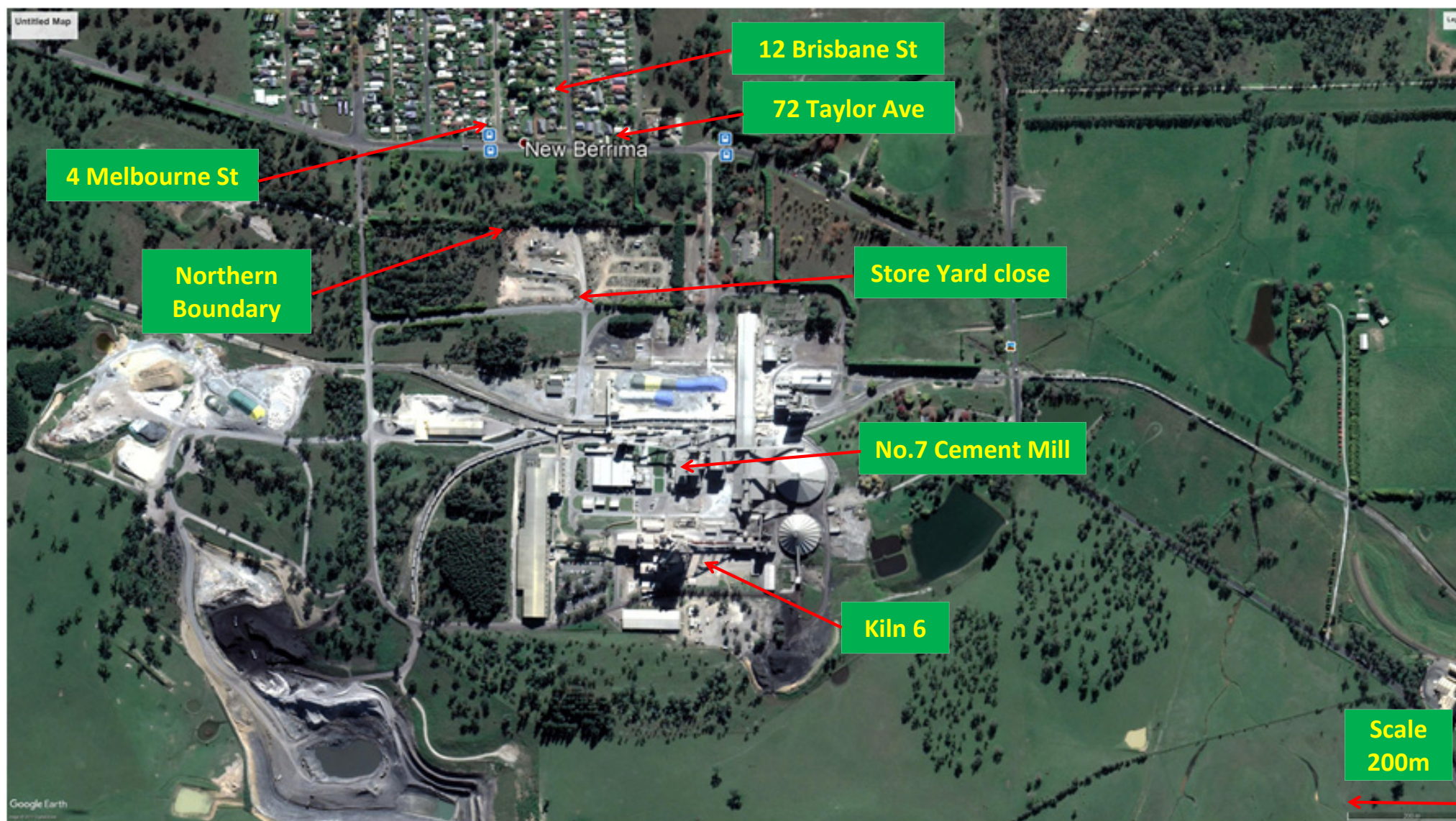


Figure 1.2: Boral Cement Berrima Annual Environmental Noise 2019 - Plant major items and Residential and boundary monitoring locations

Figure 1.4: Boral Cement Berrima Annual Noise 2019
Idle times of major plant items 10/9 to 2/10

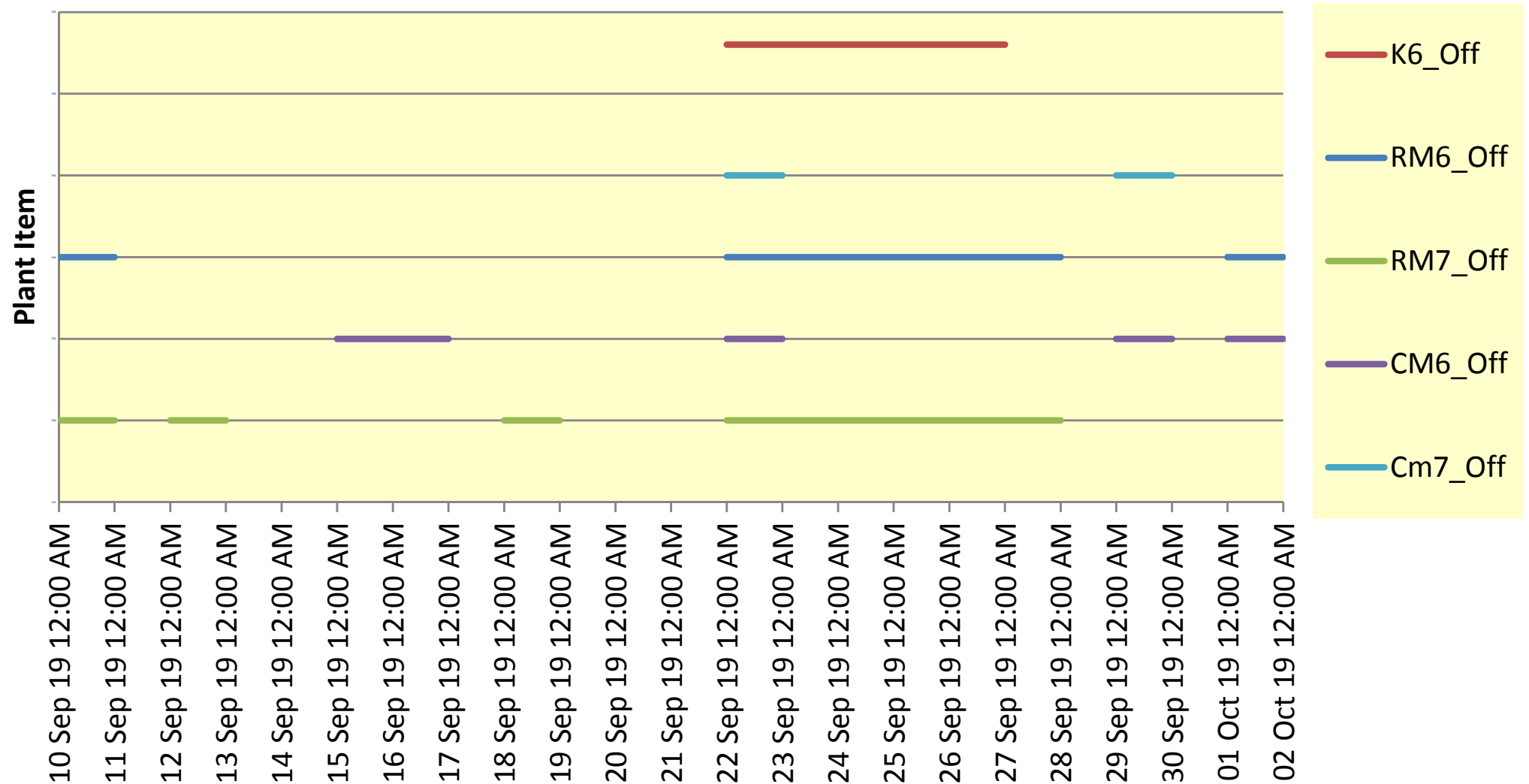


Figure 1.5: Boral Cement Berrima Annual Noise 2019 - Plant Idle Times 6 to 19 November 2019

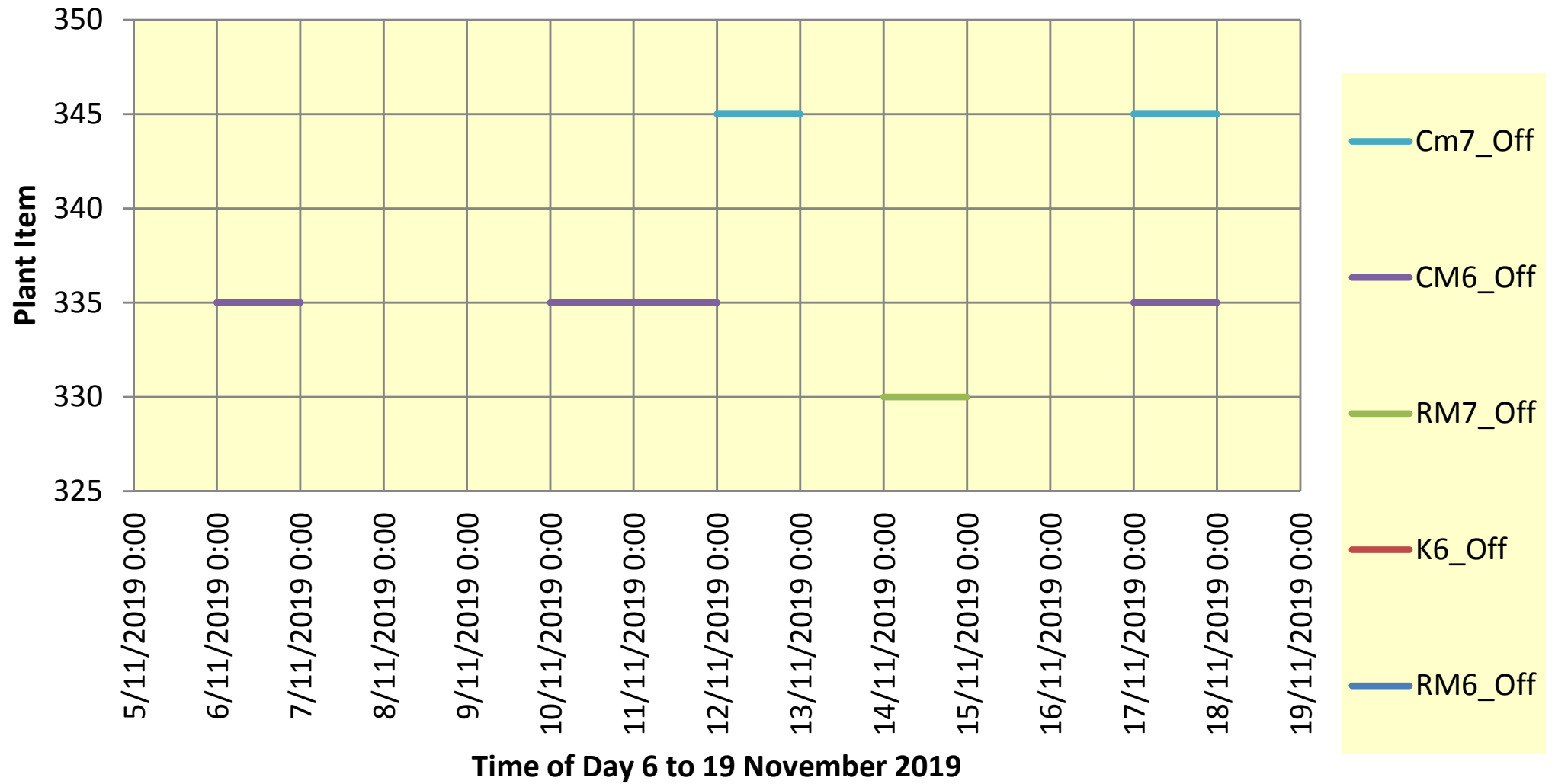


Table 1.1: Boral Cement Berrima Annual Noise 2019 - Idle periods of major plant items
9 September to 27 September 2019

CM6				CM7				RM7		
Off	On	Hours Off		Off	On	Hours Off		Off	On	Hours Off
2019-09-10 08:39:16	2019-09-10 09:31:16	0.87		2019-09-10 08:39:16	2019-09-10 09:34:16	0.92		2019-09-10 00:00:00	2019-09-11 12:10:17	36.17
2019-09-10 09:35:16	2019-09-10 09:54:16	0.32	2019-09-11 23:15:17	2019-09-11 23:38:17	0.38	2019-09-11 12:15:17	2019-09-11 12:41:17	0.43		
2019-09-13 05:50:17	2019-09-13 05:58:17	0.13	2019-09-12 22:16:17	2019-09-12 22:31:17	0.25	2019-09-12 00:02:17	2019-09-13 01:00:17	24.97		
2019-09-13 06:04:17	2019-09-13 06:13:17	0.15	2019-09-13 10:40:17	2019-09-13 11:16:17	0.60	2019-09-13 01:03:17	2019-09-13 01:36:17	0.55		
2019-09-13 06:38:17	2019-09-13 06:53:17	0.25	2019-09-13 13:44:17	2019-09-13 14:35:17	0.85	2019-09-13 11:07:17	2019-09-13 12:08:17	1.02		
2019-09-13 08:31:17	2019-09-13 08:39:17	0.13	2019-09-13 17:47:17	2019-09-13 19:01:17	1.23	2019-09-14 04:45:18	2019-09-14 07:12:18	2.45		
2019-09-14 00:20:18	2019-09-14 00:33:18	0.22	2019-09-14 12:50:18	2019-09-14 14:07:18	1.28	2019-09-14 07:57:18	2019-09-14 09:13:18	1.27		
2019-09-14 03:43:18	2019-09-14 04:49:18	1.10	2019-09-14 18:11:17	2019-09-14 20:25:18	2.23	2019-09-14 09:19:18	2019-09-14 09:37:18	0.30		
2019-09-14 09:37:18	2019-09-14 10:24:18	0.78	2019-09-14 20:32:18	2019-09-14 21:21:18	0.82	2019-09-14 09:58:18	2019-09-14 13:53:18	3.92		
2019-09-14 16:33:18	2019-09-14 17:28:18	0.92	2019-09-15 04:40:17	2019-09-15 14:58:18	10.30	2019-09-14 15:48:18	2019-09-14 17:53:18	2.08		
2019-09-14 23:11:18	2019-09-14 23:39:18	0.47	2019-09-15 18:57:18	2019-09-15 19:56:18	0.98	2019-09-14 18:14:18	2019-09-14 22:09:18	3.92		
2019-09-15 03:23:17	2019-09-15 05:27:17	2.07	2019-09-15 21:49:18	2019-09-15 22:06:18	0.28	2019-09-15 07:38:17	2019-09-15 09:03:18	1.42		
2019-09-15 09:58:18	2019-09-16 07:25:18	21.45	2019-09-16 00:02:18	2019-09-16 13:14:18	13.20	2019-09-15 17:08:18	2019-09-15 21:49:18	4.68		
2019-09-16 07:48:18	2019-09-16 10:11:18	2.38	2019-09-17 06:19:18	2019-09-17 06:51:18	0.53	2019-09-18 15:15:19	2019-09-19 02:55:19	11.67		
2019-09-16 23:05:18	2019-09-17 00:00:18	0.92	2019-09-18 02:19:18	2019-09-18 02:35:18	0.27	2019-09-19 10:08:19	2019-09-19 12:39:19	2.52		
2019-09-17 00:01:18	2019-09-17 00:50:18	0.82	2019-09-18 06:23:18	2019-09-18 14:00:19	7.62	2019-09-20 09:48:19	2019-09-20 10:20:19	0.53		
2019-09-18 19:43:19	2019-09-18 20:45:19	1.03	2019-09-18 15:36:19	2019-09-18 18:49:19	3.22	2019-09-20 13:06:19	2019-09-20 13:33:19	0.45		
2019-09-19 04:39:19	2019-09-19 07:08:19	2.48	2019-09-19 09:21:19	2019-09-19 16:08:19	6.78	2019-09-20 13:34:19	2019-09-20 13:59:19	0.42		
2019-09-19 07:21:19	2019-09-19 07:30:19	0.15	2019-09-20 11:22:19	2019-09-20 11:40:19	0.30	2019-09-20 14:35:19	2019-09-20 17:38:19	3.05		
2019-09-19 09:21:19	2019-09-19 16:53:19	7.53	2019-09-21 01:53:19	2019-09-21 02:19:19	0.43	2019-09-21 01:12:19	2019-09-21 03:00:19	1.80		
2019-09-19 21:25:19	2019-09-19 22:19:19	0.90	2019-09-21 13:35:20	2019-09-21 15:09:20	1.57	2019-09-22 00:09:20	2019-09-22 00:23:20	0.23		
2019-09-20 06:12:19	2019-09-20 06:27:19	0.25	2019-09-22 07:54:20	2019-09-23 19:15:20	35.35	2019-09-22 03:05:20	2019-09-22 03:17:20	0.20		
2019-09-21 00:18:19	2019-09-21 00:36:19	0.30			89.40	2019-09-22 20:38:20	2019-09-27 23:48:22	123.17		
2019-09-21 04:50:19	2019-09-21 05:33:19	0.72						227.21		
2019-09-21 15:01:20	2019-09-21 15:22:20	0.35	RM6			RM7 was off for 36 hours from midnight on 10 September				
2019-09-21 15:32:20	2019-09-21 15:39:20	0.12	Off	On	Hours Off	to noon on the 11 September, 25 hours from midnight on				
2019-09-22 01:53:20	2019-09-22 02:20:20	0.45	2019-09-10 05:11:16	2019-09-10 06:43:16	1.53	11 September to 1 am on 13 September, as well as 12				
2019-09-22 07:45:20	2019-09-23 07:14:20	23.48	2019-09-10 09:41:16	2019-09-10 09:52:16	0.18	hours from 3pm on 18 September to 3am on 19 September				
2019-09-23 17:56:20	2019-09-23 18:14:20	0.30	2019-09-10 10:16:16	2019-09-10 10:29:16	0.22	and other 1 to 5 hour periods.				
2019-09-24 03:26:20	2019-09-24 05:20:20	1.90	2019-09-10 10:35:16	2019-09-10 10:45:16	0.17					
2019-09-24 07:10:20	2019-09-24 07:43:20	0.55	2019-09-10 12:03:16	2019-09-10 12:29:16	0.43					
2019-09-24 10:12:21	2019-09-24 15:33:21	5.35	2019-09-10 14:53:16	2019-09-10 15:09:16	0.27					
2019-09-24 17:03:21	2019-09-24 17:16:21	0.22	2019-09-10 16:01:16	2019-09-10 16:22:16	0.35	K6				
2019-09-24 22:08:21	2019-09-24 22:51:21	0.72	2019-09-10 21:39:17	2019-09-11 00:19:17	2.67	Off	On	Hours Off		
2019-09-25 01:41:21	2019-09-25 02:22:21	0.68	2019-09-11 07:42:17	2019-09-11 11:37:17	3.92	2019-09-22 20:50:20	2019-09-27 18:36:22	117.77		
2019-09-25 07:25:21	2019-09-25 07:42:21	0.28	2019-09-11 13:33:17	2019-09-11 14:50:17	1.28	118 hours between 20:50 on 22 to 18:36 on 27 September				
2019-09-26 18:58:21	2019-09-26 19:40:21	0.70	2019-09-13 06:23:17	2019-09-13 06:45:17	0.37					
		81.43	2019-09-13 11:05:17	2019-09-13 12:39:17	1.57					
			2019-09-14 12:59:18	2019-09-14 13:16:17	0.28					
			2019-09-14 16:55:18	2019-09-14 19:09:18	2.23					
			2019-09-16 01:00:18	2019-09-16 02:00:18	1.00					
			2019-09-18 02:55:18	2019-09-18 15:13:19	12.30					
			2019-09-18 19:52:19	2019-09-18 20:06:19	0.23					
			2019-09-19 12:36:19	2019-09-19 12:47:19	0.18					
			2019-09-22 20:33:20	2019-09-28 06:25:22	129.87					
					159.05					
			RM6 was off for 25 hours from 11pm on 1 to 3am on 3 October							

Table 1.1A: Boral Cement Berrima Annual Noise 2019 - Idle periods of major plant items
9 September to 27 September 2019



Berrima Works - Plant Stops Summary

Stops From: 10/09/2019 - Until: 3/10/2019

Plant	Operating Hours	Process Failure	Mechanical Failure	Electrical Failure	Power Outage	Full Stock / Power Saving (Plant Available)	Full Stock / Power Saving (Plant Unavailable)	Quality Issues	Planned Maint.	Period Hours	Availability Factor (AF)	Utilisation Factor (UF)	Plant Free to be Operated	MTBF Days	Incident Stops
2nd PH String	455.2	0.0	1.1	0.0	0.0	0.0	0.0	0.0	119.7	576	99.8%	79.0%	79.0%	19.0	1
Cement Mill 6	465.9	19.4	11.3	0.0	0.0	69.6	0.0	0.0	9.9	576	93.8%	80.9%	93.0%	0.6	30
Cement Mill 7	454.4	9.0	13.9	0.9	0.0	80.7	0.0	0.0	17.1	576	95.0%	78.9%	92.9%	1.0	19
Incoming Raw Mat's	551.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	576	95.7%	95.7%	95.7%	23.0	1
Kiln 6	458.2	117.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	576	79.6%	79.6%	79.6%	19.1	1
Raw Mill 6	376.4	39.2	4.1	1.0	0.0	0.3	0.0	0.0	155.0	576	89.5%	65.3%	65.4%	0.9	18
Raw Mill 7	347.2	95.9	9.0	0.5	0.0	0.0	0.0	0.0	123.4	576	76.7%	60.3%	60.3%	0.6	23

Table 1.2: Boral Cement Berrima Annual Noise 2019 - Idle periods of major plant items
6 to 19 November 2019

CM6			CM7			RM6		
Off	On	Hours Off	Off	On	Hours Off	Off	On	Hours Off
2019-11-06 10:11:34	2019-11-06 10:28:34	0.28	2019-11-06 18:22:34	2019-11-06 18:40:34	0.30	2019-11-06 07:25:34	2019-11-06 11:13:34	3.80
2019-11-06 10:49:34	2019-11-06 11:39:34	0.83	2019-11-06 19:18:34	2019-11-06 19:34:34	0.27	2019-11-06 23:19:34	2019-11-06 23:38:34	0.32
2019-11-06 19:06:34	2019-11-07 00:59:34	5.88	2019-11-08 15:36:34	2019-11-08 16:00:34	0.40	2019-11-07 06:01:34	2019-11-07 18:57:34	12.93
2019-11-07 12:56:34	2019-11-07 14:53:34	1.95	2019-11-08 17:19:34	2019-11-08 18:42:34	1.38	2019-11-08 05:50:34	2019-11-08 07:01:34	1.18
2019-11-08 02:57:34	2019-11-08 14:48:34	11.85	2019-11-08 18:50:34	2019-11-08 19:24:34	0.57	2019-11-08 13:06:34	2019-11-08 13:27:34	0.35
2019-11-08 21:01:35	2019-11-08 21:13:35	0.20	2019-11-09 03:31:35	2019-11-09 04:34:35	1.05	2019-11-09 01:53:35	2019-11-09 04:55:35	3.03
2019-11-10 04:58:35	2019-11-10 05:26:35	0.47	2019-11-09 04:39:35	2019-11-09 05:10:35	0.52	2019-11-10 03:32:35	2019-11-10 04:26:35	0.90
2019-11-10 17:14:35	2019-11-12 05:34:36	36.33	2019-11-09 19:38:35	2019-11-09 20:11:35	0.55	2019-11-11 07:23:35	2019-11-11 08:28:35	1.08
2019-11-14 11:48:36	2019-11-14 15:25:36	3.62	2019-11-09 20:55:35	2019-11-09 21:13:35	0.30	2019-11-11 10:41:35	2019-11-11 11:11:35	0.50
2019-11-14 20:29:36	2019-11-14 21:02:36	0.55	2019-11-10 00:21:35	2019-11-10 00:37:35	0.27	2019-11-12 12:43:36	2019-11-12 18:57:36	6.23
2019-11-15 09:54:36	2019-11-15 15:07:36	5.22	2019-11-10 01:37:35	2019-11-10 04:27:35	2.83	2019-11-13 11:56:36	2019-11-13 17:42:36	5.77
2019-11-17 21:21:37	2019-11-17 23:55:37	2.57	2019-11-10 05:14:35	2019-11-10 07:44:35	2.50	2019-11-14 11:33:36	2019-11-14 11:44:36	0.18
2019-11-18 00:28:37	2019-11-18 01:19:37	0.85	2019-11-10 17:41:35	2019-11-10 18:31:35	0.83	2019-11-14 13:26:36	2019-11-14 13:41:36	0.25
2019-11-19 11:54:37	2019-11-19 12:27:37	0.55	2019-11-10 20:30:35	2019-11-10 20:56:35	0.43	2019-11-14 13:42:36	2019-11-14 23:19:36	9.62
2019-11-19 16:07:37	2019-11-19 18:21:38	2.23	2019-11-10 22:28:35	2019-11-10 22:48:35	0.33	2019-11-15 01:09:36	2019-11-15 01:24:36	0.25
2019-11-19 18:34:38	2019-11-19 19:33:38	0.98	2019-11-12 13:31:36	2019-11-13 19:57:36	30.43	2019-11-17 06:04:37	2019-11-17 07:01:37	0.95
		74.37	2019-11-15 09:55:36	2019-11-15 15:28:36	5.55	2019-11-17 14:18:37	2019-11-17 15:09:37	0.85
K6			2019-11-15 15:32:36	2019-11-15 16:03:36	0.52	2019-11-19 16:24:37	2019-11-19 17:21:38	0.95
Off	On	Hours Off	2019-11-16 04:03:36	2019-11-16 04:33:36	0.50	2019-11-19 23:34:38	2019-11-20 00:00:00	0.42
2019-11-12 12:45:36	2019-11-12 15:23:36	2.63	2019-11-17 17:22:37	2019-11-18 15:42:37	22.33			49.57
2019-11-14 13:56:36	2019-11-14 14:12:36	0.27	2019-11-18 19:18:37	2019-11-18 19:34:37	0.27	RM7		
2019-11-14 15:44:36	2019-11-14 17:57:36	2.22	2019-11-18 20:21:37	2019-11-18 20:38:37	0.28	Off	On	Hours Off
2019-11-14 18:05:36	2019-11-14 19:18:36	1.22	2019-11-18 20:40:37	2019-11-18 21:14:37	0.57	2019-11-06 07:59:34	2019-11-06 09:47:34	1.80
2019-11-14 19:21:36	2019-11-14 20:47:36	1.43	2019-11-19 11:33:37	2019-11-19 12:19:37	0.77	2019-11-07 05:57:34	2019-11-07 18:27:34	12.50
2019-11-14 20:56:36	2019-11-14 21:36:36	0.67	2019-11-19 16:08:37	2019-11-19 16:30:37	0.37	2019-11-07 18:34:34	2019-11-07 18:48:34	0.23
		8.43	2019-11-19 17:25:38	2019-11-19 17:50:38	0.42	2019-11-08 05:56:34	2019-11-08 06:31:34	0.58
			2019-11-19 17:52:38	2019-11-19 20:28:38	2.60	2019-11-08 13:05:34	2019-11-08 13:55:34	0.83
			2019-11-19 21:51:38	2019-11-19 22:12:38	0.35	2019-11-10 03:29:35	2019-11-10 05:10:35	1.68
			2019-11-19 22:46:38	2019-11-19 23:25:38	0.65	2019-11-10 12:32:35	2019-11-10 13:35:35	1.05
					78.13	2019-11-10 14:01:35	2019-11-10 14:13:35	0.20
						2019-11-10 14:17:35	2019-11-10 14:46:35	0.48
						2019-11-10 15:33:35	2019-11-10 15:55:35	0.37
						2019-11-10 19:29:35	2019-11-10 20:00:35	0.52
						2019-11-11 01:41:35	2019-11-11 01:52:35	0.18
						2019-11-12 12:04:36	2019-11-12 20:19:36	8.25
						2019-11-13 11:55:36	2019-11-13 17:52:36	5.95
						2019-11-14 13:54:36	2019-11-14 23:57:36	10.05
						2019-11-17 19:37:37	2019-11-17 19:51:37	0.23
						2019-11-19 01:21:37	2019-11-19 01:54:37	0.55
						2019-11-19 16:14:37	2019-11-19 19:27:38	3.22
						2019-11-19 19:28:38	2019-11-19 19:45:38	0.28
								48.97

Table 1.2A: Boral Cement Berrima Annual Noise 2019 - Idle periods of major plant items
6 to 19 November 2019



Berrima Works - Plant Stops Summary

Stops From: 6/11/2019 - Until: 20/11/2019

Plant	Operating Hours	Process Failure	Mechanical Failure	Electrical Failure	Power Outage	Full Stock / Power Saving (Plant Available)	Full Stock / Power Saving (Plant Unavailable)	Quality Issues	Planned Maint.	Period Hours	Availability Factor (AF)	Utilisation Factor (UF)	Plant Free to be Operated	MTBF Days	Incident Stops
2nd PH String	343.7	11.8	0.0	4.5	0.0	0.0	0.0	0.0	0.0	360	95.5%	95.5%	95.5%	4.8	3
Cement Mill 6	285.8	9.4	24.9	0.9	0.0	2.6	0.0	0.0	36.3	360	89.0%	79.4%	80.1%	0.9	14
Cement Mill 7	282.6	15.2	17.0	2.5	0.8	22.4	19.5	0.0	0.0	360	89.1%	78.5%	84.7%	0.6	19
Incoming Raw Mat's	360.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	360	100.0%	100.0%	100.0%	15.0	0
Kiln 6	352.1	5.6	0.0	2.3	0.0	0.0	0.0	0.0	0.0	360	97.8%	97.8%	97.8%	4.9	3
Raw Mill 6	292.6	9.4	8.8	1.0	0.0	30.1	0.0	0.0	18.1	360	93.8%	81.3%	89.7%	1.1	11
Raw Mill 7	299.7	6.0	6.3	2.4	0.0	34.2	0.0	0.0	11.3	360	95.3%	83.3%	92.8%	1.0	12

2 Contribution sound level objectives and method of measurement and assessment

2.1 Contribution sound level objectives

Each project was given contribution objective sound levels for the residential receiver locations. These were as follows:

Table 2.1 – Kiln 6 Upgrade Maximum Allowable Noise Contribution Limit dBA

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
Chesley Park Farm*	30	30	30
Candowie Farm*	37	37	37

Table 2.2 Cement Mill No.7 Maximum allowable noise contribution limit dBA

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	43	43	40
Argyle Street, near Taylor Avenue	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 10:00pm to 7:00am Monday to Saturday and 10:00pm to 8:00am on Sundays and public holidays

These levels are to be considered as the contributions from the new plant associated with Kiln 6 or Cement Mill No. 7, and do not apply to the noise emissions from the rest of the plant at Berrima.

As advised in the 2017 assessment, in 2015 Chesley Park Farm was acquired by Austral Bricks for their proposed development and the residence demolished. This effectively removed the assessment location as there was no receiver and no access available to the site. Similarly, Candowie Farm access is no longer available as it is no longer apparently occupied as a residence, the land having

been acquired for a future industrial development. This location has also been effectively removed from the assessment.

2.2 Method of measurement and assessment

Kiln 6 Upgrade

The environmental impact assessment report provided allowable sound power levels for each major source in the Kiln 6 Upgrade required to ensure the contribution sound level objective was achieved. From those calculated sound power levels, allowable sound pressure levels at different locations and distances from each major source in each plant area were also calculated. The measured sound levels from the operating individual sources were then compared with the calculated allowable sound levels. If the measured sound levels were less than the allowable sound levels, then compliance was achieved. These measurements were reported in the nominated compliance reports for each plant item.

For Kiln 6 Upgrade, sound power levels and associated sound pressure levels of the new sources were identified as required in the noise impact assessment. These are given in Table 2.3 below. In the compliance assessment report for the Kiln 6 Upgrade provided in 2005, the measured sound levels were compared with the objective sound levels. These are also shown in Table 2.3.

Table 2.3: Kiln 6 Upgrade Plant Items and Objective Sound Power Levels and Sound Pressure Levels required to achieve compliance with objective sound levels

Source	Sound Power Level – dB(A)	Sound Pressure Level dB(A)		
		Objective	Measured 2005	Measured 2019
Coal Mill and Clinker cooler fans	117	100 @ 3m	93 @ 2m	Coal mill wall vent 88 @ 1m, Courtyard cooler fans 87 to 99 @ 1m
New Radicon Cooler	103	92 @ 1m	81 @ 1m West 80 @ 2m East	82 to 86 @ 1m Area Average 85 @ 1m E side 77 @ 2.4m E
New Pre-heater fan FA249	97	89 @ 1m	77 @ 2m	81 to 84 @ 1m
New Baghouse fan FA250	102	94 @ 1m	82 @ 2m	82 to 86 @ 1m
Raw Mill 7 Building	117	100 @ 3m	Vents 83 to 86 @ 1m	Vents 78 to 83 @ 1m Roof 81 to 90 @ 1m

This comparison showed in 2005 that the noise emissions for the Kiln 6 Upgrade items were well below the objectives required to achieve compliance.

Comparison of current measured sound levels at the same or similar locations, with those measured for the compliance assessment, will be sufficient to indicate if the contribution objectives are currently being achieved. Results for 2019, some shown above, are similar to previous and lower than the objective maximum levels

Increases of more than 5 dBA would be required to indicate potential non-compliance with the licence conditions. Radicon cooler sound levels vary depending on load and sometimes in the past have exceeded the objective by 4 to 5 dB. Sound levels measured in 2019 were 82 to 86 dBA at 1m, much lower than the objective

Cement Mill No.7

Assessment of compliance for Cement Mill No.7 was made by measuring the noise emissions from the building and then calculating the contributions from these at the relevant residential receiver locations, using a recognised computer noise model. Three different meteorological conditions were used in the modelling. The results of these predictions are given in Table 2.4 below. The DECCW considered this approach a good example of a method to assess contributions from new noise sources in the presence of a relatively high background sound level.

Table 2.4: Cement Mill No.7 Predicted Contribution Levels at receivers for 2007 sound levels

Receiver	Source	Predicted sound level – dB(A)		
		Wind 0 m/s Lapse 0°C/100m	Wind 3 m/s Lapse 0°C/100m	Wind 2 m/s Lapse 3°C/100m
Adelaide Street	Mill Room northern wall	23	29	29
	BE Tower northern wall	22	25	26
	Compressor room vents	<u>15</u>	<u>20</u>	<u>21</u>
	Total	26	31	31
Argyle Street	Western wall Mill room	17	28	28
	Western Roll door	14	25	26
	Mill room			
	Western Wall vents I & J	13	19	20
	Western Wall BE Tower	10	17	17
	Western Roll door compressor room	<u>9</u>	<u>16</u>	<u>16</u>
	Total	21	30	31

The Candowie Farm calculations provided in previous years are no longer relevant as the residence is apparently no longer used and is part of an industrial zone.

As with the Kiln 6 Upgrade items measurements, comparison of current measured sound levels at the same or similar locations, with those measured for the compliance assessment, will be sufficient to indicate if the contribution objectives are currently being achieved. Increases of more than 9 dBA would be required to indicate potential non-compliance with the licence conditions.

Results from 2019 shown later in Section 3 Table 3.7 and 3.8, again indicate that compliance is being achieved by Cement Mill No.7.

2019 receiver and boundary monitoring

As well as the site noise source monitoring, environmental receiver sound levels are measured. The set of measurements for 2019 was done between 10 to 2 October 2019, with attended measurements on 10 September (day periods) and 2 October (daytime, evening and night-time periods).

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 will also indicate any trends in receiver location sound levels occurring over the monitoring period since 2002.

There appear to be no relevant residential locations east of the Cement Plant, following the demolition of Chesley Park farm-house and the use of the Candowie site as an industrial or commercial site. These locations and potential receivers will continue to be reviewed annually in case additional receivers are located east of the plant. No new locations were identified in 2019.

2.3 PRP-7 2011

Under the 2011 Environment Protection Licence, a pollution reduction program was requested by the EPA to calculate Project Specific Noise Levels (PSNLs) for the plant, according to the NSW Industrial Noise Policy. Measurements of background sound levels were obtained in the same residential receiver locations as used in this 2013 compliance assessment, when the plant was not operating in June and July 2011. PSNLs were calculated and submitted with a report to the EPA. These were given as $L_{AEQ,15-min.}$, $L_{A90,15-min.}$ and $L_{A01,1-min.}$ contribution sound levels at the receiver locations. Values for these are shown in Table 2.5 as follows:

Table 2.5: Recommended PSNLs calculated for representative receiver locations

Receiver location	Period	Recommended PSNL $L_{Aeq,period}$	Inferred Recommended Average $L_{A90,period}$	Recommended PSNL for Night-time $L_{A01.1-min}$
Taylor Avenue near Adelaide St	Day	48	43	58
	Evening	44	39	
	Night	43	38	
4 Melbourne St	Day	46	41	56
	Evening	42	37	
	Night	40	35	
Chesley Park Farm	Day	49	44	54
	Evening	45	40	
	Night	40	35	
12 Brisbane St	Day	51	46	56
	Evening	45	40	
	Night	40	35	
Northern Boundary	Night			60

The PRP has yet to be finalised or included in Licence conditions. As part of the PRP response, it has been proposed that a new monitoring location be placed at the “Store Yard Close” location. This is proposed to replace all other monitoring and have an objective of $L_{A90,period}$ of 56 dBA averaged over 7 days, or $L_{A90.15-minutes}$ of 58 dBA. This objective is based on $L_{A90.15-minute}$ averages to avoid variability occurring with passing traffic outside and inside the plant which occurs with $L_{Aeq.15-minute}$ values. This objective is yet to be agreed with the NSW EPA.

The new Store Yard Close location is proposed to enable measurement of only Cement Plant noise emissions. Other residential and boundary locations receive noise immission from other sources as well, especially road traffic, which confound the measurement results if they were used to assess the Cement Plant. Results from this new location were commenced in 2015 and are included in this 2019 assessment. The location is shown in Figure 1.2.

3 Measured sound levels in 2019 compared to previous measurements

3.1 Kiln 6 area sound levels

The plan view of the Kiln 6 area and upgrade plant items are shown in Figure 3.1. Figures 3.2 to 3.5 show measurement locations around the Kiln and upgrade items area.

Sound levels measured at locations around Kiln 6 Upgrade plant items are shown summarised in Table 3.1. Table 3.2 shows the spectra of each measurement, with the tonality assessment shown in Table 3.2A and Figures given in Appendix A. Table 3.3 compares the results of sound levels measured at the same location on previous occasions from 2010 to 2018 and shows the calculated differences.

If the 2019 measured sound level exceeds the previous sound levels by more than 3dB, the cell difference in Table 3.3 is highlighted pink. A difference value of 3 dB is considered to be indicative of a potentially significant change in emission, as less than this is within measurement error or variation expected from location or source load differences. The locations with increased sound levels are shown in Table 3.3A.

There were 75 locations where 2019 sound levels have been calculated to be above those of previous years back to 2010. Some of these increases are caused by open doorways, a different load condition, other mobile equipment or vehicle operations nearby or a different measurement location.

For locations with an increase of 3 dB or more, other than for noise from passing traffic or open doors or vehicles or other non-normal noise source nearby, calculations of the effects of those increases on received sound are provided in Table 3.4. These are described below, with reference to increases shown in Table 3.3 and the effects calculated in Table 3.4. One-third octave band spectra and calculated tonality for each measurement location are shown in Appendix A in Figures A1 to A44. Locations where increased sound levels occurred are described below.

For the locations shown with calculations in Table 3.4, most had calculated contributions below the objectives for Kiln 6 Upgrade. On Level 4 centre of the old PHT by the stairs, an increase of 6 dB was measured compared to that of 2018. This was caused by the operation of an air-canon during the measurement period. The calculated increase at residential receivers for this instantaneous event measured over a 42 second period was up to 6 dB above the objective for a 15 minute period. The L_{A90} sound level for the measurement did not have an increase. When calculated for the 15-minute contribution the sound level would not have increased. The PHT Level 4 spectra shown in Figure A10 show the sound levels were broad band and not tonal.

The other two locations where increases in sound levels caused calculated contribution sound levels above the objectives were on the northern side of the kiln opposite or near the four or more new additional central kiln-shell cooler fans, and in the grate cooler fan courtyard. For the locations near the additional kiln shell cooler fans, the sound levels of the additional 4 or more fans operating compared to previous years when there were none at that location, are expected to cause the calculated increase, which was up to 16 dB above the objectives. When additional attenuation from ground and air absorption are included and the sound levels averaged over the length of the kiln, these additional fans may result in slightly increased sound levels at the residential receiver locations. Spectra for the location are shown in Figure A38 and are broad-band and non-tonal.

It is recommended that a review be made of alternatives for kiln shell cooling fans with reduced noise emissions.

For the grate cooler fan courtyard, a significant increase of up to 7 dB at several locations was noted compared to those of previous years. These were calculated to cause a sound level contribution at the receiver locations of up to 11 dB above the objectives, without considering the barrier reduction effect of the adjacent compressor house. Spectra for the courtyard area are shown in Figure A39 and are again broad-band and non-tonal.

It is recommended that a review of the maintenance condition of the fans and their inlet filter silencers be made to assess the reasons for the increased sound levels.

Sound levels around the eastern side of RM7 and the fans FA249 and FA250 were elevated compared to previous years. This was because of tonal noise from screw-conveyor squealing in the area, not from an increase in fan noise or other baghouse associated sources.

Sound levels measured on top of the Control Building roof indicate the sound coming from the PHT and kiln area towards the residential receivers. The sound levels on the southern side of the building have remained relatively constant since commencing these measurements since 2016. Frequency spectra are shown in Figure A44 and are very broad-band and non-tonal.

Assessment of Kiln 6 Upgrade noise emission

Over all, the sound levels associated with Kiln 6 Upgrade sources were considered to not exceed the contribution objectives at the nearest residential receivers to the northern and southern sides of the plant, apart from those associated with the new kiln shell cooler fans on the central pedestal of Kiln 6. Some closer location measured sound levels had increased but these were calculated to not exceed the objectives at the residential locations for the Kiln 6 Upgrade items. More distant measurements of the total emissions from the Kiln 6 area on the roof of the Control Building had not increased significantly from previous measurements, which also indicated compliance with the objectives for the Project.

On the basis of the measurements and assessment, it is considered that the Kiln 6 Upgrade project is in compliance with its conditions of approval for sound levels.

Some specific sources are recommended for review because of increased sound levels above what is expected or to avoid potentially annoying sound levels developing further. These items are noted below:

- The new kiln shell cooling fans have significantly increased the sound levels at locations on the northern side of the centre of Kiln 6. A review of alternatives for cooling of this area is recommended.
- Sound levels have increased by 7 dB in the grate cooler fan courtyard. The maintenance condition of the fans and their inlet silencers in this area – FA201 to 207, is recommended for review to identify if there is a reason for this increase.

3.2 No.7 Cement Mill Project sound levels

Figure 3.6 shows an aerial view of the area around the No. 7 Cement Mill and Cement Mill No.6. Figure 3.7 shows a plan view of the buildings and measurement locations used. Figure 3.8 shows these locations on an aerial view.

Results of sound levels measured around Cement Mill No.7 are shown in Table 3.5. Measurements were taken with CM7 mill operating on 10 September and 2 October 2019. measurements in previous years have shown that at some locations, especially on the southern side of CM7, other Cement Plant sources are the main source of noise at the location – for example the kiln shell cooling fans, PHT fans and fan emissions from CM5 and CM6 buildings.

Measurements of sound levels around the Cement Mill No.6 area were also obtained on the same days as for CM7 and are also shown in Table 3.5. Measurements inside the CM7 building are shown in Table 3.5A.

One-third octave band frequency sound levels for CM7 and CM6 are shown in Table 3.6 and calculation of the tonality of the measured sound levels is shown in Table 3.6A. Graphs of the spectra and tonality for the areas of No.7 Cement Mill and surrounds and CM6 are shown in Appendix A Figures A45 to A53.

The difference in sound levels at the same locations between the 2019 operating sound levels and 2009 to 2018 operating sound levels of CM7 for external locations are shown in Table 3.7. If the differences in sound levels between 2018 and those of previous years are greater than 3 dB, the difference is highlighted (as was done for the Kiln 6 Upgrade assessment shown in Table 3.3). For locations with an increased sound level, Table 3.8 provides a calculation of the contribution sound level at residential locations and a comparison of that with the objectives for the CM7 project.

Differences for CM7 internal sound levels are shown in Table 3.7B. There were two locations where increases of more than 2 dB occurred at any of the internal locations in CM7 while most were the same or lower than in 2018. The increased level locations are likely to have been caused by a slightly different location close to a source such as a drive motor.

For sound levels outside around the CM7 building and its associated plant, there were 8 out of 27 locations with sound levels increased by more than 3 dB compared to those of years 2010 to 2018. Most of these were on the western side of the building where noise emissions from other parts of the Cement Plant are the main source, rather than the CM7 building.

Sound levels near the Control Building access stairs (Location A in Figure 3.48) were 4 dB higher than in 2010 but similar to those measured since. Sound levels were 73 dBA with CM7 operating and 69 dBA when it was not (in 2018); this is the same level as measured with CM7 operating in 2010. The calculated contribution assuming a distance of 25m to the source was 2 to 10 dB below the objective for village side receivers, the highest being at Argyle St. Spectra and tonality are shown for this area in Figure A45 and show there are no tonal qualities for the measurements. Sound levels in this location are from a combination of sources including the Kiln and train unloading activities. If the contributions from the kiln were removed, the actual contribution sound level without considering air or ground absorption attenuation would be 2 dB lower. These results are the same as for 2018.

Sound levels at Location D were 1 dB lower than in 2018 and similar to those since 2013. They were 7 dB higher than in 2010. Table 3.8 calculates that if the total sound level at this location was from CM7, the contribution sound levels calculated at residential receivers would be well above the

objectives. However sound levels at location D are influenced by many sources including the CM6 western wall fans and Kiln 6 sources and it is considered that this 2019 measured sound level is not mainly from CM7.

The same effects are considered to occur at locations G, J', and H, which have also had 4 to 6 dB increases compared to 2010. Spectra for these locations shown in Figure A45 and A46 show they are also non-tonal. Calculated sound level contributions for these locations in Table 3.8 also show that for location G, it exceeds the objectives because the assumed source distance was 13.5m. The calculations for locations J' and H showed calculated contribution sound levels were less than 20 dBA at all receivers.

Sound levels at Location H by the western main roll door of CM7 were 5 dB higher than in 2011. This increase is likely to have been caused by the door being not fully sealed to the ground and being open for approximately 100mm. The calculated contribution from this source was less than 17 dBA at residential receivers. Figure A45 also shows it is a broad-band spectrum with no tonal aspects.

The only other location for CM7 where sound levels increased were for the front of TS3 where sound levels increased by just under 3 dB. Calculated contributions sound levels from this area were less than 20 dBA at residential receivers.

Assessment of Compliance for No.7 Cement Mill Project

The comparison of sound levels measured in 2019 with those of previous measurements was found to not be significantly different to those measured in the initial assessment of 2008. Some locations had increased sound levels but these are considered to have been from sources other than CM7. Predicted contribution sound levels from measurement locations with higher sound levels were calculated to not cause sound levels above the residential receiver objectives when they were solely CM7 sources. The main contributors to sound levels around CM7, as identified also in previous surveys, include CM6 western wall fan and doorway emissions, Kiln 6 and the PHT, rail unloading operations at the bin north of CM7 and site truck movements.

Based on these results, indicating internal sound levels have not increased since 2017, external sound levels in many locations have also not increased and locations where external sound levels have increased are significantly influenced by other external sources, it is considered that the No.7 Cement Mill Project is in compliance with the sound level objectives of its conditions of approval.

A number of locations had higher sound levels which could potentially be reduced. The main recommendations are noted below:

- Some large roll doors were not sealed to ground level and had a gap of 50 to 100mm or more at the bottom. This leads to increased noise emission from the doorway. In some cases this is caused by a build-up of cement dust which has hardened around the bottom of the door. Maintenance to maintain a fully closed door is recommended.
- Noise emissions from fan discharges in CM6 western wall, CM5 western wall (FA502) and CM5 annex northern wall fan discharge (DC702) add to the emissions from CM7 and have the potential to exceed objectives at residential receivers. This was also identified in 2018. It is recommended that a review be made of these fans and the condition of their associated silencers where present, to determine how reductions in emissions can be achieved.

No.6 Cement Mill

Sound levels were also measured around Cement Mill No.6 for comparison with previous measurements and the results are also shown in Tables 3.5 to 3.7, for locations shown in Figures 3.cc to 3.dd. Spectra are shown in Figures A49 to A53 in Appendix A. Sound levels had increased at 9 of 26 locations, mostly from open doorways.

The large roll doors along the eastern side of the CM6 building adjacent to the mill and drive rooms were open for 500mm to 1m from the ground during the measurements and this caused higher sound levels along the eastern side locations compared to some previous measurements. Sound levels on the western side of the building were also higher because the large door at the north-western corner was open. Sound levels at other locations remote from open doors were similar to those of previous years.

Sound spectrum levels along the south-eastern side of CM6 are shown in Figure A51. The spectrum at location 13 adjacent to the southern doorway on the eastern side of the building, which was open for 1m, had a tonal peak at 315 Hz. There was also a tonal peak at 1250 Hz in the spectrum from location 18 adjacent to the compressor room door. This is likely to be from the compressor. Noise from this is significantly reduced by directivity and building barriers in propagating to residential receivers and would not be audible.

Sound spectrum levels at other eastern side locations were broad-band and non-tonal, as shown in the spectral and tonality figures.

Table 3.8 provides a calculation of contribution sound levels for all locations with increased sound levels in 2019 compared to 2010 to 2018, and shows that even if the noise was coming from the CM6 building at the measurement location, the contribution at residential receivers is well below the objective.

For location 25, 11m north of CM6 building, the sound level was 5 dB higher than in 2017. The calculated contribution at residences shown in Table 3.8 was 1 dB above the objective for 72 Taylor Avenue and within 1 dB of the objective for Brisbane St and Melbourne St. Sound levels at this location are also influenced by other site sources such as rail activities and conveyors and these were occurring during the measurements. It is considered that sound levels from Cement Mill No. 6 are likely to have not increased significantly such that increased total sound levels from the plant are received at residential locations. Sound level spectra are also considered to be acceptable at residential receiver locations.

It is recommended that the large doors – roll doors on both sides of the building and wall openings on the northern side of the building, be kept closed during normal operations. Improved sealing around these doors is recommended; this can be by:

- cleaning the bottom seal area of the roll doors so they close all the way to the ground;
- cleaning the bottom seal area of the man-doors so they are able to be closed against the door jamb seals; and,
- adding sound barrier insulation strips around the edges of the wall doors on Level 1. This could be 300mm wide strips of flexible loaded vinyl material such as 8kg/m² 4mm thick Wavebar[®] or similar material, so that the strips overlap the wall edges.



Figure 3.1: Boral Cement Berrima Annual Environmental Noise 2019 - Kiln 6 survey area

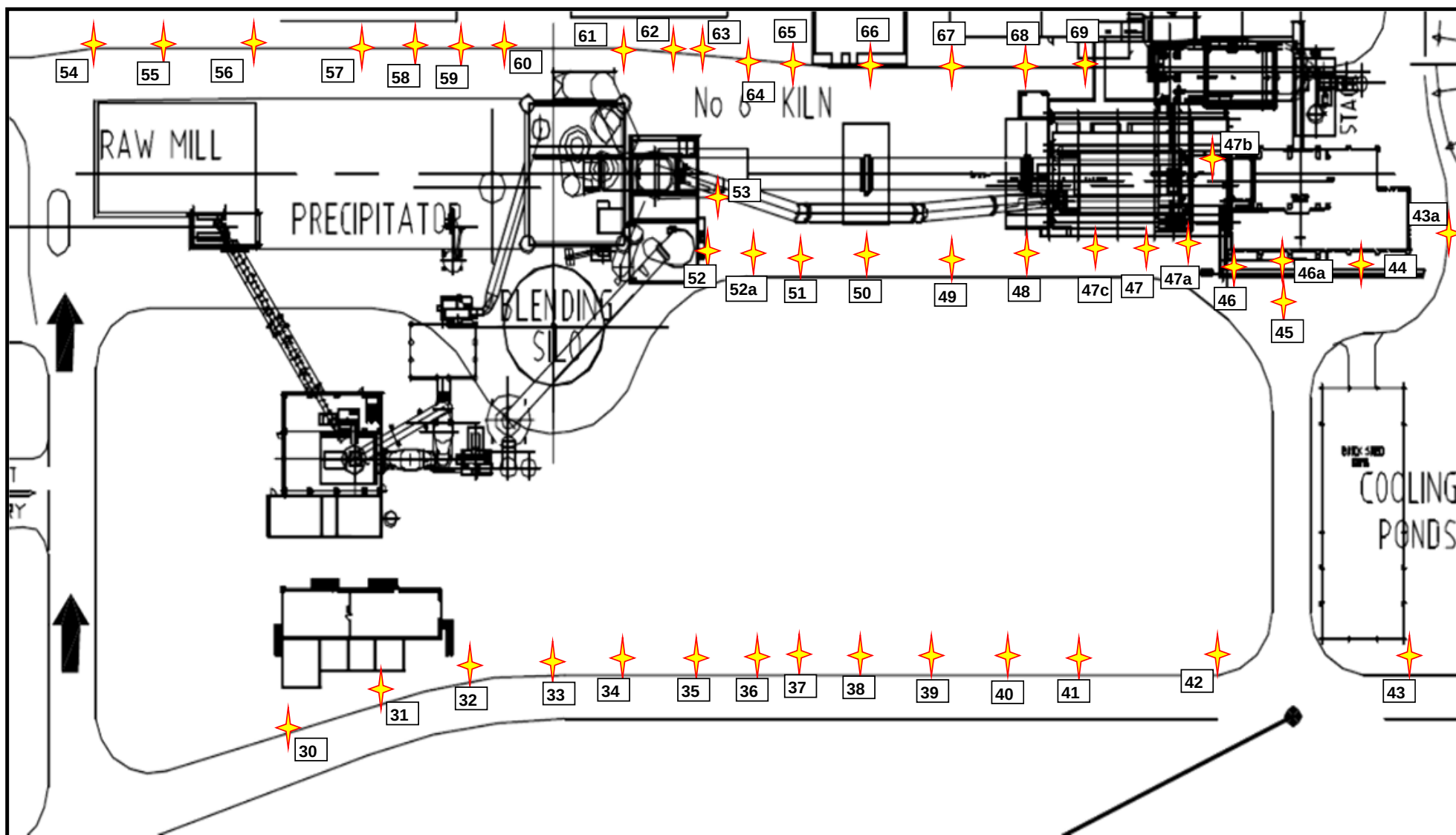


Figure 3.2: Boral Cement Berrima - Noise Assessment - Measurement locations plan for Kiln 6 & RM7

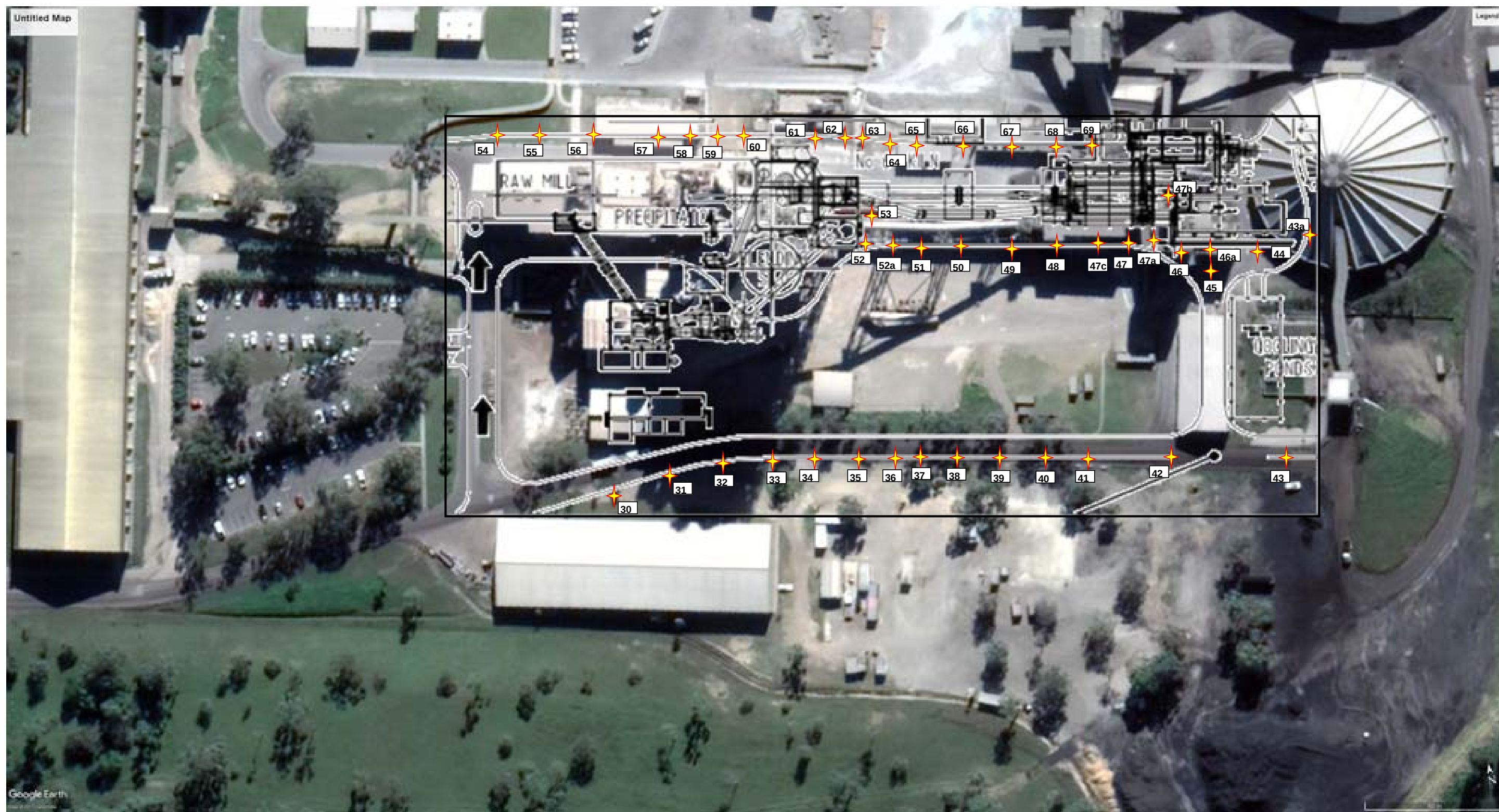
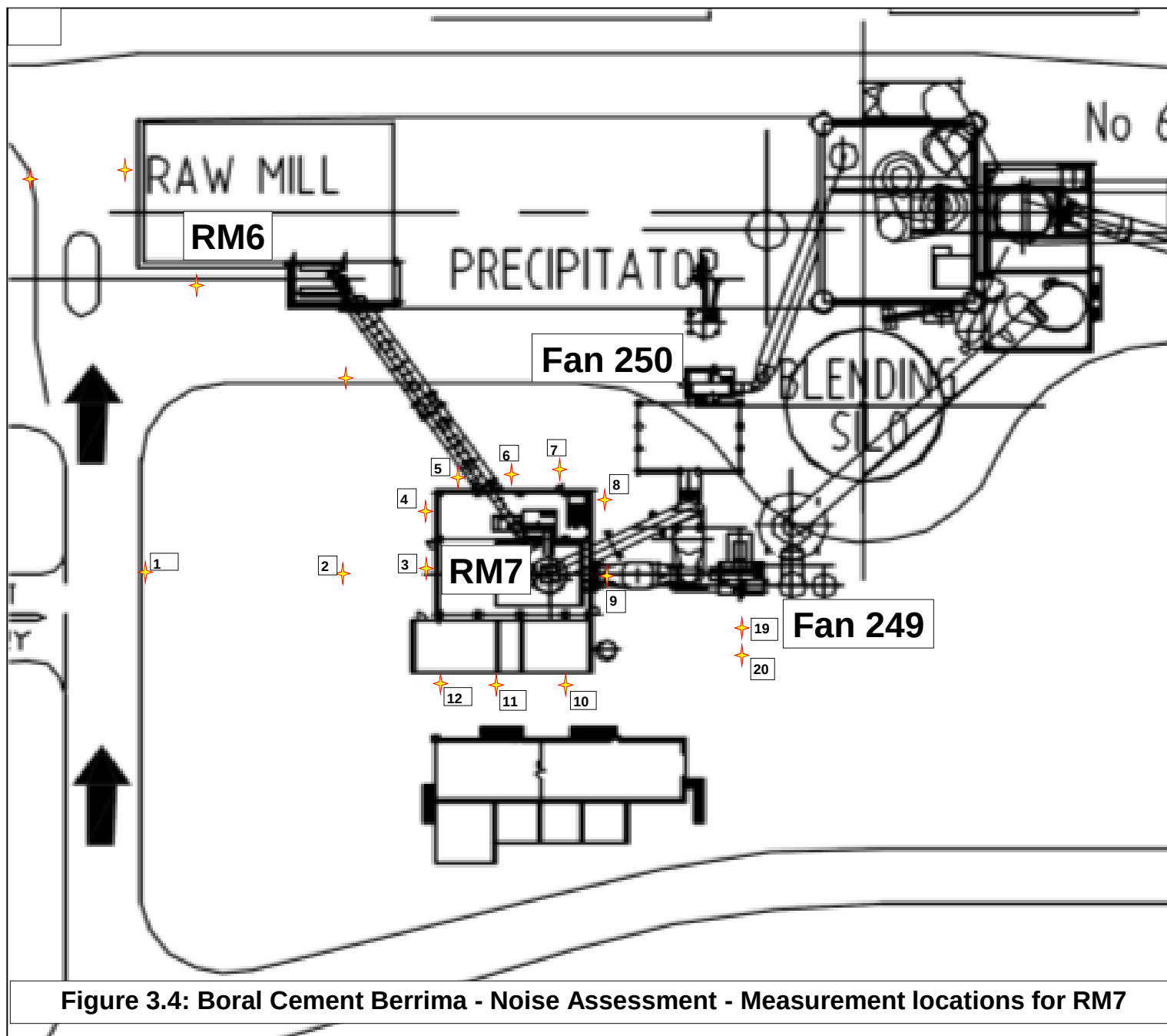


Figure 3.3: Boral Cement Berrima - Kiln 6 Layout and measurement locations with aerial overlay



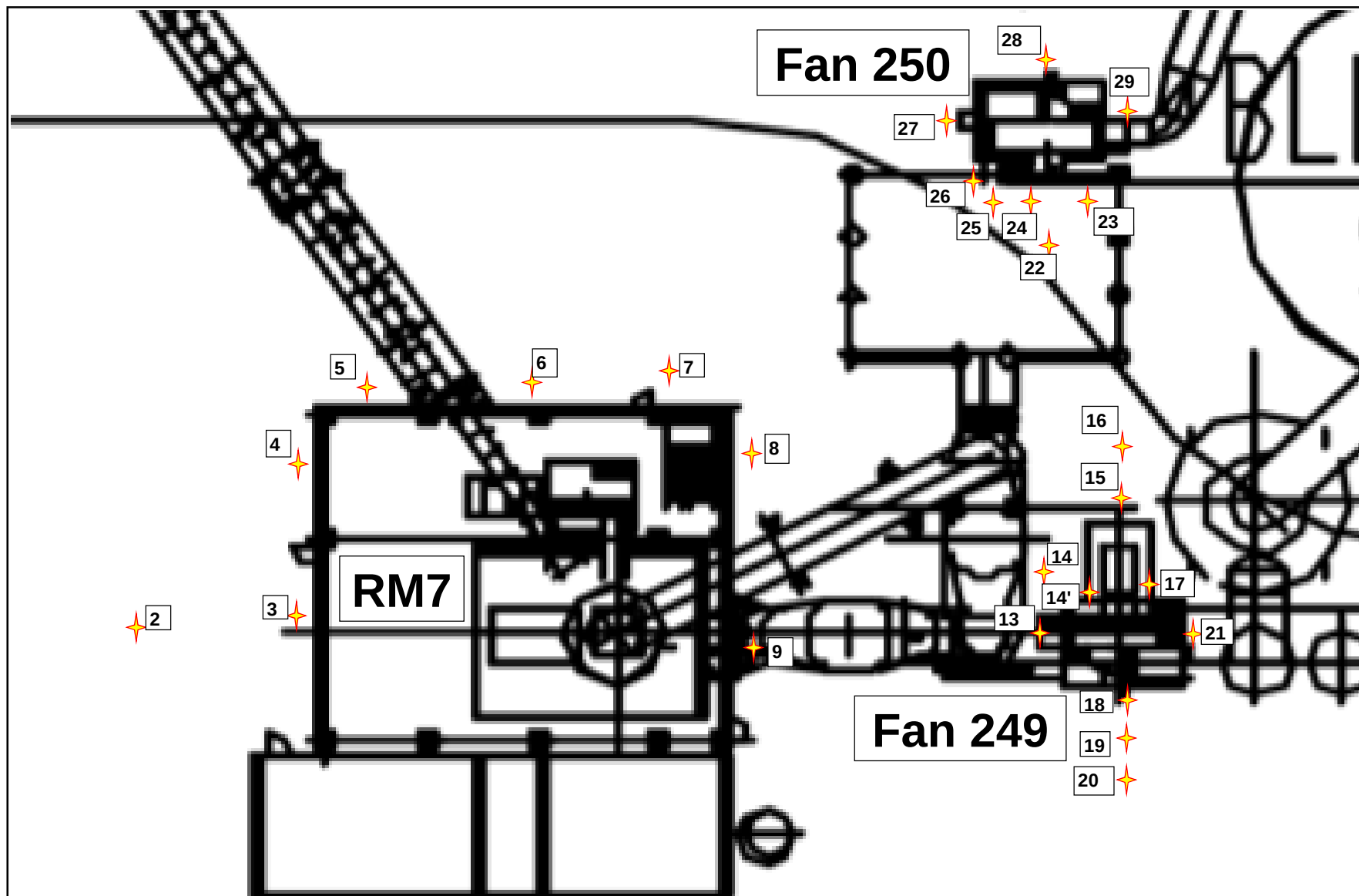


Figure 3.5: Boral Cement Berrima - Noise Assessment - Measurement locations RM7 & FA249 & FA250

Table 3.1: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Kiln 6 Upgrade

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
PHT Level 8	PHT L8 Top platform level with top of stack	202	10/09/2019	10:57 AM	30	76	89	78	78	75	13	
	PHT L8 Top platform EL16 Gbox @ 1m to coupling NW side	203	10/09/2019	10:58 AM	30	79	90	81	80	78	11	
	PHT L8 Top platform EL16 Gbox @ 1m to coupling SW side	204	10/09/2019	10:59 AM	40	78	89	80	79	77	11	
	PHT L8 Top platform EL16 Gbox @ 2m to motor S side	205	10/09/2019	11:00 AM	31	78	92	79	79	77	14	
	PHT L8 Top platform EL16 Gbox @ 1m to NE side	206	10/09/2019	11:01 AM	30	78	90	79	79	78	12	
	PHT L8 Lower platform	207	10/09/2019	11:07 AM	30	74	88	76	75	73	14	
	PHT L8 Top platform EL16 Gbox @ 3m to N side	208	10/09/2019	11:07 AM	30	75	87	76	76	75	12	
	PHT L8 proper FA263 motor & casing @ 1m	209	10/09/2019	11:09 AM	30	88	92	90	89	88	4	
	PHT L8 proper 1m to vent on FA263 filter room	210	10/09/2019	11:10 AM	30	77	88	78	78	77	11	
	PHT L8 centre tower W side	211	10/09/2019	11:11 AM	30	74	86	75	75	73	12	
	L8 new PHT centre	212	10/09/2019	11:12 AM	32	72	84	74	74	72	11	
	PHT L8 centre tower N side	213	10/09/2019	11:13 AM	38	72	84	73	73	72	12	
	PHT L8 centre tower E side	214	10/09/2019	11:14 AM	31	72	84	73	73	72	12	
	PHT L8 centre tower S side	215	10/09/2019	11:15 AM	36	67	82	68	68	67	15	
PHT Level 7	PHT L7 New S side centre	216	10/09/2019	11:17 AM	42	70	81	71	70	69	12	Is under S side Alt fuels bin
	PHT L7 New E side centre	217	10/09/2019	11:18 AM	34	71	82	72	72	71	11	
	PHT L7 New N side centre	218	10/09/2019	11:19 AM	30	72	84	74	74	72	12	
PHT L7 Alt Fuels Platform L1	PHT L7 Alt Fuels Platform L1: E side of feeder @ 1m	220	10/09/2019	11:22 AM	31	72	82	74	73	72	10	
	PHT L7 New E side 4m to base of Alt Fuel chute, 1m to bin W	219	10/09/2019	11:20 AM	31	71	83	73	72	71	12	
	PHT L7 Alt Fuels Platform L1: E side of mixer @ 1m	221	10/09/2019	11:23 AM	31	73	82	74	73	72	10	
	PHT L7 Alt Fuels Platform L2: N side of conveyor discharge	222	10/09/2019	11:24 AM	42	74	85	75	74	73	11	
	PHT L7 Alt Fuels Platform L2: 1m E side of chute inlet	223	10/09/2019	11:25 AM	32	73	83	74	74	72	10	
	PHT L7 Alt Fuels Platform L2: 1m E side of conveyor 3m from entry to chute	224	10/09/2019	11:26 AM	31	72	83	74	73	72	10	
	PHT L7 Alt Fuels Platform L2: 1m NW side of conveyor drive motor	225	10/09/2019	11:27 AM	42	73	84	74	74	73	11	
	PHT L7 Alt Fuels Platform L2: 1m SW side of conveyor drive gearbox	226	10/09/2019	11:28 AM	42	72	84	74	73	72	12	
PHT Level 7	PHT L7 New centre between towers faces S	227	10/09/2019	11:30 AM	30	72	85	74	73	72	13	
	L7 between PHTs centre facing W	228	10/09/2019	11:30 AM	31	72	85	73	73	71	13	
	PHT L7 Old S side centre	229	10/09/2019	11:31 AM	30	74	86	75	75	73	12	Faces N 1m to Elevator New Gearbox
	PHT L7 under EL13 platform E side	230	10/09/2019	11:32 AM	40	75	89	76	76	74	14	
	EL13 platform E side Gbox & coupling @ 0.5m	231	10/09/2019	11:33 AM	30	82	90	83	83	82	7	
	EL13 platform N side GB end & side EL @ 1m	232	10/09/2019	11:34 AM	30	77	88	79	78	76	11	
	L7 BE drive platform N side @ 1m to BE	233	10/09/2019	11:35 AM	29	74	87	76	75	73	13	
	EL13 platform SW side motor & EL & coupling @ 1m	234	10/09/2019	11:36 AM	33	81	90	83	83	80	9	
	EL13 platform W side 0.5m	235	10/09/2019	11:37 AM	39	77	90	80	80	76	13	
	EL13 platform motor end @ 0.6m	236	10/09/2019	11:38 AM	23	85	91	86	85	84	7	
	L7 centre between cylinders	237	10/09/2019	11:39 AM	30	73	88	75	74	72	15	
	PHT L7 old NW corner 1.5m to stack	238	10/09/2019	11:40 AM	36	72	87	74	73	71	16	
	PHT L7 old centre N side	239	10/09/2019	11:41 AM	33	73	89	76	75	72	16	
	PHT L7 old centre N side on new platform	240	10/09/2019	11:41 AM	30	71	87	74	73	70	16	
	PHT Level 7: FA213 @ 1m, door open	241	10/09/2019	11:43 AM	30	81	90	82	82	80	9	
PHT Level 6 RM Silo Top	PHT L6 RM silo above baghouse discharge @ 2m at base of stairs to EL	242	10/09/2019	11:45 AM	43	79	89	81	80	79	10	
	PHT L6 RM silo Top FA260 NE side @ 1m casing & motor	243	10/09/2019	11:47 AM	30	86	92	88	87	86	5	
	PHT L6 RM Silo top EL15 platform motor side 0.6m	244	10/09/2019	11:49 AM	36	80	88	81	81	79	9	
	EL15 W side @ 1m	245	10/09/2019	11:49 AM	30	73	86	74	73	72	13	
	L6 RM silo top on BE EL15 platform SW side @ 0.8m	246	10/09/2019	11:50 AM	30	70	84	71	71	69	15	
	EL15 S side Gbox @ 1m	247	10/09/2019	11:51 AM	32	77	87	78	78	76	10	
	EL15 E side Gbox @ 0.5m	248	10/09/2019	11:51 AM	30	79	87	81	81	79	8	motor noise
	RM silo top baghouse fan DC30 discharge @ 1.5m	249	10/09/2019	11:52 AM	31	87	96	88	88	86	9	
	RM Silo top E side 12.7m to FA260	250	10/09/2019	11:54 AM	60	74	85	76	75	73	10	
	RM Silo top N side 12.7m to FA260	251	10/09/2019	11:55 AM	61	74	85	75	75	73	11	

Table 3.1: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Kiln 6 Upgrade

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
PHT Level 6	PHT L6 centre W side	252	10/09/2019	11:57 AM	31	73	83	76	75	73	10	
	PHT L6 stack test port 100mm diam @ 200mm	253	10/09/2019	11:58 AM	30	87	96	90	89	86	9	
	PHT L6 stack test port 100mm diam @ 200mm	254	10/09/2019	11:59 AM	20	87	96	90	89	86	8	
	PHT L6 NW corner 1m to stack	255	10/09/2019	12:02 PM	30	77	86	80	79	77	9	sampler on
	PHT L6 centre N side by platform	256	10/09/2019	12:03 PM	30	72	83	74	73	72	11	
	PHT L6 centre N side on platform	257	10/09/2019	12:04 PM	33	73	83	76	73	72	11	
	PHT L6 centre between towers	258	10/09/2019	12:05 PM	31	72	82	76	74	72	10	
	PHT L6 new N side centre	259	10/09/2019	12:06 PM	32	73	83	75	74	73	10	
	PHT L6 new E side centre	260	10/09/2019	12:07 PM	43	73	82	74	73	72	9	
	PHT L6 new S side centre	261	10/09/2019	12:08 PM	32	74	83	84	83	73	9	
	L6 centre S side old PHT by elevator	262	10/09/2019	12:10 PM	43	73	82	78	75	72	9	
	L6 inside doorway to top RM silo room	263	10/09/2019	12:11 PM	31	81	89	82	81	80	9	at outer edge
PHT Level 6 Inside Silo Top	RM Silo top inside centre	264	10/09/2019	12:12 PM	36	82	91	84	83	81	9	on walkway
	RM silo top inside E doors open	265	10/09/2019	12:13 PM	30	80	90	82	81	80	10	
	L6 RM silo top room inside S man door	266	10/09/2019	12:14 PM	42	81	91	83	82	81	10	
	RM silo top outside S man door	267	10/09/2019	12:15 PM	31	73	84	75	75	73	11	
PHT Level 5	PHT Level 5 old centre S side by stairs	268	10/09/2019	12:18 PM	32	75	82	77	76	74	8	
	PHT Level 5 old centre W side by gas valves @ 1m	269	10/09/2019	12:19 PM	30	79	84	80	80	79	5	
	PHT Level 5 old NW corner @ 1m to stack	270	10/09/2019	12:19 PM	30	74	84	75	75	74	11	
	PHT Level 5 old centre N side	271	10/09/2019	12:20 PM	30	74	84	75	75	74	10	Face S
	PHT Level 5 centre between towers	272	10/09/2019	12:21 PM	30	73	82	74	74	72	9	
	PHT Level 5 New centre N side	273	10/09/2019	12:22 PM	30	74	82	75	75	74	8	Face S
	PHT Level 5 New centre E side above kiln	274	10/09/2019	12:23 PM	30	74	82	76	75	74	8	Face W
	PHT Level 5 New centre S side	275	10/09/2019	12:24 PM	44	73	81	74	73	72	9	Face N
PHT Level 4	PHT Level 4 old centre S side by stairs	276	10/09/2019	12:27 PM	42	82	88	99	95	77	6	Air blaster discharge to 105 @8m
	PHT Level 4 old SW corner by water pumps SV09 @ 1m N	277	10/09/2019	12:29 PM	31	80	87	93	90	79	6	Air blaster to 92
	PHT Level 4 old centre W side	278	10/09/2019	12:29 PM	31	77	87	79	78	77	10	Face E L4 Door #66
	PHT Level 4 old NW corner @ 1.2m to stack	279	10/09/2019	12:30 PM	31	75	86	76	76	74	12	
	PHT Level 4 old centre N side	280	10/09/2019	12:31 PM	31	75	85	87	85	74	10	air blaster 87
	PHT Level 4 centre between towers by air cannon @ 2m	281	10/09/2019	12:32 PM	31	77	86	81	78	76	9	
	PHT Level 4 new centre N side	282	10/09/2019	12:33 PM	31	75	84	78	77	75	9	
	PHT Level 4 new centre E side above kiln	283	10/09/2019	12:34 PM	30	74	84	78	76	74	10	
	PHT Level 4 new centre S side	284	10/09/2019	12:34 PM	47	76	84	94	88	73	7	Air blaster 93
ESP	ESP Centre E side top walkway looking E to PHT	285	10/09/2019	12:37 PM	31	75	85	78	77	74	10	
	ESP top SE corner at barrier	286	10/09/2019	12:38 PM	30	75	85	79	78	74	10	Dry screw-conveyor squeal
	ESP top SE corner at barrier - facing ESP	287	10/09/2019	12:38 PM	30	72	83	74	74	71	11	
	ESP top centre E side S platform facing PHT	288	10/09/2019	12:39 PM	30	75	85	78	77	74	10	
	ESP top NE corner at barrier	289	10/09/2019	12:41 PM	31	73	86	75	75	73	12	
	ESP top NE corner at barrier - facing west	290	10/09/2019	12:42 PM	30	71	83	74	73	71	12	
PHT Level 3	L3 old PHT centre S side @ 2m to edge facing centre	291	10/09/2019	12:44 PM	32	79	89	82	82	78	10	Dry screw-conveyor squeal
	PHT Level 3 old centre W side above FA39	292	10/09/2019	12:45 PM	34	79	90	81	80	78	12	
	PHT Level 3 old centre N side	293	10/09/2019	12:46 PM	31	78	89	79	79	78	11	
	PHT Level 3 old centre E side above kiln	294	10/09/2019	12:47 PM	32	79	89	80	80	79	9	
	PHT Level 3 old NW corner by stack @ 1.5m, above FA39 inlet	295	10/09/2019	12:48 PM	33	80	91	82	81	79	12	
PHT Level 2	PHT Level 2.5 by DC31 drives @ 0.6m	296	10/09/2019	12:50 PM	33	88	102	89	89	87	14	
	PHT Level 2.5 by DC31 discharge @ 1m	297	10/09/2019	12:51 PM	33	88	104	90	89	88	16	
	PHT Level 2.25 by centre by kiln entry	298	10/09/2019	12:52 PM	42	88	96	108	100	82	8	Air blaster 105
	PHT Level 2.25 North Side centre	299	10/09/2019	12:53 PM	30	84	96	100	93	81	13	Air blaster 82
	PHT Level 2.25 by Radicon Gbox drive E end @ 2.5m	300	10/09/2019	12:55 PM	31	87	94	96	92	85	7	
	L2.25 PHT centre W side facing fan discharge DC70 FA63 @ 4.66m, stack @ 6.35m and stack entry duct @ 6.23m	301	10/09/2019	12:56 PM	51	88	105	93	92	87	17	Strong tone 63 Hz
	L2 PHT FA03 casing @ 1m E side	303	10/09/2019	1:00 PM	30	85	96	87	87	84	11	
	PHT Level 2 by E side drive coupling & casing DC70 FA63 centre N side	302	10/09/2019	12:57 PM	40	86	96	88	87	85	11	
	PHT Level 2 FA63 discharge @ 1.5m	305	10/09/2019	1:02 PM	29	89	105	92	91	88	16	
	PHT Level 2 @ 1m to south side FA39 stack entry duct	306	10/09/2019	1:03 PM	31	87	102	90	89	86	15	
	PHT Level 2 FA65 inlet filter @ 1m in front	307	10/09/2019	1:04 PM	31	87	100	90	89	87	13	
	PHT Level 2 FA65 rear side 1m	308	10/09/2019	1:04 PM	42	87	104	90	89	86	17	
	L2 PHT centre N side edge @ 2m facing centre	304	10/09/2019	1:01 PM	32	83	96	85	84	82	13	
	PHT Level 2 @ 1m to north side FA39 stack entry duct	309	10/09/2019	1:06 PM	49	86	99	89	87	85	13	

Table 3.1: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Kiln 6 Upgrade

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
PHT Level 1	PHT Level 1 RM silo base blower room N side man door @ 1m	310	10/09/2019	1:08 PM	31	81	93	83	82	81	11	
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m NW side	311	10/09/2019	1:09 PM	39	83	95	84	84	82	13	
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m E side	312	10/09/2019	1:09 PM	38	83	94	84	83	82	11	
	PHT Level 1 FA92 silo vent fan inlet duct @ 1m SE side	313	10/09/2019	1:10 PM	31	80	92	81	81	80	12	
	PHT Level 1 FA92 silo vent fan inlet front @ 1m	314	10/09/2019	1:11 PM	30	80	95	81	81	80	15	
FA39	FA39 E side at concrete line 5.4m to motor	315	10/09/2019	2:04 PM	32	83	93	85	84	83	10	
	FA39 E side @2.3m in line with columns	316	10/09/2019	2:05 PM	31	84	95	85	85	84	11	
	FA39 under discharge duct @ 1m	317	10/09/2019	2:06 PM	32	85	99	88	87	84	14	
	FA39 E side motor platform @ 0.82m to coupling cover	318	10/09/2019	2:07 PM	31	91	97	92	92	91	6	portable cooling fan at location
	FA39 motor platform centre E side@ 1m	319	10/09/2019	2:08 PM	31	90	96	91	91	89	6	
	FA39 motor N end @ 2.7 to end plates/stop button	320	10/09/2019	2:09 PM	68	80	91	83	81	79	12	at line in concrete
	FA 39 N side on kerb	321	10/09/2019	2:10 PM	31	79	89	80	80	78	10	
	FA39 W side at metal strip 5.25m to motor	322	10/09/2019	2:11 PM	31	84	92	87	86	84	8	
	FA39 W side at columns @2.7m to plinth	323	10/09/2019	2:12 PM	31	87	94	89	88	87	7	
	FA39 W side motor platform at 0.8m to coupling cover & 1m to coupling	324	10/09/2019	2:13 PM	30	90	98	91	91	90	8	
	FA39 W side @ 1m to cladding door open, 1.33m to casing	325	10/09/2019	2:14 PM	31	86	97	88	88	85	11	
	FA39 S side @ columns 2.7m to bearing	326	10/09/2019	2:15 PM	31	87	96	90	89	86	9	Screw conveyor noise
	FA39 S side platform bearing cover @ 0.8m	327	10/09/2019	2:16 PM	32	88	96	91	90	87	8	Screw conveyor noise
	Centre between FA38 & FA39 @ 11.2m facing E	328	10/09/2019	2:17 PM	56	83	91	85	85	83	7	
	Centre between FA38 & FA39 @ 7.7 m facing FA 38	329	10/09/2019	2:18 PM	31	82	90	84	83	80	9	
FA38	FA38 @ 3.9m to E side	330	10/09/2019	2:20 PM	31	82	90	84	84	81	8	
	FA38 @ 3m to N side	331	10/09/2019	2:21 PM	61	82	91	84	83	81	9	
	FA38 @ 5m to NW side at NW column	332	10/09/2019	2:23 PM	34	81	89	83	83	81	8	
	FA38 @ 5m to NW side at W column	333	10/09/2019	2:24 PM	31	81	89	84	83	80	8	
	In centre opening of wall on W side	334	10/09/2019	2:25 PM	39	81	89	83	82	80	8	
	FA38 motor platform W side @ 1m to coupling cover, 1.9m to casing, 0.7m to motor side	335	10/09/2019	2:25 PM	31	88	92	89	89	87	4	
	FA38 at opening on S side of road facing FA38 opening	336	10/09/2019	2:27 PM	31	78	87	81	79	77	9	
	56' Road kerb N side opp. Opening to FA38	337	10/09/2019	2:28 PM	33	75	86	76	76	75	11	
	57 Road N side opp FA38 doorway	338	10/09/2019	2:28 PM	31	77	88	78	77	76	11	
	58 Road N side between FA38 & FA39	339	10/09/2019	2:29 PM	31	77	88	78	78	76	11	Opposite big columns
RM6	1 RM6 W door @ 1m	340	10/09/2019	2:31 PM	31	78	83	81	80	77	5	new door closed
	1' RM6 W door at kerb W side @ 13.3m	341	10/09/2019	2:32 PM	31	70	79	73	72	70	9	RM7 Off, new door closed
RM7	1 RM7 at roadside kerb ~32m	474	2/10/2019	9:42 AM	56	67	80	69	69	67	13	Noise from feed conveyor from RM6 to RM7 & vacuum truck @ E end RM6 - 2/10/2019 RM6 Off
	2 Rm7 @ 15.5m to W door	475	2/10/2019	9:44 AM	82	72	83	76	74	72	11	at E end of container - vacuum truck noise
	3 RM7 W wall door @ 1m	476	2/10/2019	9:45 AM	37	78	86	80	80	78	7	Door open 40mm at bottom
	4 RM7 NE corner wall vents 2 1m	477	2/10/2019	9:47 AM	30	80	88	86	83	79	8	
	5 RM7 N side NW roll door @ 1m	478	2/10/2019	9:47 AM	33	80	90	82	81	79	10	Noise from Vacuum truck behind
	6 RM7 N wall vents centre next to Roll door	479	2/10/2019	9:49 AM	30	82	90	84	84	81	8	
	RM7 vents N wall W of man door	480	2/10/2019	9:50 AM	31	83	92	86	85	82	9	
	7 RM7 N wall man door	481	2/10/2019	9:50 AM	30	80	90	83	82	79	10	
	8 RM7 E wall vents NE corner @ 1m	482	2/10/2019	9:51 AM	38	83	90	86	85	82	7	Noise from screw conveyor in RM7 baghouse behind
	9 RM7 E side under duct	483	2/10/2019	9:52 AM	30	81	88	83	83	79	7	
	10 RM7 By E door RM7 floor	484	2/10/2019	9:53 AM	30	78	87	80	79	76	10	
	10 RM7 By E door Hydraulics room open	485	2/10/2019	9:55 AM	51	73	83	88	82	72	10	Compressor purge
	11 RM7 Centre Compressor room door @ 1m closed	486	2/10/2019	9:56 AM	67	72	83	75	73	72	11	
	11A RM7 compressor room W door @ 1m closed	487	2/10/2019	9:57 AM	38	71	82	73	72	71	11	
	12 RM7 Under E inlet for switchroom fan	488	2/10/2019	9:58 AM	30	84	93	87	86	83	9	
	12B Under switchroom fan duct W	489	2/10/2019	9:59 AM	35	78	87	80	79	77	9	
	12 RM7 E inlet for switchroom fan @ 1m to N side and 0.6m below	490	2/10/2019	10:00 AM	28	77	86	78	77	76	9	

Table 3.1: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Kiln 6 Upgrade

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
FA249	13 FA249 under inlet duct W side	491	2/10/2019	10:01 AM	42	81	91	85	84	80	10	Noise from screw conveyor to North
	14 FA249 2m W side ground level	492	2/10/2019	10:03 AM	32	84	93	87	86	83	9	Noise from screw conveyor to North
	14' FA249 motor platform fan coupling & casing W side @ 1m	493	2/10/2019	10:04 AM	30	82	91	85	85	81	9	Noise from screw conveyor to North
	15 FA249 1m motor end	494	2/10/2019	10:05 AM	31	84	94	86	86	82	10	Noise from screw conveyor to North
	16 FA249 end at column 4.3m N of motor plinth	495	2/10/2019	10:06 AM	31	84	94	87	87	83	10	Noise from screw conveyor to North
	17 FA249 motor platform E side coupling & casing 1m	496	2/10/2019	10:07 AM	33	82	91	86	85	81	9	Noise from screw conveyor to North
	18 FA249 Platform S side centre @ 1m	497	2/10/2019	10:09 AM	30	74	86	76	76	74	12	Shielded a bit from conveyor noise
	18' FA249 platform S side under discharge duct E side	498	2/10/2019	10:11 AM	31	77	87	80	79	76	9	Shielded a bit from conveyor noise
	19 FA249 S side @ 3.8m	499	2/10/2019	10:12 AM	42	72	83	74	73	71	12	At barrier
	19 FA249 S side @ 5.5m	500	2/10/2019	10:14 AM	31	73	84	76	75	73	11	At northern edge of concrete road, Screw conveyor noise
	20 FA 249 S side @ 10.9m	501	2/10/2019	10:15 AM	37	75	86	78	77	74	11	At corner in concrete road
	21 FA249 E side of fan casing ground level @ 2m	502	2/10/2019	10:16 AM	32	75	87	78	77	73	13	Screw conveyor noise
FA250	22 FA250 S side 4.2 m to motor end	503	2/10/2019	10:18 AM	52	86	93	88	88	84	7	At line in concrete. Screw conveyor noise
	22' FA250 Motor end S side @ 1m	504	2/10/2019	10:19 AM	30	84	92	86	85	83	8	At line in concrete. Screw conveyor noise
	23 FA250 E side platform coupling & casing	505	2/10/2019	10:20 AM	30	86	95	89	88	85	9	Screw conveyor noise
	23' FA250 E side centre motor @ 1m	506	2/10/2019	10:21 AM	21	84	93	86	85	83	9	
	FA250 W side motor shaft @ casing @ 1m	507	2/10/2019	10:22 AM	22	86	96	88	87	86	9	
	25 FA250 coupling & casing W side motor centre @1m	508	2/10/2019	10:23 AM	23	84	93	86	85	83	9	
	26 FA250 W side casing @ 1m & coupling @ 3m	509	2/10/2019	10:24 AM	27	83	92	85	84	82	9	
	27 FA250 W side 1m under inlet casing expansion joint	510	2/10/2019	10:25 AM	30	82	91	87	85	81	9	Also noise from Vacuum truck, screw conveyor and Gate Valve behind
	28 FA250 N side casing shaft platform @ 1m	511	2/10/2019	10:26 AM	30	84	93	92	90	83	9	Also noise from Vacuum truck, screw conveyor and Gate Valve behind
	29 FA250 E side under discharge duct @ 1.5m, at lower step of concrete	512	2/10/2019	10:28 AM	54	84	94	93	88	83	9	Also noise from Vacuum truck, screw conveyor and Gate Valve behind
RM7 Roof Platform Lower	Lower platform E side 1m to Magnete plate	513	2/10/2019	10:32 AM	30	90	92	94	93	89	2	On lower step of concrete
	Lower platform S side @ 1m to magnete plate	514	2/10/2019	10:33 AM	31	91	92	94	94	90	1	Plates need damping and covers; Vacuum truck adds to level
	Lower platform W side @ 0.9m to magnete plate	515	2/10/2019	10:34 AM	31	90	91	96	92	89	2	Been repaired since 2018. Somegaps closed
	Lower platform N side @ 1m to magnete plate	516	2/10/2019	10:35 AM	31	89	93	93	92	88	4	
	Lower platform N side @ 1m to BE casing	517	2/10/2019	10:36 AM	30	85	91	90	88	84	6	Vacuum truck noise
	Platform S of Magnete 2m to S side	518	2/10/2019	10:37 AM	29	86	90	93	90	85	3	Vacuum truck noise
	Platform S of Magnete 2m to S side	519	2/10/2019	10:38 AM	30	87	88	92	90	86	1	Vacuum truck noise lower
	Lower platform N side @ 1m to BE casing	520	2/10/2019	10:39 AM	30	85	89	92	88	84	3	Vacuum truck noise lower
RM7 Roof Platform Upper	Upper Platform Gbox @ 1m E side & 0.5m casing	521	2/10/2019	10:41 AM	30	82	91	84	84	81	9	Vacuum truck noise
	Upper Platform Gbox @ 1m N side	522	2/10/2019	10:41 AM	26	82	92	86	84	81	10	Vacuum truck noise
	Upper Platform motor end @ 1m W side	523	2/10/2019	10:42 AM	30	82	92	86	85	81	10	Vacuum truck noise
	Upper Platform BE casing @ 0.9m W side	524	2/10/2019	10:43 AM	26	82	91	87	85	80	10	
	Upper Platform BE casing @ 1m S side	525	2/10/2019	10:44 AM	30	85	90	91	88	84	5	
	Upper Platform BE casing @ 1m E side	526	2/10/2019	10:45 AM	25	82	91	85	84	81	9	Hatch cladding removed and not replaced
RM7 Baghouse tower	On tower to baghouse top S side above FA249 same level as roof RM7	527	2/10/2019	10:48 AM	25	72	83	79	77	70	11	
	On tower to baghouse top S side above FA249 top level	528	2/10/2019	10:50 AM	30	69	80	74	73	68	11	Loader operating below
	Baghouse S doorway open	529	2/10/2019	10:51 AM	60	81	84	95	93	73	3	
	Inside centre baghouse top	530	2/10/2019	10:52 AM	61	83	85	98	96	70	1	Ambient 72, pulses 88 to 95

Table 3.1: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Kiln 6 Upgrade

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
RM7 Inside	Top floor E open doorway	531	2/10/2019	10:57 AM	30	85	89	91	90	84	4	
	Centre top 2m N of BE casing	532	2/10/2019	10:58 AM	37	88	92	92	90	87	4	
	Top level 1m E side entry of conveyor to chute	533	2/10/2019	10:59 AM	30	91	94	96	94	90	2	
	Top level by top of RM7	534	2/10/2019	11:00 AM	40	92	95	98	97	90	3	
	Top level W side of chute entry end of conveyor	535	2/10/2019	11:01 AM	40	92	95	97	94	91	2	
	Top level W side of chute opening entry of conveyor	536	2/10/2019	11:02 AM	33	92	94	96	94	91	2	Just back S from chute entry
	Top level centre W side platform	537	2/10/2019	11:02 AM	38	89	92	93	92	88	3	1m from inlet N of entry W side of conveyor
	Top level in doorway of conveyor from RM6	538	2/10/2019	11:04 AM	36	86	91	89	88	85	4	
	On conveyor walkway on centre from RM6 at centre light	539	2/10/2019	11:05 AM	38	79	88	82	81	78	9	Vacuum truck below
	Level 3 2m N of BE casing	540	2/10/2019	11:06 AM	39	89	93	95	94	88	4	
	Level 3 between chute & duct on top of Mill	541	2/10/2019	11:08 AM	37	93	96	96	96	92	2	
	Level 2 2m N side of BE casing	542	2/10/2019	11:09 AM	32	90	94	94	92	89	5	
	Level 2 1m N of cone top of Mill by entry door	543	2/10/2019	11:11 AM	43	92	95	96	96	91	3	
	Level 1 2m N of BE casing is work bench	544	2/10/2019	11:12 AM	49	91	95	94	93	89	4	Vacuum truck noise
	Level 1 2m to RM7 body N side	545	2/10/2019	11:13 AM	35	92	96	98	95	91	4	Squeaks and bangs of mill to 98
	Level 1 2m W side of RM7 on platform	546	2/10/2019	11:14 AM	34	92	96	96	94	91	4	Squeaks and bangs of mill to 99
	L0 1m E side of feeder VF100 inlet chute & RM7 body	547	2/10/2019	11:16 AM	60	97	99	103	101	94	2	Inlet skirt to feeder broken, needs replacement
	L0 Ground Floor 3m N of BE casing	548	2/10/2019	11:17 AM	33	92	96	96	94	91	3	Shaker, chute and mill noise
	L0 Inside man door N side	549	2/10/2019	11:18 AM	36	92	96	95	94	91	4	
	L0 Inside W roll door @ 1m	550	2/10/2019	11:19 AM	35	91	95	93	92	90	5	
RM7 bag-house hopper area	L0 Drive motor N @ 2m to N side & 3m to mill body	551	2/10/2019	11:20 AM	37	94	98	97	96	93	4	
	L0 Drive motor S side @ 2m and RM7 body @ 2m	552	2/10/2019	11:21 AM	35	92	96	95	94	91	4	
	L0 RM7 body S side @ 2m	553	2/10/2019	11:22 AM	47	91	95	96	94	90	4	
	L0 NW corner 1.5m to roll door and vents	554	2/10/2019	11:23 AM	41	89	94	92	91	88	5	
	On screw conveyor SC212 platform Level 1 W end side by fan motor @ 1m	555	2/10/2019	11:48 AM	30	79	88	82	81	79	8	Vacuum truck adds to all measurements on baghouse area
	Centre S side of screw in line with motor FA250	556	2/10/2019	11:48 AM	39	78	89	80	80	77	11	Some conveyor squeaking
	E end of SC212 body @ 2m and other N-S aligned screw	557	2/10/2019	11:49 AM	32	78	89	83	80	77	11	Occasional screw conveyor squeaks
	Main platform of baghouse hopper screws S end chute W side between SC211 & gate valve	558	2/10/2019	11:51 AM	44	78	86	82	80	77	8	Some conveyor squeaking
	Centre W side	559	2/10/2019	11:52 AM	41	79	87	82	81	78	8	
	Centre E side - on	560	2/10/2019	11:53 AM	32	79	87	85	83	78	8	Fan FA250 below is main source
	N end Sc211 but S of duct	561	2/10/2019	11:54 AM	34	80	88	82	81	79	8	Fan FA250 below is main source
Kiln 6 South - Coal Road South Side	By FA252 @ 0.8m shaft S side, casing & discharge box	562	2/10/2019	11:56 AM	32	79	89	85	81	78	10	Fan FA250 inlet duct centre
	By FA252 @ 0.8m shaft N side, casing & inlet	563	2/10/2019	11:57 AM	30	81	92	87	84	80	12	
	Baghouse hopper platform level N end	564	2/10/2019	11:58 AM	35	78	87	85	83	77	9	Squeaks from screw conveyor to E & Vacuum truck
	Baghouse hopper centre platform	566	2/10/2019	11:59 AM	37	78	87	85	82	77	9	
	By FA252 @ 1m to side discharge box top grill	567	2/10/2019	12:02 PM	39	79	90	85	82	79	10	
	30 Coal Road S side in line W side RM7	568	2/10/2019	12:07 PM	60	66	78	69	68	65	11	Tonal reverse alarm from crane at Alt Fuels
	31 Coal Road S side in-line E side RM7	569	2/10/2019	12:09 PM	60	67	79	68	68	66	12	Tonal reverse alarm from crane at Alt Fuels
	32 Coal Road S side in-line FA249	570	2/10/2019	12:10 PM	60	69	80	71	70	68	12	Tonal reverse alarm from crane at Alt Fuels
	33 Coal Road S side Centre Blending Silo	571	2/10/2019	12:12 PM	60	70	82	72	71	69	12	Tonal reverse alarm from crane at Alt Fuels
	34 Coal Road S side E side PHT	572	2/10/2019	12:13 PM	70	70	81	82	76	69	11	Tonal reverse alarm from crane at Alt Fuelsto 80, Under Alt Fuels conveyor
	35 Coal Road S side E side new PHT	177	10/09/2019	4:10 PM	42	71	81	73	72	70	11	10/09/2019
	35 Coal Road S side E side new PHT	573	2/10/2019	12:15 PM	61	70	82	75	72	70	12	Air cannon in PHT to 72
	36 Coal Road S side E side drive platform	178	10/09/2019	4:12 PM	32	72	82	84	80	70	10	
	36 Coal Road S side E side drive platform	574	2/10/2019	12:16 PM	60	69	81	71	70	69	12	KSCFs and PHT main source
	37 Coal Road S side centre column W support duct	179	10/09/2019	4:15 PM	46	70	81	72	71	69	11	
	37 Coal Road S side centre column W support duct	575	2/10/2019	12:18 PM	60	69	82	73	70	68	13	KSCFs and PHT main source
	38 Coal Road S side centre pedestal	180	10/09/2019	4:17 PM	52	70	81	73	71	69	11	
	38 Coal Road S side centre pedestal	576	2/10/2019	12:19 PM	63	69	81	70	70	68	12	Wind 3 to 4 m/s W
	39 Coal Road S side Between centre & E pedestal	181	10/09/2019	4:18 PM	34	70	81	71	71	70	11	
	39 Coal Road S side Between centre & E pedestal	577	2/10/2019	12:20 PM	60	69	80	71	70	69	11	In line with W side compressor building
	40 Coal Road S side E pedestal	182	10/09/2019	4:19 PM	48	70	80	71	71	69	11	
	40 Coal Road S side E pedestal	578	2/10/2019	12:22 PM	60	69	80	71	70	69	11	

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Kiln 6 South - Coal Road South Side	41 Coal Road S side W end Firing floor building	579	2/10/2019	12:23 PM	60	68	79	69	68	67	11	
	41 Coal Road S side W end Firing floor building	183	10/09/2019	4:21 PM	43	69	80	74	71	68	11	
	42 Coal Road S side opposite grate	186	10/09/2019	4:27 PM	32	68	79	69	69	68	10	South side of Road
	42 Coal Road S side opposite grate	580	2/10/2019	12:24 PM	64	68	78	77	70	67	10	Ignore the maximum - hammer drop to ground nearby
	43 Coal Road S side W side coal receival bin 25m to truck	185	10/09/2019	4:25 PM	41	71	79	74	74	69	8	Coal Conveyor working
	43 Coal Road S side W side coal receival bin 25m to truck	581	2/10/2019	12:27 PM	68	62	75	66	65	62	13	No truck, 63. Fan at CM building audible. Air cannon is Maximum
	42' Coal Road N side opposite grate	184	10/09/2019	4:23 PM	61	69	80	71	70	69	11	North side of Road
Old Fenceline South	Former Gate site opp W end Firing floor	582	2/10/2019	12:31 PM	60	57	74	60	59	56	17	Rec. C 90 TAS 762 & Store 583
	Top N edge of bank opposite centre pedestal	584	2/10/2019	12:36 PM	61	59	73	62	61	58	14	
	Top N edge of bank 21m S of centre Alt Fuels Building	585	2/10/2019	12:38 PM	69	51	68	58	54	50	17	Alt Fuels building shields PHT noise
	Top N edge bank Opposite E side old PHT	586	2/10/2019	12:40 PM	60	60	73	65	61	59	13	
	Bottom N edge of bank 13m S of centre Alt Fuels Building	587	2/10/2019	12:41 PM	63	50	67	63	54	49	17	
K6 S side	43A Kerb E side CM opp CM fan discharge	404	10/09/2019	3:44 PM	38	77	84	79	78	76	7	
	44A Under Coal Mill fan discharge	405	10/09/2019	3:45 PM	32	88	95	90	89	88	6	
	44 CM fan room roll door @ 2m	406	10/09/2019	3:46 PM	31	84	92	85	85	84	8	Door open at bottom 50mm
	44 CM fan room roll door @ 2m	407	10/09/2019	3:47 PM	36	82	89	83	83	82	7	Door closed at bottom
	44' CM S wall E door @1m,	408	10/09/2019	3:48 PM	33	88	92	89	89	87	4	
	45 CM S roll door and wall vent @ 9.9m S side	409	10/09/2019	3:49 PM	35	80	86	81	80	79	7	
	46 CM room wall vent @ 2m	410	10/09/2019	3:50 PM	32	84	90	85	85	84	6	
	46A Coal Mill Room S roll door W @ 1m	411	10/09/2019	3:52 PM	38	84	89	85	85	83	5	
	47B Centre between Grate & CM blower room roll door	412	10/09/2019	3:53 PM	31	87	93	88	87	86	7	
	47A Centre between CM Room and grate	413	10/09/2019	3:54 PM	30	80	88	81	81	80	8	At line with kerb
	47 Opp FA264 @ 8m	414	10/09/2019	3:55 PM	32	81	89	81	81	80	9	
	47C Between FA264 & FA200	415	10/09/2019	3:55 PM	31	81	90	82	82	81	9	
	47D FA 200 S Side @ 5m	416	10/09/2019	3:56 PM	31	83	91	85	84	83	8	
	48 Opp. E pedestal roller	417	10/09/2019	3:57 PM	31	83	92	84	84	83	8	
	49 Half way between centre & E pedestals	418	10/09/2019	3:58 PM	31	84	91	85	85	84	7	
	50 Opp. Centre pedestal	419	10/09/2019	3:59 PM	32	82	89	83	82	81	7	Most of the KSCF's on this side are off
	51 Half way between Centre & Western pedestals, by duct support trestle	420	10/09/2019	4:00 PM	34	81	88	82	81	80	7	
	52A Opp E end of kiln drive platform	421	10/09/2019	4:00 PM	32	81	88	82	82	81	7	
	52 Opp W pedestal roller	422	10/09/2019	4:01 PM	32	82	89	84	83	82	7	
	53 Kiln drive platform Centre E end on platform (ground level)	423	10/09/2019	4:10 PM	32	85	92	86	86	85	7	
Kiln Drive platform	S side S motor end @ 1.5m kiln drive	424	10/09/2019	4:11 PM	32	84	92	85	85	84	8	
	S side of S Gbox @ 1.5m	425	10/09/2019	4:12 PM	31	85	92	86	85	84	7	
	E side of S drive motor @ 1.5m, 2m to Gbox	426	10/09/2019	4:13 PM	31	86	94	87	87	86	8	
	53 Kiln drive platform Centre E end on platform between motors	427	10/09/2019	4:14 PM	31	88	96	90	89	88	8	
	53 Kiln drive platform Centre E end on platform between gearboxes	428	10/09/2019	4:14 PM	32	86	94	87	87	86	8	
	N side motor end @ 1m kiln drive	429	10/09/2019	4:15 PM	29	85	95	86	86	85	10	Cooling fan discharge @ 1.5m
	N side motor N end @ 1.5m kiln drive	430	10/09/2019	4:16 PM	32	85	93	86	86	84	8	
	N side of N drive & Gbox @ 1.5m	431	10/09/2019	4:17 PM	32	86	93	87	87	85	7	
Kiln 6 road Northern side	54 W end RM6	595	2/10/2019	2:59 PM	47	70	86	72	71	69	16	2/10/19 RM6 off
	54 W end RM6	342	10/09/2019	2:33 PM	100	71	82	74	72	70	11	RM6 On, RM7 Off
	55 Centre RM6	596	2/10/2019	3:00 PM	31	71	85	72	72	70	15	2/10/19 RM6 off
	55 Centre RM6	343	10/09/2019	2:36 PM	31	72	83	73	72	71	11	
	56 E End RM6	597	2/10/2019	3:01 PM	30	76	91	77	76	75	15	2/10/19 RM6 off, Vacuum truck opposite S side FA38
	56 E End RM6	344	10/09/2019	2:36 PM	31	74	85	75	75	74	11	
	56' Between RM6 & New wall for FA38	598	2/10/2019	3:02 PM	33	77	92	79	78	77	15	2/10/19 RM6 off, Vacuum truck opposite S side FA38
	56' Between RM6 & New wall for FA38	345	10/09/2019	2:37 PM	31	75	86	76	76	75	11	FA38 opening
	57 Door opp FA38	599	2/10/2019	3:03 PM	31	77	89	79	78	77	12	2/10/19 RM6 off, Vacuum truck opposite S side FA38
	57 Door opp FA38	346	10/09/2019	2:38 PM	31	77	88	78	78	77	11	
	58 Half way between FA38 & FA39, by big column	600	2/10/2019	3:04 PM	31	78	89	80	79	77	11	2/10/19 RM6 off, Vacuum truck opposite S side FA38

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						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
Kiln 6 road Northern side	58 Half way between FA38 & FA39, opposite big column	347	10/09/2019	2:39 PM	31	77	89	78	78	77	11	
	59 Opp FA39 end	601	2/10/2019	3:05 PM	38	79	90	82	81	78	11	2/10/19 RM6 off, Vacuum truck opposite S side FA38
	59 Opp FA39 end	348	10/09/2019	2:39 PM	31	78	89	79	79	78	11	
	60 Opp Conditioning Tower	349	10/09/2019	2:40 PM	36	78	90	80	79	78	11	
	60' Opp. Stack	350	10/09/2019	2:41 PM	32	79	89	80	80	79	10	KSCF noise
	64 E end drive platform	351	10/09/2019	2:44 PM	51	83	90	84	84	83	7	? Off
	65 Opp column for return duct W side	352	10/09/2019	2:45 PM	32	85	91	85	85	84	6	
	66 Opp centre pedestal	353	10/09/2019	2:46 PM	31	88	94	89	88	87	6	
	67 Half way between centre & e pedestals	354	10/09/2019	2:47 PM	31	87	94	88	87	87	7	
	68 Opp E pedestal	355	10/09/2019	2:48 PM	35	89	102	90	90	89	13	Strong tone 50 Hz
Grate Cooler Fan Courtyard	69 Centre courtyard - opposite F201	356	10/09/2019	2:49 PM	31	93	102	94	94	93	9	Strong tone 50 Hz
	69 Centre courtyard - opposite F203	357	10/09/2019	2:49 PM	30	93	103	94	93	92	11	Opposite FA203
	FA201 @ 2m	358	10/09/2019	2:50 PM	33	96	103	97	97	96	7	Tone from FA201?
	FA201 N side inlet & casing @ 1m	360	10/09/2019	2:52 PM	31	98	106	99	98	98	8	
	Between FA201 & 203 & 202	359	10/09/2019	2:51 PM	31	99	107	100	99	98	8	
	FA203 inlet & casing @ 2m	361	10/09/2019	2:53 PM	30	93	103	94	94	93	10	
	FA203,FA204 & FA205 @ 1m	362	10/09/2019	2:54 PM	33	92	102	93	93	92	10	
	Between inlet filters FA205 & FA206	363	10/09/2019	2:55 PM	32	88	98	90	89	87	11	On walkway
Grate Northern area	Centre between Grate & CM blower room roll door	364	10/09/2019	2:56 PM	32	87	95	88	87	86	9	
	Coal Mill Building N roll door @ 2m	365	10/09/2019	2:57 PM	32	86	92	87	86	85	7	Door open at bottom 100mm (note same comment last year)
Kiln Firing Floor	Centre N side opening face E	366	10/09/2019	2:59 PM	60	85	93	105	90	82	8	Air cannon 101
	Centre N side opening face W	367	10/09/2019	3:00 PM	35	83	93	84	84	83	10	
	FA209 E side inlet & filter silencer	368	10/09/2019	3:01 PM	37	87	95	94	89	86	8	Air cannon 93
	FA209 Kiln Discharge Seal Fan N inlet W side @ 1.5m	369	10/09/2019	3:02 PM	31	93	98	94	94	93	5	KSCFs
	Centre S side opening face E	370	10/09/2019	3:03 PM	61	82	91	97	86	81	9	Air cannon 94
	Centre S side opening face W	371	10/09/2019	3:04 PM	31	81	90	82	82	81	9	KSCFs shielded here
	FA210 Kiln Discharge Seal Fan S inlet @ 1.5m	372	10/09/2019	3:05 PM	31	92	95	94	93	92	3	
	FA210 S side seal fan inlet W side & casing @ 1m	373	10/09/2019	3:06 PM	44	86	93	87	87	86	7	
	FA200 inlet side @ 1.5m	374	10/09/2019	3:08 PM	32	89	98	91	91	89	9	
	New replacement FA211 centre under kiln, inlet @ 1m	375	10/09/2019	3:09 PM	41	97	103	99	98	97	6	Open inlet - needs a silencer
	Kiln floor centre E S of duct/clinker elevator	376	10/09/2019	3:11 PM	46	82	91	96	89	80	9	Air cannon 95
	KFF burner air cannon N side @ 2m	377	10/09/2019	3:12 PM	90	88	91	112	87	84	4	Air cannon 105
	KFF burner by air cannon S side @ 2m	378	10/09/2019	3:14 PM	98	85	90	101	85	84	5	Air cannon 98
Radicon Cooler	RC L1 centre fan @ 1m	379	10/09/2019	3:17 PM	31	86	93	87	87	86	7	
	RC L1 S fan @ 0.5m	380	10/09/2019	3:17 PM	30	87	93	88	87	86	6	Fans at lower speed today because of cold weather
	RC L1 N fan @ 1m	381	10/09/2019	3:18 PM	31	86	93	87	86	85	8	
	RC L2 centre fan @ 1m	382	10/09/2019	3:19 PM	36	85	92	86	86	85	7	
	RC L2 S fan @ 0.7m	383	10/09/2019	3:20 PM	32	86	92	86	86	85	7	
	RC L2 N fan @ 1m	384	10/09/2019	3:21 PM	31	85	92	86	86	85	7	
	RC L3 Centre fan @ 1m	385	10/09/2019	3:21 PM	31	85	92	86	86	85	7	
	RC L3 S fan @ 0.7m	386	10/09/2019	3:22 PM	30	85	91	86	85	84	6	
	RC L3 N fan @ 1m	387	10/09/2019	3:23 PM	31	85	91	85	85	84	6	
	RC L4 Centre fan @ 1m	388	10/09/2019	3:24 PM	32	85	92	86	86	84	7	
	RC L4 S fan @ 0.7m	389	10/09/2019	3:25 PM	39	86	92	88	87	85	6	
	RC L4 N fan @ 1m	390	10/09/2019	3:26 PM	16	82	89	83	83	81	8	off
	RC L5 face E	391	10/09/2019	3:26 PM	31	80	89	82	82	80	9	
	RC L5 face W	392	10/09/2019	3:27 PM	30	81	89	82	82	81	8	
	L1 E side 2.4m	393	10/09/2019	3:29 PM	33	77	87	79	78	76	10	
	L1 E side 6m	394	10/09/2019	3:30 PM	31	75	85	76	76	75	10	
	L1 E side 12m	395	10/09/2019	3:31 PM	31	72	83	73	73	72	11	
FA215	Motor S end @ 2.5m	396	10/09/2019	3:34 PM	31	78	87	80	79	78	9	
	Platform E side drive coupling @ casing @ 1m	397	10/09/2019	3:35 PM	30	81	86	83	83	80	5	
	W side platform @ 1m to coupling & casing	398	10/09/2019	3:36 PM	31	81	87	83	82	81	6	
	Under expansion joint discharge duct to stack @ 1m	399	10/09/2019	3:37 PM	38	75	85	76	76	74	10	
	N side inlet box platform @ 1m to discharge duct & inlet box	400	10/09/2019	3:38 PM	31	71	83	72	72	70	12	
	Platform centre N side inlet box	401	10/09/2019	3:39 PM	30	72	82	73	73	72	10	
	Under Inlet box W side entry duct	402	10/09/2019	3:39 PM	31	76	86	77	76	75	10	Noise from Coal mill Room, grate, etc
	Inlet box N side ground level @ 1m	403	10/09/2019	3:40 PM	31	73	83	74	73	72	11	
Control Building Roof	Roof SW corner opp E end RM6	432	10/09/2019	4:27 PM	120	71	80	73	73	70	8	10/09/2019
	Roof SE corner opp FA38	433	10/09/2019	4:30 PM	120	72	81	76	74	72	9	10/09/2019
	NE corner opp FA502 & CM7	434	10/09/2019	4:32 PM	121	72	82	74	73	71	10	Noise from dump station also
	Roof SW corner opp E end RM6	592	2/10/2019	12:57 PM	50	72	81	74	74	71	9	
	Roof SE corner opp FA38	593	2/10/2019	12:59 PM	40	72	81	73	73	71	9	
	NE corner opp FA502 & CM7	594	2/10/2019	1:00 PM	40	71	80	73	72	70	9	

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009
PHT Level 8	PHT L8 Top platform level with top of stack	76	75	79	77	79	78	80	80	81	80	80				-3	-3	-3	-4	-4	-4	-4			
	PHT L8 Top platform EL16 Gbox @ 1m to coupling NW side	79	78	80	79	80	79	81	82							-1	-1	-2	-3						
	PHT L8 Top platform EL16 Gbox @ 1m to coupling SW side	78	77	82	81	79	78	82	80							-4	-1	-4	-2						
	PHT L8 Top platform EL16 Gbox @ 2m to motor S side	78	77	77	76	73	73	78	81							0	4	-1	-3						
	PHT L8 Top platform EL16 Gbox @ 1m to NE side	78	78	79	79	80	80	79	82							-1	-2	-1	-4						
	PHT L8 Lower platform	74	73	76	75	76	76	78	80	80	80	79	77			-2	-3	-4	-6	-6	-6	-5	-3		
	PHT L8 Top platform EL16 Gbox @ 3m to N side	75	75	77	76	77	76	76								-2	-2	0							
	PHT L8 proper FA263 motor & casing @ 1m	88	88	89	88	84	84	85	86	89	85	81				-1	4	3	2	-1	3	8			
	PHT L8 proper 1m to vent on FA263 filter room	77	77	77	76	77	77	74	80							0	0	3	-3						
	PHT L8 centre tower W side	74	73	78	77	78	77	76	76							-4	-4	-2	-3						
	L8 new PHT centre	72	72	74	72	73	73									-1	-1								
	PHT L8 centre tower N side	72	72	72	72	73	72	71	75	74						0	0	1	-2	-2					
PHT Level 7	PHT L8 centre tower E side	72	72	72	71	73	72	71	74							0	-1	1	-2						
	PHT L8 centre tower S side	67	67	67	67	68	67	67	69							0	-1	0	-2						
	PHT L7 New S side centre	70	69	69	68	70	70	70	70							1	-1	0	-1						
PHT L7 Alt Fuels Platform L1	PHT L7 New E side centre	71	71	70	70	73	72	72	72							1	-1	-1	-1						
	PHT L7 New N side centre	72	72	72	71	72	71	71	72							0	0	1	-1						
	PHT L7 Alt Fuels Platform L1: E side of feeder @ 1m	72	72																						
PHT L7 Alt Fuels Platform L2	PHT L7 New E side 4m to base of Alt Fuel chute, 1m to bin W	71	71	70	70											1									
	PHT L7 Alt Fuels Platform L1: E side of mixer @ 1m	73	72																						
	PHT L7 Alt Fuels Platform L2: N side of conveyor discharge	74	73																						
PHT L7 Alt Fuels Platform L2	PHT L7 Alt Fuels Platform L2: 1m E side of chute inlet	73	72																						
	PHT L7 Alt Fuels Platform L2: 1m E side of conveyor 3m from entry to chute	72	72																						
	PHT L7 Alt Fuels Platform L2: 1m NW side of conveyor drive motor	73	73																						
	PHT L7 Alt Fuels Platform L2: 1m SW side of conveyor drive gearbox	72	72																						
PHT Level 7	PHT L7 New centre between towers faces S	72	72	73	72	73	73	75	73	75	71					-1	-1	-2	-1	-2	1				
	L7 between PHTs centre facing W	72	71	72	72	73	72									-1	-1								
	PHT L7 Old S side centre	74	73	74	73	74	74	75	73							0	-1	-1	1						
	PHT L7 under EL13 platform E side	75	74	76	75	74	73	75	76							-2	1	-1	-2						
	EL13 platform E side Gbox & coupling @ 0.5m	82	82	80	79	80	79	81	83							3	3	2	-1						
	EL13 platform N side GB end & side EL @ 1m	77	76	77	77	77	77	77	79	79	79	80				0	0	0	-2	-2	-2	-3			
	L7 BE drive platform N side @ 1m to BE	74	73	74	74	76	75									-1	-2								
	EL13 platform SW side motor & EL & coupling @ 1m	81	80	79	79	78	78	79								2	3	2							
	EL13 platform W side 0.5m	77	76	76	75	75	74	75								1	2	2							
	EL13 platform motor end @ 0.7m			80	79			78	78								0			0	0	0	0		
	EL13 platform motor end @ 0.6m	85	84	80	79			78	78							5		7	6						
	L7 centre between cylinders	73	72	74	73	74	74									-1	-1								
	PHT L7 old NW corner 1.5m to stack	72	71	72	72	74	73	71	74	77	77	77	77	77		-1	-2	0	-2	-5	-6	-6	-5	-5	
	PHT L7 old centre N side	73	72	73	72	74	73	74	74							0	-1	-1	-1						
PHT Level 6 RM Silo Top	PHT L7 old centre N side on new platform	71	70	73	72	0	0	69								-2		2							
	PHT Level 7: FA213 @ 1m, door open	81	80																						
	PHT L6 RM silo above baghouse discharge @ 2m at base of stairs to EL	79	79	86	85	83	82	87	90	86	87	85	85	86	85	-7	-4	-8	-11	-7	-8	-6	-5	-7	-6
	PHT L6 RM silo Top FA260 NE side @ 1m casing & motor	86	86	88	87	87	86	89	88		85					-1	-1	-3	-1		2				
	PHT L6 RM Silo top EL15 platform motor side 0.6m	80	79	82	81	87	87	80								-2	-8	0							
	EL15 W side @ 1m	73	72	74	74	74	73	74	74	81	81	80	80	75		-2	-1	-2	-1	-8	-8	-8	-7	-3	
	L6 RM silo top on BE EL15 platform SW side @ 0.8m	70	69	77	76	76	76									-7	-6								
	EL15 S side Gbox @ 1m	77	76	80	80	80	79	80	77	78	80					-3	-3	-3	-1	-1	-3				
	EL15 E side Gbox @ 0.5m	79	79	78	77	82	81	80	80							2	-2	-1	-1						
	RM silo top baghouse fan DC30 discharge @ 1.5m	87	86	87	86	89	88	88	90	87	86					0	-2	-1	-3	0	1				
	RM Silo top E side 12m to FA260			89	88			74									0								
	RM Silo top E side 12.7m to FA260	74	73	89	88			74								-15		0	0	0	0	0	0	0	
	RM Silo top N side 12.7m to FA260	74	73																						

Table 3.3: Kiln 6 Compare 2019 to previous p.1

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019- 2018	2019- 2017	2019- 2016	2019- 2015	2019- 2014	2019- 2013	2019- 2012	2019- 2011	2019- 2010	2018- 2009
PHT Level 6	PHT L6 centre W side	73	73	74	74	75	74	72	75							-1	-2	1	-2						
	PHT L6 stack test port 100mm diam @ 200mm	87	86	91	90	90	90	86		90	90	90				-4	-3	2		-2	-3	-3			
	PHT L6 stack test port 100mm diam @ 200mm	87	86	91	90	90	90	86		90	90	90				-4	-3	2		-2	-3	-3			
	PHT L6 NW corner 1m to stack	77	77	78	77	77	77	75	83	90	90	90				-1	0	2	-6	-12	-13	-13			
	PHT L6 centre N side by platform	72	72	72	72	73	72	72	73							0	-1	0	-1						
	PHT L6 centre N side on platform	73	72	72	72	73	72	72	73							0	0	0	-1						
	PHT L6 centre between towers	72	72	72	71	74	74	73	73	74	74					0	-2	-1	-1	-2	-2				
	PHT L6 new N side centre	73	73	73	73	73	73	73	74							0	0	1	0						
	PHT L6 new E side centre	73	72	72	71	73	72	74	74							1	0	-1	-1						
	PHT L6 new S side centre	74	73	74	71	72	71	86	73							0	1	-12	1						
PHT Level 6 Inside RM Silo Top	L6 centre S side old PHT by elevator	73	72	73	73	73	73									-1	-1								
	L6 inside doorway to top RM silo room	81	80	83	82	83	82									-2	-3								
	RM Silo top inside centre	82	81	89	87	87	86	89	89	91	87					-7	-5	-7	-7	-9	-6	-6	-2	-4	-6
	RM silo top inside E doors open	80	80	88	87	85	84	84	85	86	83	86	83	84	86	-7	-5	-3	-5	-5	-2	-6	-2	-4	-6
	L6 RM silo top room inside S man door	81	81	86	85	86	85									-5	-4								
PHT Level 5	RM silo top outside S man door	73	73	73	72	73	73	74	74	84	82					0	0	0	-1	-10	-9				
	PHT Level 5 old centre S side by stairs	75	74	73	73	75	74	74								1	0	1							
	PHT Level 5 old centre W side by gas valves @ 1m	79	79	78	78	81	80	78	80	80	80					1	-1	1	-1	-1	-1				
	PHT Level 5 old NW corner @ 1m to stack	74	74	74	74	75	75	74	76							-1	-2	0	-2						
	PHT Level 5 old centre N side	74	74	74	73	74	73	73	75							1	0	1	-1						
	PHT Level 5 centre between towers	73	72	72	72	74	73	73	74	75	74	79	78	75		1	-1	0	-1	-3	-1	-6	-5	-2	
	PHT Level 5 New centre N side	74	74	73	72	73	72	73	74							1	1	1	0						
	PHT Level 5 New centre E side above kiln	74	74	72	72	75	72	75	74							2	-1	-1	0						
PHT Level 4	PHT Level 5 New centre S side	73	72	70	70	71	70	70	72							2	1	2	0						
	PHT Level 4 old centre S side by stairs	82	77	76	75	76	76	77								6	6	5							
	PHT Level 4 old SW corner by water pumps SV09 @ 1m N	80	79	78	78	80	80	79	80	80	79					2	0	1	1	1	2				
	PHT Level 4 old centre W side	77	77	76	76	77	77	76	77							1	0	1	0						
	PHT Level 4 old NW corner @ 1.2m to stack	75	74	75	74	75	74	75	75							0	0	0	0						
	PHT Level 4 old centre N side	75	74	73	73	72	72	72	74							2	3	3	2						
	PHT Level 4 centre between towers by air cannon @ 2m	77	76	73	72	73	73	77	75	75	75					3	3	-1	2	1	2				
	PHT Level 4 new centre N side	75	75	73	73	73	73	73								2	2	2							
	PHT Level 4 new centre E side above kiln	74	74	73	72	73	73	75								2	1	0							
ESP	PHT Level 4 new centre S side	76	73	72	71	71	71	72								5	5	4							
	ESP Centre E side top walkway looking E to PHT	75	74	75	74	73	73	74	74							0	2	1	1						
	ESP top SE corner at barrier	75	74	74	74	74	73	75	72							1	1	0	3						
	ESP top SE corner at barrier - facing ESP	72	71																						
	ESP top centre E side S platform facing PHT	75	74	74	73	73	72									1	2								
	ESP top NE corner at barrier	73	73	73	73	73	72	70	71							0	0	4	2						
PHT Level 3	ESP top NE corner at barrier - facing west	71	71																						
	L3 old PHT centre S side @ 2m to edge facing centre	79	78	78	77	78	77									1	1								
	PHT Level 3 old centre W side above FA39	79	78	78	78	78	78	78								0	0	0							
	PHT Level 3 old centre N side	78	78	77	76	76	76	76								1	2	3							
PHT Level 2.5	PHT Level 3 old centre E side above kiln	79	79	76	75	74	74	76	77	77	77					4	5	3	2	2	3				
	PHT Level 2.5 by DC31 drives @ 1m			89	88	92	92	87	86	86	88							2							
	PHT Level 2.5 old NW corner by stack @ 1.5m, above FA39 inlet	80	79	80	79			78								0									
PHT Level 2.25	PHT Level 2.5 by DC31 drives @ 0.6m	88	87	89	88	92	92	87	86	86	88					-1	-4	1	2	2	0				
	PHT Level 2.25 by centre by kiln entry			88	81	83	81	86	84	82															
	PHT Level 2.5 by DC31 discharge @ 1m	88	88	89	89	92	91	87	86		85					-1	-4	1	2		3				
	PHT Level 2.25 by Radicon Gbox drive E end @ 1m			86	85	91	88	88	84																
	PHT Level 2.25 by centre by kiln entry	88	82	88	81	83	81	86	84	82						-1	5	2	4	6					
PHT Level 2.25	PHT Level 2.25 North Side centre	84	81																						
	PHT Level 2.25 by Radicon Gbox drive E end @ 2.5m	87	85	86	85	91	88	88	84							1	-3	0	3						

Table 3.3: Kiln 6 Compare 2019 to previous p.2

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009
PHT Level 2	L2.25 PHT centre W side facing fan discharge DC70 FA63 @ 4.66m, stack @ 6.35m and stack entry duct @ 6.23m	88	87	89	88	89	89									0	-1								
	PHT Level 2 by E side drive coupling & casing DC70 FA63			86	86	86	86	86	84	85	85										0	0	0	0	
	L2 PHT FA03 casing @ 1m E side	85	84	86	85	87	86									-1	-2								
	PHT Level 2 by E side drive coupling & casing DC70 FA63 centre N side	86	85	86	86	86	86	86	84	85	85					-1	-1	-1	2	1	0				
	PHT Level 2 @ 1m to FA39 stack entry duct			87	87	89	89	85	91											0	0	0	0	0	0
	PHT Level 2 FA63 discharge @ 1.5m	89	88	90	89	92	91	89	86	85	86	88	91	89	91	-1	-3	0	3	4	3	1	-2	0	-2
	PHT Level 2 @ 1m to south side FA39 stack entry duct	87	86	87	87	89	89	85	91							0	-2	2	-4						
	PHT Level 2 FA65 inlet filter @ 1m in front	87	87	88	88	88	88	87	84	84	84					-1	-1	1	3	4	3				
	PHT Level 2 @ 1m to FA39 stack entry duct			88	87	86	84											0	0	0	0	0	0	0	0
	PHT Level 2 FA65 rear side 1m	87	86	87	87	87	86	86	83	83	83					-1	-1	1	3	4	3				
	L2 PHT N side of duct to stack @ 1m and W of stack @ 1m			87	87	88	87											0	0	0	0				
	L2 PHT centre N side edge @ 2m facing centre	83	82	82	81	84	83									1	-1								
	PHT Level 2 @ 1m to north side FA39 stack entry duct	86	85	87	87	88	87									-1	-2								
PHT Level 1	PHT Level 1 RM silo base blower room N side man door @ 1m	81	81	80	80	79	79	79	79							1	2	2	2						
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m NW side	83	82																						
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m E side	83	82																						
	PHT Level 1 FA92 silo vent fan inlet duct @ 1m SE side	80	80																						
	PHT Level 1 FA92 silo vent fan inlet front @ 1m	80	80																						
FA39	FA39 E side at concrete line 5.4m to motor	83	83	85	85	86	85	87								-2	-3	-4							
	FA39 E side @2.3m in line with columns	84	84	91	90	87	86									-7	-3								
	FA39 under discharge duct @ 1m	85	84	84	83	85	84	85								1	0								
	FA39 motor N end @ 1.72 to end plates/stop button			85	84	83	82											0	0	0	0				
	FA39 E side motor platform @ 0.82m to coupling cover	91	91	94	94	98	97									-3	-7								
	FA39 motor platform centre E side@ 1m	90	89	93	92	95	94									-3	-5								
	FA39 motor N end @ 2.7 to end plates/stop button	80	79	85	84	83	82									-5	-3								
	FA 39 N side on kerb	79	78	80	79	81	80	80	81	81	86	85				-1	-2	-1	-2	-3	-8	-6			
	FA39 W side at metal strip 5.25m to motor	84	84	86	85	88	87	88	91							-2	-3	-3	-6						
	FA39 W side at columns @2.7m to plinth	87	87	90	89	89	88									-3	-2								
	FA39 W side motor platform at 0.8m to couling cover & 1m to coupling	90	90	94	93	99	98									-4	-9								
	FA39 W side @ 1m to cladding door open, 1.33m to casing	86	85	87	86	88	87									-1	-2								
	Centre between FA38 & FA39 @ 10.8m facing E			87	86	89	88											0	0	0	0	0	0	0	0
	FA39 S side @ columns 2.7m to bearing	87	86	83	81	83	82									4	4								
	FA39 S side platform bearing cover @ 0.8m	88	87	84	83	86	85									4	2								
FA39	Centre between FA38 & FA39			85	84	88	87	91											0	0	0	0	0	0	0
	Centre between FA38 & FA39 @ 11.2m facing E	83	83	85	84	88	87	91								-2	-4	-7							
	Centre between FA38 & FA39 @ 7.7 m facing FA 38	82	80	85	84	88	87	91								-4	-6	-9							
FA38	FA38 @ 3.9m to E side	82	81	87	86	92	90	93	89							-5	-10	-11	-7						
	FA38 @ 3m to N side	82	81	86	85	88	87	87								-4	-6	-5							
	FA38 @ 5m to NW side at NW column	81	81	91	90	91	89	88	88							-10	-9	-7	-7						
	FA38 @ 5m to NW side at W column	81	80	83	82											-2									
	In centre opening of wall on W side	81	80	83	82	87	85	82								-2	-6	-1							
	FA38 motor platform W side @ 1m to couling cover, 1.9m to casing, 0.7m to motor side	88	87	92	91	100	98									-4	-12								
	FA38 at opening on S side of road facing FA38 opening	78	77	80	79	82	81									-2	-4								
	56' Road kerb N side opp. Opening to FA38	75	75	76	76	78	76	77	79	82	84	86				-1	-3	-2	-4	-7	-8	-11			
	57 Road N side opp FA38 doorway	77	76	79	78	82	80	79	80	83	84	89				-2	-5	-2	-3	-6	-8	-12			
	58 Road N side between FA38 & FA39	77	76	79	78	81	80	79								-2	-4	-2							
RM6	1 RM6 W door @ 1m	78	77	81	80	77	76	78	81	87	70	70	73	72		-3	1	0	-3	-9	8	8	5	6	
	1' RM6 W door at kerb W side @ 13.3m	70	70	72	71	69	69	70	72	76	76	80	83	82	82	-2	1	0	-2	-6	-6	-9	-12	-12	-12

Table 3.3: Kiln 6 Compare 2019 to previous p.3

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results										
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009	
RM7 Building Ground Level	1 RM7 at roadside kerb ~32m	67	67	68	67	69	69	69	70	69	68	70	69	69	70	-1	-2	-2	-2	-2	-1	-2	-2	-2	-3	
	2 Rm7 @ 15.5m to W door	72	72	73	72	73	72	72	72	73	73	76	75	75	74	-1	-1	1	1	-1	-1	-3	-3	-3	-2	
	3 RM7 W wall door @ 1m	78	78	80	79	82	81	79	80	80	79	82	81	80	78	-2	-4	0	-2	-2	-1	-3	-2	-2	0	
	4 RM7 NE corner wall vents 2 1m	80	79	81	80	80	79	81	82	83	81	83	83	82	83	-2	0	-1	-3	-3	-2	-4	-3	-2	-3	
	5 RM7 N side NW roll door @ 1m	80	79	79	78	86	84	79	80	78	81	81	81	81	79	1	-6	0	0	1	-1	-1	-1	-2	1	
	6 RM7 N wall vents centre next to Roll door	82	81	82	81	81	80	82	83	84	84	85	85	83	83	0	1	0	-1	-2	-2	-3	-3	-1	-1	
	RM7 vents N wall W of man door	83	82	82	81											1										
	7 RM7 N wall man door	80	79	80	79	79	79	83	80	79	83	82	82	81		0	1	-3	0	1	-3	-2	-1	-1		
	8 RM7 E wall vents NE corner @ 1m	83	82	83	82	82	81	85	84	83	84	85	82	83	84	0	1	-2	-1	0	-1	-3	1	0	-1	
	9 RM7 E side under duct	81	79	80	78	78	77	81	81	79	81	82	81	80	80	1	3	0	0	2	0	-1	0	1	1	
	10 RM7 By E door RM7 floor	78	76																							
	10 RM7 By E door Hydraulics room open	73	72	72	72	72	72	74	73	73	72	74	74	73	74	1	1	-1	0	0	1	-1	0	0	-1	
	11 RM7 Centre Compressor room door @ 1m closed	72	72	73	72	74	73	74	74	73	71	72	71	73		0	-1	-1	-2	-1	2	1	2	-1		
	11A RM7 compressor room W door @ 1m closed	71	71	72	71											0										
RM7 Building Ground Level	12 RM7 Under E inlet for switchroom fan	84	83	85	84	84	83	84	87	83						-1	1	1	-3	1						
	12B Under switchroom fan duct W	78	77	78	77	89	87									0	-11									
	12 RM7 E inlet for switchroom fan @ 1m to N side and 0.6m below	77	76																							
FA249	13 FA249 under inlet duct W side	81	80	75	75	78	77	78	78	80	80					6	4	3	3	1	1					
	14 FA249 2m W side ground level	84	83	77	77	79	78	82	80	80	80					7	5	2	4	4	4					
	14' FA249 motor platform fan coupling & casing W side @ 1m	82	81	80	79	81	80	82	82	80	81	82	81	79	79	3	2	0	0	2	1	1	2	3	3	
	15 FA249 1m motor end	84	82	79	78	81	80	82	81	80	81	81				5	3	2	3	4	3	3				
	16 FA249 end at column 4.3m N of motor plinth	84	83	77	77	79	78	80	79	77	79	81	82	82		7	6	4	6	7	5	4	3	2		
	17 FA249 motor platform E side coupling & casing 1m	82	81	81	80	82	81	84	82	81	82	84	82	89	83	2	1	-2	0	2	1	-1	0	-7	-1	
	18 FA249 Platform S side centre @ 1m	74	74	76	76	76	75	78	78	78	78	76	77	83	79	-1	-2	-4	-3	-4	-3	-2	-3	-9	-5	
	18' FA249 platform S side under discharge duct E side	77	76	73	72	75	74	74								5	2	3								
	19 FA249 S side @ 5m			71	70	71	71	73	72	72	73	73	73	74											0	
	19 FA249 S side @ 5.5m	73	73	71	70	71	71	73	72	72	73	73	73	74		3	2	1	1	2	0	0	1	-1		
	19 FA249 S side @ 3.8m	72	71																							
	20 FA 249 S side @ 10m			71	71	72	71	73	72	72	73	73	73												0	
20 FA 249 S side @ 10.9m	75	74	71	71	72	71	73	72	72	73	73	73			4	4	3	3	3	2	2	2				
21 FA249 E side of fan casing ground level @ 2m	75	73	71	71	77	76	76	76	76	76	77	76	79		4	-2	-2	-1	-1	-1	-3	-1	-4			
FA250	22 FA250 S side 4m to motor end			79	78	80	79	83	79	78																
	22 FA250 S side 4.2 m to motor end	86	84	79	78	80	79	83	79	78						7	6	2	7	7						
	22' FA250 Motor end S side @ 1m	84	83	81	81	81	81	84	82	80	82	83	82	83		3	3	0	2	3	2	1	2	1		
	23 FA250 E side platform coupling & casing	86	85	85	84	85	84	86	84	83	83	85	84			1	1	0	2	3	3	1	2			
	23' FA250 E side centre motor @ 1m	84	83	83	83	82	82	84	85	80	85	86				1	2	0	-1	4	-1	-2				
	FA250 W side motor shaft @ casing @ 1m	86	86	87	87	85	84									-1	1									
	25 FA250 coupling & casing W side motor centre @1m	84	83	84	83	82	82	86	84	80	85	86				0	1	-2	-1	4	-1	-2				
	29 FA250 E side under discharge duct @ 1.5m			80	79	81	80	82	82																	
	29 FA250 E side under discharge duct @ 1.5m, at lower step of concrete	84	83	80	79	81	80	82	82							4	3	3	2							
	26 FA250 W side casing @ 1m & coupling @ 3m	83	82	81	81	82	81	83	81	79	83	83	84	85	81	2	1	0	1	4	0	0	-1	-2	2	
	27 FA250 W side 1m under inlet casing expansion joint	82	81	79	78	79	79	83	80	78	85	84				3	3	0	2	4	-3	-2				
	28 FA250 N side casing shaft platform @ 1m	84	83	81	81	81	81	85	84	84	91	86	85	93	83	3	3	-1	-1	0	-7	-3	-1	-9	1	
RM7 Roof / Platform	Lower platform E side 1m to Magnete plate	90	89	92	91	89	88	86	89	83	88	87	85	88	90	-2	1	4	1	7	2	4	5	2	0	
	Lower platform S side @ 1m to magnete plate	91	90	93	92	92	91	89	90	82	91	91	87	91	93	-2	-1	2	2	10	0	0	4	0	-2	
	Lower platform W side @ 0.9m to magnete plate	90	89	91	90	89	88	86	88	81	87	85				-1	1	4	2	9	3	5				
	Lower platform N side @ 1m to magnete plate	89	88	91	90	90	88	88		84	92	84	85	84	86	-2	-1	2		5	-2	5	4	5	3	
	Lower platform N side @ 1m to BE casing	85	84	86	84	85	83	83	84	83	86	81				-1	0	3	1	3	-1	4				
	Platform S of Magnete 2m to S side	86	85	88	86	78	77	85	87							-1	8	2	0							
	Platform S of Magnete 2m to S side	87	86	88	86	78	77	85	87							-1	9	2	0							
	Lower platform N side @ 1m to BE casing	85	84	86	84	85	83	83	84	83	86	81				-1	0	3	1	3	-1	4				
	Upper Platform Gbox @ 1m E side & 0.5m casing	82	81	81	80	82	81	80	81	77	80	79				0	0	2	0	4	2	3				
	Upper Platform Gbox @ 1m N side	82	81	81	81	82	81	81	83	81	83					1	0	1	-1	1	-1					
	Upper Platform motor end @ 1m W side	82	81	82	80	82	81	80	81							1	0	2	2							
	Upper Platform BE casing @ 0.9m W side	82	80	81	80	80	79	78	79	78	81	79	78	81	82	0	1	4	3	4	1	3	3	1	-1	
	Upper Platform BE casing @ 1m S side	85	84	88	85	87	84	84	81	8																

Table 3.3: Kiln 6 Compare 2019 to previous p.4

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009
RM7 Baghouse area	On tower to baghouse top S side above FA249 same level as roof RM7	72	70	68	68	71	70	74	70	69	70	71	71			4	1	-2	3	3	2	1	1		
	On tower to baghouse top S side above FA249 top level	69	68	68	67	82	81	70	69	71	68					1	-13	-1	0	-2	1				
	Baghouse S doorway open	81	73	78	71	80	75	81	80	78	72	87	96	73		3	1	0	1	3	9	-6	-15	8	
	Inside centre baghouse top	83	70	82	69	82	72	82	83	81						1	1	2	0	3					
RM7 Inside	Top floor E open doorway	85	84	86	85	89	87	85	86							-1	-4	0	-1						
	Centre top 2m N of BE casing	88	87	90	89	89	88	89	92							-2	-1	-1	-4						
	Top level 1m E side entry of conveyor to chute	91	90	93	92	94	92	90	89							-1	-3	1	2						
	Top level by top of RM7	92	90	93	91	92	90	94	92	94	96	98	95	93	94	-1	0	-2	0	-2	-4	-6	-3	-1	-2
	Top level W side of chute entry end of conveyor	92	91	94	93	94	91	92	93	92	94					-2	-1	0	-1	0	-2				
	Top level W side of chute opening entry of conveyor	92	91	93	92	93	91									-1	-1								
	Top level centre W side platform	89	88	91	89	89	87	89	91							-1	1	1	-1						
	Top level in doorway of conveyor from RM6	86	85	87	86	87	85	86	86	85	88	88				-1	0	1	0	1	-2	-2			
	On conveyor walkway on centre from RM6 at centre light	79	78	77	76	80	79	78	78	76	79	78	87	88	84	2	-1	1	1	3	-1	1	-8	-9	-5
RM7 Inside	Level 3 2m N of BE casing	89	88	90	89	89	87	90	91							-1	0	-1	-2						
	Level 3 between chute & duct on top of Mill	93	92	94	92	95	93	94	94							-1	-2	-1	-1						
	Level 2 2m N side of BE casing	90	89	91	89	89	87	90	92							-1	1	-1	-2						
	Level 2 1m N of cone top of Mill by entry door	92	91	92	91	91	89	92	94							0	1	1	-2						
	Level 1 2m N of BE casing is work bench	91	89	92	90	89	88	91	94							-2	1	-1	-3						
	Level 1 2m to RM7 body N side	92	91	94	92	93	90	93	97							-2	-1	-1	-4						
	Level 1 2m W side of RM7 on platform	92	91	94	92	92	90	94								-2	0	-2							
	L0 1m E side of feeder VF100 inlet chute & RM7 body	97	94	99	96	94	92	95								-2	3	2							
	L0 Ground Floor 3m N of BE casing	92	91	93	92	90	89	95								-1	2	-2							
	L0 Inside man door N side	92	91	93	91	88	87	94								0	5	-2							
	L0 Inside W roll door @ 1m	91	90	92	90	91	90	92	93							-1	-1	-1	-3						
	L0 Drive motor N @ 2m to N side & 3m to mill body	94	93	95	93	93	92	94	97							-1	1	0	-3						
RM7 bag-house hopper area	L0 Drive motor S side @ 2m and RM7 body @ 2m	92	91	94	92	93	91	93								-2	-1	-1							
	L0 RM7 body S side @ 2m	91	90	93	92	92	90	93								-2	-1	-2							
	L0 NW corner 1.5m to roll door and vents	89	88	91	90											-2									
	On screw conveyor SC212 platform Level 1 W end side by fan motor @ 1m	79	79	79	78	82	81	81								1	-2	-2							
	Centre S side of screw in line with motor FA250	78	77	77	76	80	80	80								1	-3	-2							
	E end of SC212 body @ 2m and other N-S aligned screw	78	77	76	75	79	78	95								2	-1	-17							
	Centre E side - off			79	78	79	78	83	79	78	77	78										0	0	0	
	Centre E side - on	79	78	79	78	79	78	83	79	78	77	78				0	0	-4	-1	1	2	1			
	Main platform of baghouse hopper screws S end chute	78	77	77	77	77	77	85								1	1	-7							
	W side between SC211 & gate valve																								
	By FA252 @ 1m shaft , casing & discharge box			76	74			83	83								0			0	0	0	0	0	0
	Centre W side	79	78	78	77	78	78	91	80	78	79	79	80			1	0	-12	-1	1	0	0	-1	0	0
Kiln 6 South side coal road	N end Sc211 but S of duct	80	79	78	78	76	75	84								1	4	-4							
	By FA252 @ 0.8m shaft S side, casing & discharge box	79	78	76	74			83	83							3		-4	-4						
	By FA252 @ 0.8m shaft N side, casing & inlet	81	80																						
	Baghouse hopper platform level N end	78	77	77	76	77	76	80	78	76						2	1	-2	1	3					
	Baghouse hopper centre platform	78	77	75	75	76	76	81	76	78	77	78				2	1	-4	2	0	1	0			
	By FA252 @ 1m to side discharge box top grill	79	79																						
	30 Coal Road S side in line W side RM7	66	65	67	66											-1	2	0	-1	1	1	-1	1	0	1
	30 Coal Road S side in line W side RM7	66	65	66	65	65	64	66	67	66	65	67	65	66	65	1	2								
	31 Coal Road S side in-line E side RM7	67	66	65	65											2									
	31 Coal Road S side in-line E side RM7	67	66	67	66	71	64	66	66	66	66	68	66	67	68	0	-4	1	1	1	1	-1	1	0	-1
	32 Coal Road S side in-line FA249	69	68	67	67	66	65	68	67	67	68	70	68	69	69	2	3	1	2	2	1	-1	1	0	0
	32 Coal Road S side in-line FA249	69	68	66	65											3									
	33 Coal Road S side Centre Blending Silo	70	69	69	68	67	66	68	68	69	69	71	69	71	69	1	3	2	2	1	1	-1	0	-1	1
	33 Coal Road S side Centre Blending Silo	70	69	67	66											3									
	34 Coal Road S side E side PHT	70	69	68	68	67	66	67	68	71	69	70	69	70		2	3	3	3	-1	2	0	1	0	
	34 Coal Road S side E side PHT	70	69	67	67											3									
	35 Coal Road S side E side new PHT	71	70	68	68	67	66	68	68	70	68	71	70	70	69	2	4	2	2	1	2	0	1	1	2
	35 Coal Road S side E side new PHT	71	70	67	67											3									
	35 Coal Road S side E side new PHT	70	70	67	67											3									
	35 Coal Road S side E side new PHT	70	70	68	68	67	66	68	68	70	68	71	70	70	69	2	3	2	2	0	2	-1	0	0	1
	36 Coal Road S side E side drive platform	72	70	67	66	67	67	69	68	70	69	70	70	71	70	5	4	3	4	2	3	2	2	1	2
	36 Coal Road S side E side drive platform	69	69	67	66	67	67	69	68	70	69	70	70	71	70	2	2	1	1	-1	0	-1	0	-2	-1
	37 Coal Road S side centre column W support duct	69	68	67	67	68	67	69	69	69	69	70	70	71	71	2	1	0	0	0	1	-1	-1	-2	-2

Table 3.3: Kiln 6 Compare 2019 to previous p.5

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009
Kiln 6 South side coal road	37 Coal Road S side centre column W support duct	70	69	67	67	68	67	69	69	69	69	70	70	71	71	3	2	1	1	1	1	0	0	-1	-1
	38 Coal Road S side centre pedestal	69	68	68	67	69	68	69	68	69	68	71	69	71	71	1	0	0	1	0	1	-2	0	-2	-2
	38 Coal Road S side centre pedestal	70	69	68	67	69	68	69	68	69	68	71	69	71	71	2	1	0	2	1	2	-1	0	-1	-1
	39 Coal Road S side Between centre & E pedestal	70	70	69	68	68	68	69	68	69	68	69	69	71	71	2	2	1	2	1	2	1	1	-1	-1
	39 Coal Road S side Between centre & E pedestal	69	69	69	68	68	68	69	68	69	68	69	69	71	71	1	1	0	1	1	1	1	0	-2	-2
	40 Coal Road S side E pedestal	69	69	68	67	68	67	69	68	68	68	70	69	70	74	1	1	1	1	1	1	-1	0	-1	-5
	40 Coal Road S side E pedestal	70	69	68	67	68	67	69	68	68	68	70	69	70	74	2	2	1	2	2	2	0	0	-1	-5
	41 Coal Road S side W end Firing floor building	69	68	66	66	66	65	68	66	67	67	70	69	69		2	3	1	3	2	2	-2	0	0	
	41 Coal Road S side W end Firing floor building	68	67	66	66	66	65	68	66	67	67	70	69	69		1	2	0	2	1	1	-3	-1	-2	
	42 Coal Road S side opposite grate	68	67	67	67	67	66	69	66							1	1	-1	2						
	42 Coal Road S side opposite grate	68	68	67	67	67	66	69	66							1	1	0	2						
	43 Coal Road S side W side coal receival bin 25m to truck	62	62	68	67	64	63	67	64							-6	-2	-5	-2						
	43 Coal Road S side W side coal receival bin 25m to truck	71	69	68	67	64	63	67	64							3	7	4	7						
Fenceline South	42' Coal Road N side opposite grate	69	69	67	67	67	66	69	66							2	2	1	3						
	Former Gate site opp W end Firing floor	57	56	58	57											-1									
	Top N edge of bank opposite centre pedestal	59	58	60	59											-1									
	Top N edge of bank 21m S of centre Alt Fuels Building	51	50	54	52											-3									
	Top N edge bank Opposite E side old PHT	60	59	56	55											4									
Kiln 6 S side Coal Mill Room Area	Bottom N edge of bank 13m S of centre Alt Fuels Building	50	49																						
	43A Kerb E side CM opp CM fan discharge	77	76	72	72	75	74	80	77	78	79	78				5	2	-3	0	-1	-2	-1			
	43A Kerb E side CM opp CM fan discharge	77	76	81	80	75	74	80	77	78	79	78				-4	2	-3	0	-1	-2				
	44A Under Coal Mill fan discharge	88	88	88	88											0									
	N edge of bank 21m S of centre Alt Fuels Building			54	52																				
	44 CM fan room roll door @ 2m	84	84	83	83	85	85	84	84	85	83					1	-1	0	0	-1	1	0	0	0	0
	N edge bank Opposite E side old PHT			56	55												0	0	0	0	0	0	0	0	0
	44 CM fan room roll door @ 2m	82	82	83	83	85	85	84	84	85	83					-1	-3	-2	-2	-3	-1				
	44' CM S wall E door @1m,	88	87	85	85	92	92	83								2	-4	5							
	45 CM S roll door and wall vent @ 9.9m S side	80	79	75	75	78	78	78	76	79	78					4	2	2	4	1	2				
	46 CM room wall vent @ 2m	84	84	80	79											4									
	44A Under Coal Mill fan discharge			88	88												0	0	0	0	0	0	0	0	0
	46 CM room wall vent @ 2m	84	84	82	82	77	77	82	81	86	80	83	89	90		2	7	3	4	-2	4	1	-5	-6	
	44A Under Coal Mill fan discharge	88	88	85	84											4									
	46A Coal Mill Room S roll door W @ 1m	84	83	81	81											3									
Kiln 6 South side	46A Coal Mill Room S roll door W @ 1m	84	83	82	82											2									
	47B Centre between Grate & CM blower rm roll door	87	86	87	86	86	86	86	89	89	92					0	0	0	-2	-3	-5				
	47B Centre between Grate & CM blower room roll door	87	86	87	86	86	86	86	89	89	92					0	0	0	-2	-3	-5				
	44 CM fan room door @ 2m			83	83												0	0	0	0	0	0	0	0	0
	47A Centre between CM Room and grate	80	80	78	78	79	79	79	78	81	82					2	1	1	2	-1	-1				
	44' CM S wall door @1m,			85	85	92	92	83											0	0	0	0	0	0	0
	47 Opp FA264 @ 8m	81	80	85	85	81	81	80	80	81	81					-5	-1	1	1						
	44' CM S wall door @1m,	88	87	86	85											2									
	47C Between FA264 & FA200	81	81	82	82			80								-1		1							
	45 CM S roll door and wall vent @ 10m S side			75	75	78	78	78	76	79	78										0	0	0	0	
	47D FA 200 S Side @ 5m	83	83	84	84	82	82	82	81							-1	1	1	2						
	48 Opp. E pedestal roller	83	83	84	83	83	82	81	81	81	80	83	81	83	83	0	1	3	2	2	3	1	2	0	0
Kiln 6 South side	45 CM S roll door and wall vent @ 10m S side			78	78												0	0	0	0	0	0	0	0	0
	49 Half way between centre & E pedestals	84	84	83	83	83	83	81	82							1	1	3	3						
	50 Opp. Centre pedestal	82	81	80	80	80	79	81	81	80	81	85	84	83	83	1	2	1	1	2	1	-3	-3	-1	-1
	51 Half way between Centre & Western pedestals, by duct support trestle	81	80	79	79	76	76	77	81	80	80	83	82	81	80	2	5	4	0	1	1	-2	-2		
	52A Opp E end of kiln drive platform	81	81	76	76	77	76	78	79	78	78	83	80	80	80	5	4	4	2	3	3	-1	2	1	1
	52 Opp W pedestal roller	82	82	76	76	76	75	76	79	76	76					6	7	7	4	6	6				
	53 Kiln drive platform Centre E end on platform (ground level)	85	85	81	80	74	73	87	88	88						5	11	-2	-3	-3					

Table 3.3: Kiln 6 Compare 2019 to previous p.6

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009
Kiln Drive platform	S side S motor end @ 1.5m kiln drive	84	84	81	81	84	83									3	1								
	S side of S Gbox @ 1.5m	85	84	83	83	88	86	87	88							2	-3	-2	-3						
	47 Opp FA264 @ 2m			85	85	81	81	80	80	81	81											0			
	E side of S drive motor @ 1.5m, 2m to Gbox	86	86	84	84	88	87	86								2	-2	0							
	53 Kiln drive platform Centre E end on platform between motors	88	88	86	86	89	88	87	88	88						2	-1	1	0	0					
	53 Kiln drive platform Centre E end on platform between gearboxes	86	86	87	86											-1									
	N side motor end @ 1m kiln drive	85	85	85	85	86	85									0	0								
	N side motor N end @ 1.5m kiln drive	85	84	84	84	84	83									0	1								
	N side of N drive & Gbox @ 1.5m	86	85	85	85	86	85	86	87	88						0	-1	-1	-1	-2					
Kiln 6 road Northern side	54 W end RM6	70	69	71	70	69	69	70	73	76	76	80	83	82	82	-1	1	0	-3	-6	-6	-10	-13	-12	-12
	55 Centre RM6	71	70	72	71	71	71	72	74	73	75	74				-1	-1	-1	-3	-3	-4	-3			
	56 E End RM6	76	75	76	75	76	75	76	78	79	80	81				-1	0	-1	-2	-4	-4	-6			
	56' Between RM6 & New wall for FA38	77	77	75	74	78	76	82	79	82	84	86				2	-1	-5	-2	-5	-7	-9			
	57 Door opp FA38	77	77	79	78	79	78	79	80	83	84	89				-2	-2	-2	-2	-5	-7	-11			
	58 Half way between FA38 & FA39, by big column	78	77	80	79	82	81	79	81	81	86	85				-2	-4	-1	-3	-4	-9	-7			
	59 Opp FA39 end	79	78	80	79	82	81	79	81	81	86	85				-2	-3	0	-2	-3	-8	-6			
Fenceline South	Former Gate site opp W end Firing floor	57	56	58	57											-1									
	Top N edge of bank opposite centre pedestal	59	58	60	59											-1									
	Top N edge of bank 21m S of centre Alt Fuels Building	51	50	54	52											-3									
	Top N edge bank Opposite E side old PHT	60	59	56	55											4									
	Bottom N edge of bank 13m S of centre Alt Fuels Building	50	49																						
Kiln Drive platform	S side S motor end @ 1.5m kiln drive	84	84	81	81	84	83									3	1								
	S side of S Gbox @ 1.5m	85	84	83	83	88	86	87	88							2	-3	-2	-3						
	E side of S drive motor @ 1.5m, 2m to Gbox	86	86	84	84	88	87	86								2	-2	0							
	53 Kiln drive platform Centre E end on platform between motors	88	88	86	86	89	88	87	88	88						2	-1	1	0	0					
	53 Kiln drive platform Centre E end on platform between gearboxes	86	86	87	86											-1									
	N side motor end @ 1m kiln drive	85	85	85	85	86	85									0	0								
	N side motor N end @ 1.5m kiln drive	85	84	84	84	84	83									0	1								
	N side of N drive & Gbox @ 1.5m	86	85	85	85	86	85	86	87	88						0	-1	-1	-1	-2					
	Kiln 6 road Northern side	54 W end RM6	71	70	71	70	69	69	70	73	76	76	80	83	82	82	0	2	1	-2	-5	-6	-9	-12	-11
55 Centre RM6		72	71	72	71	71	71	72	74	73	75	74				0	0	0	-2	-1	-3	-2			
56 E End RM6		74	74	76	75	76	75	76	78	79	80	81				-2	-2	-2	-4	-5	-6	-7			
56' Between RM6 & New wall for FA38		75	75	75	74	78	76	82	79	82	84	86				1	-3	-6	-4	-7	-8	-11			
57 Door opp FA38		77	77	79	78	79	78	79	80	83	84	89				-2	-2	-2	-3	-6	-7	-12			
58 Half way between FA38 & FA39, opposite big column		77	77	79	78	80	79	79	80							-2	-3	-2	-3						
59 Opp FA39 end		78	78	80	79	82	81	79	81	81	86	85				-2	-4	-1	-3	-3	-8	-7			
60 Opp Conditioning Tower		78	78	81	80	81	80	80	84	80	82	81	84	83	83	-2	-2	-1	-5	-2	-3	-2	-6	-5	-5
60' Opp. Stack		79	79	79	78											0									
60' Opp. Stack		79	79	79	78	82	81	78	80							-1	-3	1	-1						
61 Opp centre PHT				78	77	77	76	77																	
61' Opp E side of old PHT				78	77	78	78	76	78	78	78	79	79	79											
63 Opp E side new PHT				77	77	77	76	77	80	77	78	79	81	80											
64 E end drive platform		83	83	79	79	78	77	79	82	78	80	82	82			4	5	4	1	5	3	1	1		
65 Opp column for return duct W side		85	84	81	81	80	80	81	85	81	86	85	85	82	83	3	4	3	0	4	-2	0	0	3	2
66 Opp centre pedestal		88	87	86	85	85	85	85	87	84	83	88	88	85	85	2	3	3	1	4	5	0	-1	3	3
67 Half way between centre & e pedestals		87	87	86	86	85	85	85	87	87	87	87	88	89	88	1	2	2	0	0	0	0	-1	-2	-1
58 Half way between FA38 & FA39				79	78	80	79	79	80										0	0	0	0	0	0	0
68 Opp E pedestal		89	89	86	86	86	86	86	86	86	87	88	88	88	88	3	3	3	3	3	2	2	1	1	1
Grate Cooler Fan Courtyard		69 Centre courtyard - opposite F201	93	93	88	88	85	85	89	89	88	88	88	89	87	88	5	8	4	4	5	5	5	4	6
	69 Centre courtyard - opposite F203	93	92	88	88	85	85	89	89	88	88	88	89	87	88	5	7	4	4	5	5	5	4	6	5
	FA201 @ 2m	96	96	90	89	90	90	90	91							6	6	6	5						
	FA201 N side inlet & casing @ 1m	98	98	91	91	92	91									7	6								
	61 Opp centre PHT			78	77	77	76	77											0	0	0	0	0	0	0
	Between FA201 & 203 & 202	99	98	93	93	94	93	93	93	93	87	88	89	87	88	6	5	5	6	6	11	11	10	12	11
	61' Opp E side of old PHT			78	77	78	78	76	78	78	78	79	79	79											0
	63 Opp E side new PHT			77	77	77	76	77	80	77	78	79	81	80											0
	FA203 inlet & casing @ 2m	93	93	89	89	89	89	89	90							4	4	5	3						
	FA203,FA204 & FA205 @ 1m	92	92	89	88											4									
Grate Cooler Fan Courtyard	Between inlet filters FA205 & FA206	88	87	85	84	89	88	85	89	89						3	-1	3	-1	-1					

Table 3.3: Kiln 6 Compare 2019 to previous p.7

Table 3.3: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019- 2018	2019- 2017	2019- 2016	2019- 2015	2019- 2014	2019- 2013	2019- 2012	2019- 2011	2019- 2010	2018- 2009
Grate area north	Centre between Grate & CM blower room roll door	87	86	87	86	86	86	86	89	89	92					0	0	0	-2	-3	-5				
	Coal Mill Building N roll door @ 2m	86	85	83	83	86	85	84	84	90	88					3	0	2	2	-4	-2				
Kiln Firing Floor	Centre N side opening face E	85	82	85	82	85	83	82	83	83	81		86	83		0	0	3	2	2	4		-1	2	
	Centre N side opening face W	83	83	82	82											1									
	FA209 E side inlet & filter silencer	87	86	86	86	86	85									1	1								
	FA209 Kiln Discharge Seal Fan N inlet W side @ 1.5m	93	93	94	93	93	93	92	93	92	90		94	92		0	0	1	1	1	3		-1	1	
	Centre S side opening face E	82	81	82	81	83	82	82	84	82	81		81	81		0	-1	0	-2	0	2		1	1	
	Centre S side opening face W	81	81	81	81											0									
	FA210 Kiln Discharge Seal Fan S inlet @ 1.5m	92	92	92	91	92	92	94	95	85	96	94	96	92		0	0	-2	-3	7	-3				
	FA210 S side seal fan inlet W side & casing @ 1m	86	86	85	85	85	85									1	1								
	FA200 inlet side @ 1.5m	89	89	87	86	87	87	85	87							3	2	4	2						
	New replacement FA211 centre under kiln, inlet @ 1m	97	97	96	95	96	96			96						1	1			1					
	Kiln floor centre E S of duct/clinker elevator	82	80	81	80	81	81	79	81	82	85	82	84			1	0	2	1	-1	-3	-1	-3		
	KFF burner air cannon N side @ 2m	88	84	89	86	90	85									-2	-3								
	KFF burner by air cannon S side @ 2m	85	84	89	87	90	85									-4	-5								
Radicon Cooler	RC L1 centre fan @ 1m	86	86	83	83	92	92	91	84	93	93	83	93	85	84	3	-6	-5	2	-7	-8	3	-7	1	2
	RC L1 S fan @ 0.5m	87	86	83	83	90	90	92	84		95					4	-3	-5	2	-8					
	RC L1 N fan @ 1m	86	85	83	82	89	89	90	85	94	97					3	-3	-5	1	-8	-12				
	RC L2 centre fan @ 1m	85	85	83	83	94	94	94	85	96	96	84	95	86	85	2	-9	-9	0	-10	-11	2	-10	-1	0
	RC L2 S fan @ 0.7m	86	85	84	84	95	94	95	84		95					1	-9	-9	1	-9					
	RC L2 N fan @ 1m	85	85	84	83	95	95	95	86	96	97					2	-10	-10	-1	-10	-12				
	RC L3 Centre fan @ 1m	85	85	85	84	94	94	95	85	95	96	83	94	86	83	0	-9	-9	0	-10	-11	2	-9	-1	2
	RC L3 S fan @ 0.7m	85	84	83	83	94	93	93	83		93					2	-9	-9	2	-8					
	RC L3 N fan @ 1m	85	84	84	84	95	94	94	91	97	97					0	-10	-10	-6	-13	-13				
	RC L4 Centre fan @ 1m	85	84	85	84	95	95	92	92	92	88	82	88	85	84	1	-10	-7	-7	-3	3	-3	0	1	
	RC L4 S fan @ 0.7m	86	85	87	86	93	93	91	90	86	89					-1	-8	-6	-4	0	-3				
	RC L4 N fan @ 1m	82	81	84	84	90	88	93	91	97	97					-3	-8	-11	-9	-16	-16				
	RC L5 face E	80	80	79	79	85	85	84	86	84						1	-5	-3	-5	-4					
	RC L5 face W	81	81	80	79	86	85	85	87							2	-4	-4	-6						
	L1 E side 2.4m	77	76	77	76											0									
	L1 E side 6m	75	75	75	75											0									
	L1 E side 12m	72	72	73	73											-1									
FA215	Motor S end @ 2.5m	78	78	80	80	81	81	80	81	87	85	85	86	85	84	-2	-3	-2	-3	-9	-6	-7	-8	-7	-6
	Platform E side drive coupling @ casing @ 1m	81	80	84	83	84	84	85	85	85	85					-4	-4	-5	-5	-4	-4				
	W side platform @ 1m to coupling & casing	81	81	85	84	85	85	85	86	87	85	86	87			-4	-4	-4	-5	-6	-3	-5	-5		
	Under expansion joint discharge duct to stack @ 1m	75	74	79	78	79	78	79	80	81	78	81	80	78	79	-4	-4	-4	-5	-6	-4	-6	-5	-3	-4
	N side inlet box platform @ 1m to discharge duct & inlet box	71	70	74	74	78	77	77	79	79	75					-4	-7	-6	-9	-8	-4				
	Platform centre N side inlet box	72	72	73	73	77	76	76	79	79	74	78	78	78	74	-1	-4	-4	-6	-7	-2	-6	-6	-6	-2
	Under Inlet box W side entry duct	76	75	78	78	80	80	79	81	83						-2	-4	-4	-6	-7					
Control Building Roof	Inlet box N side ground level @ 1m	73	72	74	74			75	78	77						-1		-3	-5						
	Roof SW corner opp E end RM6	71	70	71	70	72	70	69								0	-1	2							
	Roof SW corner opp E end RM6	71	70	70	69	72	70	69								1	-1	2							
	Roof SE corner opp FA38	72	72	72	71	72	71	71								1	0	2							
	Roof SE corner opp FA38	72	72	72	70	72	71	71								1	0	2							
	Admin Building Roof NE corner opp FA502 & CM7	72	71	70	70	72	71	68								2	0	4							
	Admin Building Roof NE corner opp FA502 & CM7	72	71	71	70	72	71	68	69							1	0	4	3						

Table 3.3: Kiln 6 Compare 2019 to previous p.8

Table 3.3A: Boral Cement Berrima Annual Noise 2019 - Locations with increased LAeq results compared to those of Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009
PHT L8	PHT L8 Top platform EL16 Gbox @ 2m to motor S side	78	77	77	76	73	73	78	81							0	4	-1	-3						
	PHT L8 proper FA263 motor & casing @ 1m	88	88	89	88	84	84	85	86	89	85	81				-1	4	3	2	-1	3	8			
PHT L7	EL13 platform motor end @ 0.6m	85	84	80	79			78	78							5		7	6						
PHT L4	PHT Level 4 old centre S side by stairs	82	77	76	75	76	76	77								6	6	5							
	PHT Level 4 new centre S side	76	73	72	71	71	71	72								5	5	4							
ESP	ESP top NE corner at barrier	73	73	73	73	73	72	70	71							0	0	4	2						
PHT L3	PHT Level 3 old centre E side above kiln	79	79	76	75	74	74	76	77	77	77					4	5	3	2	2	3				
PHT L2.25	PHT Level 2.25 by centre by kiln entry	88	82	88	81	83	81	86	84	82						-1	5	2	4	6					
PHT L2	PHT Level 2 FA63 discharge @ 1.5m	89	88	90	89	92	91	89	86	85	86	88	91	89	91	-1	-3	0	3	4	3	1	-2	0	-2
	PHT Level 2 FA65 inlet filter @ 1m in front	87	87	88	88	88	88	87	84	84	84					-1	-1	1	3	4	3				
	PHT Level 2 FA65 rear side 1m	87	86	87	87	87	86	86	83	83	83					-1	-1	1	3	4	3				
FA39	FA39 S side @ columns 2.7m to bearing	87	86	83	81	83	82									4	4								
	FA39 S side platform bearing cover @ 0.8m	88	87	84	83	86	85									4	2								
RM6	1 RM6 W door @ 1m	78	77	81	80	77	76	78	81	87	70	70	73	72		-3	1	0	-3	-9	8	8	5	6	
FA249	13 FA249 under inlet duct W side	81	80	75	75	78	77	78	78	80	80					6	4	3	3	1	1				
	14 FA249 2m W side ground level	84	83	77	77	79	78	82	80	80	80					7	5	2	4	4	4				
	14' FA249 motor platform fan coupling & casing W side @ 1m	82	81	80	79	81	80	82	82	80	81	82	81	79	79	3	2	0	0	2	1	1	2	3	3
	15 FA249 1m motor end	84	82	79	78	81	80	82	81	80	81	81				5	3	2	3	4	3	3			
	16 FA249 end at column 4.3m N of motor plinth	84	83	77	77	79	78	80	79	77	79	81	82	82		7	6	4	6	7	5	4	3	2	
	18' FA249 platform S side under discharge duct E side	77	76	73	72	75	74	74								5	2	3							
	20 FA 249 S side @ 10.9m	75	74	71	71	72	71	73	72	72	73	73	73			4	4	3	3	3	2	2	2		
	21 FA249 E side of fan casing ground level @ 2m	75	73	71	71	77	76	76	76	76	76	77	76	79		4	-2	-2	-1	-1	-1	-3	-1	-4	
FA250	22 FA250 S side 4.2 m to motor end	86	84	79	78	80	79	83	79	78						7	6	2	7	7					
	23' FA250 E side centre motor @ 1m	84	83	83	83	82	82	84	85	80	85	86				1	2	0	-1	4	-1	-2			
	25 FA250 coupling & casing W side motor centre @1m	84	83	84	83	82	82	86	84	80	85	86				0	1	-2	-1	4	-1	-2			
	29 FA250 E side under discharge duct @ 1.5m, at lower step of concrete	84	83	80	79	81	80	82	82							4	3	3	2						
	26 FA250 W side casing @ 1m & coupling @ 3m	83	82	81	81	82	81	83	81	79	83	83	84	85	81	2	1	0	1	4	0	0	-1	-2	2
	27 FA250 W side 1m under inlet casing expansion joint	82	81	79	78	79	79	83	80	78	85	84				3	3	0	2	4	-3	-2			
RM7 Roof	Lower platform E side 1m to Magnete plate	90	89	92	91	89	88	86	89	83	88	87	85	88	90	-2	1	4	1	7	2	4	5	2	0
	Lower platform S side @ 1m to magnete plate	91	90	93	92	92	91	89	90	82	91	91	87	91	93	-2	-1	2	2	10	0	0	4	0	-2
	Lower platform W side @ 0.9m to magnete plate	90	89	91	90	89	88	86	88	81	87	85				-1	1	4	2	9	3	5			
	Lower platform N side @ 1m to magnete plate	89	88	91	90	90	88	88		84	92	84	85	84	86	-2	-1	2		5	-2	5	4	5	3
	Lower platform N side @ 1m to BE casing	85	84	86	84	85	83	83	84	83	86	81				-1	0	3	1	3	-1	4			
	Platform S of Magnete 2m to S side	86	85	88	86	78	77	85	87							-1	8	2	0						
	Platform S of Magnete 2m to S side	87	86	88	86	78	77	85	87							-1	9	2	0						
	Lower platform N side @ 1m to BE casing	85	84	86	84	85	83	83	84	83	86	81				-1	0	3	1	3	-1	4			
	Upper Platform Gbox @ 1m E side & 0.5m casing	82	81	81	80	82	81	80	81	77	80	79				0	0	2	0	4	2	3			
	Upper Platform Gbox @ 1m N side	82	81	81	81	82	81	81	83	81	83					1	0	1	-1	1	-1				
	Upper Platform motor end @ 1m W side	82	81	82	80	82	81	80	81							1	0	2	2						
	Upper Platform BE casing @ 0.9m W side	82	80	81	80	80	79	78	79	78	81	79	78	81	82	0	1	4	3	4	1	3	3	1	-1
RM7 Bh area	Upper Platform BE casing @ 1m S side	85	84	88	85	87	84	84	81	83	85	83	78	80	85	-2	-1	2	5	3	0	2	8	5	0
	On tower to baghouse top S side above FA249 same level as roof RM7	72	70	68	68	71	70	74	70	69	70	71	71			4	1	-2	3	3	2	1	1		
RM7 bh area	Baghouse S doorway open	81	73	78	71	80	75	81	80	78	72	87	96	73		3	1	0	1	3	9	-6	-15	8	
	L0 Inside man door N side	92	91	93	91	88	87	94								0	5	-2							
RM7 Inside																									
RM7 bh hopper	N end Sc211 but S of duct	80	79	78	78	76	75	84								1	4	-4							
Kiln 6 South side coal road	35 Coal Road S side E side new PHT	71	70	68	68	67	66	68	68	70	68	71	70	70	69	2	4	2	2	1	2	0	1	1	2
	35 Coal Road S side E side new PHT	71	70	67	67											3									
	36 Coal Road S side E side drive platform	72	70	67	66	67	67	69	68	70	69	70	70	71	70	5	4	3	4	2	3	2	2	1	2
	43 Coal Road S side W side coal receival bin 25m to truck	71	69	68	67	64	63	67	64							3	7	4	7						
Fence S	Top N edge bank Opposite E side old PHT	60	59	56	55											4									
Kiln 6 S side Coal Mill Room Area	43A Kerb E side CM opp CM fan discharge	77	76	72	72	75	74	80	77	78	79	78				5	2	-3	0	-1	-2	-1			
	44' CM S wall E door @1m,	88	87	85	85	92	92	83								2	-4	5							
	45 CM S roll door and wall vent @ 9.9m S side	80	79	75	75	78	78	78	76	79	78					4	2	2	4	1	2				
	46 CM room wall vent @ 2m	84	84	80	79											4									
	46 CM room wall vent @ 2m	84	84	82	82	77	77	82	81	86	80	83	89	90		2	7	3	4	-2	4	1	-5	-6	
Kiln 6 S side Coal Mill Room Area	44A Under Coal Mill fan discharge	88	88	85	84											4									

Table 3.3A: K6 Upgrade Compare 2019 to previous p.1

Table 3.3A: Boral Cement Berrima Annual Noise 2019 - Locations with increased LAeq results compared to those of Previous Years for Kiln 6 Upgrade

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results									
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009
Kiln 6 South side	51 Half way between Centre & Western pedestals, by duct support trestle	81	80	79	79	76	76	77	81	80	80	83	82	81	80	2	5	4	0	1	1	-2	-2		
	52A Opp E end of kiln drive platform	81	81	76	76	77	76	78	79	78	78	83	80	80	80	5	4	4	2	3	3	-1	2	1	1
	52 Opp W pedestal roller	82	82	76	76	76	75	76	79	76	76					6	7	7	4	6	6				
	53 Kiln drive platform Centre E end on platform (ground level)	85	85	81	80	74	73	87	88	88						5	11	-2	-3	-3					
Kiln 6 road Northern side	64 E end drive platform	83	83	79	79	78	77	79	82	78	80	82	82			4	5	4	1	5	3	1	1		
	65 Opp column for return duct W side	85	84	81	81	80	80	81	85	81	86	85	85	82	83	3	4	3	0	4	-2	0	0	3	2
	66 Opp centre pedestal	88	87	86	85	85	85	85	87	84	83	88	88	85	85	2	3	3	1	4	5	0	-1	3	3
Grate Cooler Fan Courtyard	69 Centre courtyard - opposite F201	93	93	88	88	85	85	89	89	88	88	88	89	87	88	5	8	4	4	5	5	5	4	6	5
	69 Centre courtyard - opposite F203	93	92	88	88	85	85	89	89	88	88	88	89	87	88	5	7	4	4	5	5	5	4	6	5
	FA201 @ 2m	96	96	90	89	90	90	90	91							6	6	6	5						
	FA201 N side inlet & casing @ 1m	98	98	91	91	92	91									7	6								
	Between FA201 & 203 & 202	99	98	93	93	94	93	93	93	93	87	88	89	87	88	6	5	5	6	6	11	11	10	12	11
	FA203 inlet & casing @ 2m	93	93	89	89	89	89	89	90							4	4	5	3						
	FA203,FA204 & FA205 @ 1m	92	92	89	88											4									
Kiln Firing Floor	Centre N side opening face E	85	82	85	82	85	83	82	83	83	81		86	83		0	0	3	2	2	4		-1	2	
	FA210 Kiln Discharge Seal Fan S inlet @ 1.5m	92	92	92	91	92	92	94	95	85	96	94	96	92		0	0	-2	-3	7	-3				
	FA200 inlet side @ 1.5m	89	89	87	86	87	87	85	87							3	2	4	2						
Radicon Cooler	RC L1 S fan @ 0.5m	87	86	83	83	90	90	92	84		95					4	-3	-5	2		-8				
	RC L4 Centre fan @ 1m	85	84	85	84	95	95	92	92	92	88	82	88	85	84	1	-10	-7	-7	-7	-3	3	-3	0	1
Control Building Roof	Admin Building Roof NE corner opp FA502 & CM7	72	71	70	70	72	71	68								2	0	4							

Table 3.4: Boral Cement Berrima Works
2019 Annual Environmental Noise Assessment for Kiln 6 Upgrade -
Measurement locations with increase in sound level > 3 dB and calculated contribution sound level at receivers

Location	Year	Time	Period sec	Sound Level dB(A) L _{AEQ,t}	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	Argyle	South
Kiln 6 Upgrade						Objective	37	37	37	37	37
PHT L8 Top platform EL16 Gbox @ 2m to motor S side	2019	11:00 AM	31	78		2	666	754	745	890	1506
	2017			73	Source after directivity		77	77	77	77	59
<i>Difference 2019 - 2017</i>			<i>Difference</i>	4	Distance reduction		-50	-52	-51	-53	-58
					<i>Calculated SPL without barriers</i>		27	26	26	24	2
PHT Level 8 FA263 motor & casing F231	2019	11:09 AM	30	88	Distance	1	666	754	745	890	1506
	2012			81	Source after directivity		88	88	88	88	66
<i>Difference 2019 - 2012</i>			<i>Difference</i>	7	Distance reduction		-56	-58	-57	-59	-64
					<i>Calculated SPL without barriers</i>		32	31	31	29	2
EL13 platform motor end @ 0.6m	2019	11:38 AM	23	85	Distance	1	666	754	745	890	1506
	2016			74	Source after directivity		61	61	61	60	60
<i>Difference 2019 - 2016</i>			<i>Difference</i>	11	Distance reduction		-56	-58	-57	-59	-64
					<i>Calculated SPL without barriers</i>		5	4	4	1	-3
PHT Level 4 old centre S side by stairs	2019	12:27 PM	42	82	Distance	8	666	754	745	890	1506
	2018			76	Source after directivity		82	82	82	82	82
<i>Difference 2019 - 2018</i>			<i>Difference</i>	6	Distance reduction		-38	-39	-39	-41	-45
Level included air blaster. L90 was 77, same as 2018					<i>Calculated SPL without barriers</i>		43	42	42	41	36
PHT Level 4 centre between towers by air cannon @ 2m	2019	12:32 PM	31	77	Distance	2	666	754	745	890	1506
	2018			73	Source after directivity		76	76	76	76	76
<i>Difference 2019 - 2018</i>			<i>Difference</i>	3	Distance reduction		-50	-52	-51	-53	-58
					<i>Calculated SPL without barriers</i>		20	19	19	18	13
PHT Level 4 new centre S side	2019	12:34 PM	47	76	Distance	5	666	754	745	890	1506
	2017			71	Source after directivity		76	76	76	76	76
<i>Difference 2019 - 2017</i>			<i>Difference</i>	5	Distance reduction		-42	-44	-43	-45	-50
					<i>Calculated SPL without barriers</i>		34	33	33	31	27
ESP top NE corner at barrier	2019	12:41 PM	31	73	Distance	10	642	730	711	850	1485
	2016			70	Source after directivity		58	56	54	51	54
<i>Difference 2019 - 2018</i>			<i>Difference</i>	4	Distance reduction		-36	-37	-37	-39	-43
					<i>Calculated SPL without barriers</i>		22	19	17	13	10
PHT Level 3 old centre E side above kiln	2019	12:47 PM	32	79	Distance	1	666	754	745	890	1506
	2017			74	Source after directivity		79	79	79	79	79
<i>Difference 2019 - 2017</i>			<i>Difference</i>	5	Distance reduction		-56	-58	-57	-59	-64
					<i>Calculated SPL without barriers</i>		23	22	22	20	16
PHT Level 2.25 by centre by kiln entry	2019	12:52 PM	42	88	Distance	1	666	754	745	890	1506
	2017			83	Source after directivity		88	88	88	88	88
<i>Difference 2019 - 2017</i>			<i>Difference</i>	5	Distance reduction		-56	-58	-57	-59	-64
Air cannon event in period. LA90 88 same as in 2014					<i>Calculated SPL without barriers</i>		31	30	30	29	24
PHT Level 2 FA63 discharge @ 1.5m faces WSW	2019	1:02 PM	29	89	Distance	1.5	692	778	758	886	1459
	2014			85	Source after directivity		80	80	82	84	89
<i>Difference 2019 - 2014</i>			<i>Difference</i>	4	Distance reduction		-53	-54	-54	-55	-60
					<i>Calculated SPL without barriers</i>		27	26	28	28	29
PHT Level 2 FA65 inlet filter @ 1m in front	2019	1:04 PM	31	87	Distance	1	666	754	745	890	1506
	2014			84	Source after directivity		87	87	87	87	74
<i>Difference 2019 - 2014</i>			<i>Difference</i>	3	Distance reduction		-56	-58	-57	-59	-64
This source is not causing the sound level - it is other sources, lower than 2018					<i>Calculated SPL without barriers</i>		31	30	30	28	10
FA39 S side @ columns 2.7m to bearing	2019	2:15 PM	31	87	Distance	2.7	656	748	725	875	1508
	2018			83	Source after directivity		55	57	57	57	87
<i>Difference 2019 - 2018</i>			<i>Difference</i>	4	Distance reduction		-48	-49	-49	-50	-55
Increase is from screw conveyor squeal in the area					<i>Calculated SPL without barriers</i>		7	8	9	7	32
1 RM6 W door @ 1m	2019	2:31 PM	31	78	Distance	1	660	729	707	826	1486
	2013			70	Source after directivity		60	60	64	68	64
<i>Difference 2019 - 2013</i>			<i>Difference</i>	8	Distance reduction		-56	-57	-57	-58	-63
Is lower than 2018					<i>Calculated SPL without barriers</i>		3	3	7	9	0
14 FA249 2m W side ground level	2019	10:03 AM	32	89	Distance	2	703	792	772	907	1455
	2018			77	Source after directivity		72	76	76	79	76
<i>Difference 2019 - 2018</i>			<i>Difference</i>	12	Distance reduction		-51	-52	-52	-53	-57
Increases in all FA249 area from screw conveyor noise					<i>Calculated SPL without barriers</i>		21	24	24	26	18
22 FA250 S side 4.2 m to motor end	2019	10:18 AM	52	86	Distance	1	677	765	751	885	1483
	2018			79	Source after directivity		54	57	57	57	86
<i>Difference 2018 - 2014</i>			<i>Difference</i>	7	Distance reduction		-57	-58	-58	-59	-63
Increases in all FA250 area from screw conveyor noise					<i>Calculated SPL without barriers</i>		-3	-1	-1	-2	22
RM7 roof Lower platform E side 1m to Magnete plate	2019	10:32 AM	30	90	Distance	1	692	778	758	886	1459
	2014			83	Source after directivity		76	71	69	67	71
<i>Difference 2019 - 2014</i>			<i>Difference</i>	7	Distance reduction		-57	-58	-58	-59	-63
Is lower than 2018					<i>Calculated SPL without barriers</i>		19	14	12	8	8

Table 3.4: Boral Cement Berrima Works
2019 Annual Environmental Noise Assessment for Kiln 6 Upgrade -
Measurement locations with increase in sound level > 3 dB and calculated contribution sound level at receivers

Location	Year	Time	Period sec	Sound Level dB(A) L _{AEQ,t}	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	Argyle	South
Kiln 6 Upgrade						Objective	37	37	37	37	37
RM7 roof Lower platform S side @ 1m to magnete plate	2019	10:33 AM	31	91	Distance	1	692	778	758	886	1459
	2014			82	Source after directivity		59	61	61	63	91
<i>Difference 2019 - 2014</i>			<i>Difference</i>	10	Distance reduction		-57	-58	-58	-59	-63
<i>Is lower than 2018</i>					<i>Calculated SPL without barriers</i>		2	3	3	4	28
RM7 Roof Lower platform W side @ 1m to magnete plate	2018	10:34 AM	31	89	Distance	0.9	692	778	758	886	1459
	2014			81	Source after directivity		75	79	79	82	86
<i>Difference 2018 - 2014</i>			<i>Difference</i>	8	Distance reduction		-58	-59	-59	-60	-64
					<i>Calculated SPL without barriers</i>		18	20	20	22	22
RM7 Roof Lower platform N side @ 1m to magnete plate	2019	10:35 AM	31	89	Distance	1	692	778	758	886	1459
	2012			84	Source after directivity		89	89	89	89	60
<i>Difference 2019 - 2012</i>			<i>Difference</i>	5	Distance reduction		-57	-58	-58	-59	-63
					<i>Calculated SPL without barriers</i>		32	31	32	30	-3
<i>Next item for 1m N of BE is 4 dB lower so assume results for it are 4 dB lower than for this one</i>											
RM7 roof Platform S of Magnete 2m to S side	2019	10:38 AM	30	87	Distance	2	685	779	756	882	1452
	2017			78	Source after directivity		55	58	58	60	87
<i>Difference 2019 - 2017</i>			<i>Difference</i>	9	Distance reduction		-51	-52	-52	-53	-57
					<i>Calculated SPL without barriers</i>		5	6	6	7	30
RM7 Roof Upper Platform Gbox @ 1m E side & 0.5m casing	2019	10:41 AM	30	82	Distance	0.5	692	778	758	886	1459
	2014			77	Source after directivity		72	72	69	68	68
<i>Difference 2019 - 2014</i>			<i>Difference</i>	4	Distance reduction		-63	-64	-64	-65	-69
					<i>Calculated SPL without barriers</i>		9	8	6	3	-1
RM7 Roof Upper Platform BE casing @ 0.9m W side	2019	10:43 AM	26	82	Distance	0.9	692	778	758	886	1459
	2016			78	Source after directivity		72	74	74	76	78
<i>Difference 2019 - 2016</i>			<i>Difference</i>	4	Distance reduction		-58	-59	-59	-60	-64
					<i>Calculated SPL without barriers</i>		14	15	15	16	14
RM7 Roof Upper Platform BE casing @ 1m S side	2019	10:44 AM	30	85	Distance	1	692	778	758	886	1459
	2011			78	Source after directivity		58	60	60	61	85
<i>Difference 2019 - 2011</i>			<i>Difference</i>	8	Distance reduction		-57	-58	-58	-59	-63
					<i>Calculated SPL without barriers</i>		1	2	2	2	22
On tower to baghouse top S side above FA249 same level as roof RM7	2019	10:48 AM	25	72	Distance	5	703	792	772	907	1455
	2018			68	Source after directivity		53	53	55	56	72
<i>Difference 2019 - 2018</i>			<i>Difference</i>	4	Distance reduction		-43	-44	-44	-45	-49
					<i>Calculated SPL without barriers</i>		10	9	11	11	23
RM7 Baghouse S doorway open	2019	10:51 AM	60	81	Distance	1	671	772	775	937	1557
	2013			72	Source after directivity		56	56	63	67	81
<i>Difference 2018 - 2013</i>			<i>Difference</i>	9	Distance reduction		-57	-58	-58	-59	-64
					<i>Calculated SPL without barriers</i>		0	-2	5	7	17
<i>Significant barriers in place for all village receivers</i>											
RM7 Baghouse hopper area - N end SC211 but S of duct	2019	11:54 AM	34	80	Distance	1	671	772	775	937	1557
	2017			76	Source after directivity		58	58	60	62	80
<i>Difference 2019 - 2017</i>			<i>Difference</i>	4	Distance reduction		-57	-58	-58	-59	-64
					<i>Calculated SPL without barriers</i>		2	1	2	2	16
<i>Significant barriers in place for all village receivers</i>											
35 Coal Road S side E side new PHT	2019	12:15 PM	61	70	Distance	80	770	877	885	1000	1530
	2018			67	Source after directivity		35	35	35	40	70
<i>Difference 2019 - 2018</i>			<i>Difference</i>	3	Distance reduction		-20	-21	-21	-22	-26
<i>Possibly air cannon in measurement</i>					<i>Calculated SPL without barriers</i>		15	14	14	18	44
36 Coal Road S side E side drive platform	2019	12:16 PM	60	71	Distance	80	692	782	765	905	1473
	2018			67	Source after directivity		35	35	35	39	72
<i>Difference 2019 - 2018</i>			<i>Difference</i>	4	Distance reduction		-19	-20	-20	-21	-25
<i>Potentially more KSCFs running than 2018</i>					<i>Calculated SPL without barriers</i>		16	15	15	18	46
43 Coal Road S side W side coal receival bin 25m to truck	2019	4:25 PM	41	71	Distance	25	770	877	885	1000	1530
	2017			64	Source after directivity		35	35	35	39	72
<i>Difference 2019 - 2017</i>			<i>Difference</i>	7	Distance reduction		-30	-31	-31	-32	-36
<i>Coal conveyor working</i>					<i>Calculated SPL without barriers</i>		5	4	4	7	36
Top N edge bank Opposite E side old PHT	2019	12:40 PM	60	71	Distance	21	860	950	930	1000	1350
	2018			67	Source after directivity		26	26	26	31	60
<i>Difference 2019 - 2018</i>			<i>Difference</i>	4	Distance reduction		-32	-33	-33	-34	-36
<i>Assumes source is Alt Fuels</i>					<i>Calculated SPL without barriers</i>		-6	-7	-7	-3	24
43A Kerb E side CM opp CM fan discharge	2019	3:44 PM	38	77	Distance	18	715	810	820	930	1545
	2018			72	Source after directivity		64	62	60	60	62
<i>Difference 2019 - 2018</i>			<i>Difference</i>	5	Distance reduction		-32	-33	-33	-34	-39
<i>Significant barriers in path</i>					<i>Calculated SPL without barriers</i>		32	29	27	26	24

Pink shaded cells and red text indicates exceeds contribution objective by 3dB+

Table 3.4 p2

Increase table 2019: Increases from previous for 2019

Table 3.4: Boral Cement Berrima Works
2019 Annual Environmental Noise Assessment for Kiln 6 Upgrade -
Measurement locations with increase in sound level > 3 dB and calculated contribution sound level at receivers

Location	Year	Time	Period sec	Sound Level dB(A) L _{AEQ,T}	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	Argyle	South
Kiln 6 Upgrade						Objective	37	37	37	37	37
44' CM S wall E door @1m,	2019	3:48 PM	33	88	Distance	1	715	810	820	930	1545
	2016			83	Source after directivity		59	62	62	65	84
<i>Difference 2019 - 2016</i>			<i>Difference</i>	5	Distance reduction		-57	-58	-58	-59	-64
Significant barriers in place for all village receivers					<i>Calculated SPL without barriers</i>		2	4	4	5	20
45 CM S roll door and wall vent @ 9.9m S side	2019	3:49 PM	35	80	Distance	9	715	810	820	930	1545
	2017			75	Source after directivity		45	45	47	50	74
<i>Difference 2019 - 2017</i>			<i>Difference</i>	4	Distance reduction		-38	-39	-39	-40	-45
Significant barriers in place for all village receivers					<i>Calculated SPL without barriers</i>		7	6	7	10	29
46 CM room wall vent @ 2m	2019	3:50 PM	32	84	Distance	2	715	810	820	930	1545
	2017			77	Source after directivity		53	56	56	59	80
<i>Difference 2019 - 2017</i>			<i>Difference</i>	7	Distance reduction		-51	-52	-52	-53	-58
Significant barriers in place for all village receivers					<i>Calculated SPL without barriers</i>		2	4	4	6	22
K6 S side 51 Half way between Centre & Western pedestals, by duct support trestle	2019	4:00 PM	34	85	Distance	13	684	782	783	942	1534
	2017			76	Source after directivity		52	55	55	58	77
<i>Difference 2018 - 2016</i>			<i>Difference</i>	9	Distance reduction		-34	-36	-36	-37	-41
Significant barriers in place for all village receivers.					<i>Calculated SPL without barriers</i>		17	19	19	20	36
52 Opp W pedestal roller	2019	4:01 PM	32	82	Distance	6	672	747	760	908	1511
	2016			76	Source after directivity		45	45	49	53	80
<i>Difference 2019 - 2016</i>			<i>Difference</i>	7	Distance reduction		-41	-42	-42	-44	-48
					<i>Calculated SPL without barriers</i>		4	3	7	9	32
K6 S side #53 Kiln drive platform Centre E end on platform (ground level)	2019	4:10 PM	32	85	Distance	1.5	676	773	770	923	1521
	2017			74	Source after directivity		50	50	57	62	85
<i>Difference 2019 - 2017</i>			<i>Difference</i>	11	Distance reduction		-53	-54	-54	-56	-60
Reason for difference unclear, potentially more KSCFs, no consequence					<i>Calculated SPL without barriers</i>		-3	-4	3	7	25
K6 N side 64 E end drive platform	2019	2:44 PM	51	83	Distance	13	659	734	747	895	1524
	2014			78	Source after directivity		83	83	83	80	54
<i>Difference 2019 - 2014</i>			<i>Difference</i>	5	Distance reduction		-34	-35	-35	-37	-41
Increase may be more new centre fans operating					<i>Calculated SPL without barriers</i>		49	48	48	44	13
K6 N side #66 Opp centre pedestal	2019	2:46 PM	31	88	Distance	13	664	761	758	911	1533
	2013			83	Source after directivity		88	88	88	85	58
<i>Difference 2019 - 2013</i>			<i>Difference</i>	5	Distance reduction		-34	-35	-35	-37	-41
Increase may be more new centre fans operating					<i>Calculated SPL without barriers</i>		53	52	52	48	17
69 Centre courtyard - opposite F203	2019	2:49 PM	30	93	Distance	4	671	772	775	937	1557
	2017			85	Source after directivity		93	93	93	93	71
<i>Difference 2019 - 2017</i>			<i>Difference</i>	7	Distance reduction		-44	-46	-46	-47	-52
Large increase compared to previous. Significant barriers to receivers					<i>Calculated SPL without barriers</i>		48	47	47	45	19
Grate cooler fan courtyard FA201 N side inlet & casing @ 1m	2019	2:52 PM	31	98	Distance	1	671	772	775	937	1557
	2018			91	Source after directivity		98	98	98	98	74
<i>Difference 2019 - 2017</i>			<i>Difference</i>	7	Distance reduction		-57	-58	-58	-59	-64
Large increase compared to previous. Significant barriers to receivers					<i>Calculated SPL without barriers</i>		41	40	40	38	11
Kiln firing floor Centre N side opening facing E	2019	2:59 PM	60	85	Area 20, Distance 1	1	671	772	775	937	1557
	2013			81	Source after directivity		71	74	74	85	85
<i>Difference 2019 - 2013</i>			<i>Difference</i>	4	Distance reduction		-57	-58	-58	-59	-64
No increase from 2017					<i>Calculated SPL without barriers</i>		14	17	17	25	21
FA200 inlet side @ 1.5m	2019	3:08 PM	32	89	Distance	1.5	671	772	775	937	1557
	2016			85	Source after directivity		89	89	89	89	89
<i>Difference 2018 - 2013</i>			<i>Difference</i>	4	Distance reduction		-53	-54	-54	-56	-60
Barrier to village receivers					<i>Calculated SPL without barriers</i>		36	35	35	33	29
FA210 Kiln Discharge Seal Fan S inlet @ 1m E side	2019	3:05 PM	31	92	Distance	1.5	683	784	787	949	1545
	2014			85	Source after directivity		77	75	75	69	69
<i>Difference 2019 - 2014</i>			<i>Difference</i>	7	Distance reduction		-53	-54	-54	-56	-60
Barrier to village side					<i>Calculated SPL without barriers</i>		23	20	20	13	9
RC L1 S fan @ 0.5m	2019	3:17 PM	30	87	Distance	0.5	672	773	778	942	1562
	2018			83	Source after directivity		77	77	80	83	77
<i>Difference 2019 - 2018</i>			<i>Difference</i>	4	Distance reduction		-63	-64	-64	-66	-70
					<i>Calculated SPL without barriers</i>		14	13	16	18	7
RC L4 Centre fan @ 1m	2019	3:24 PM	32	85	Distance	1	574	673	677	845	1629
	2012			82	Source after directivity		75	75	78	81	75
<i>Difference 2019 - 2018</i>			<i>Difference</i>	3	Distance reduction		-55	-57	-57	-59	-64
					<i>Calculated SPL without barriers</i>		19	18	21	23	10

Table 3.5: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Cement Mill No.7 and CM6

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
CM7	A Top of stairs S	124	10/09/2019	2:13 PM	32	73	89	74	74	72	16	
	C Top of stairs N	635	2/10/2019	3:42 PM	30	72	82	74	73	71	11	2/10/2019 RM6 Off
	A Top of stairs S	636	2/10/2019	3:43 PM	30	73	84	75	74	72	11	2/10/2019 RM6 Off
	B 2m W of wall, edge of barrier facing baghouse	637	2/10/2019	3:44 PM	37	75	91	76	76	75	16	2/10/2019 RM6 Off
	B 2m W of wall, edge of barrier facing baghouse	134	10/09/2019	2:30 PM	33	79	93	80	80	78	14	2.8m from lource - panel vibrating
	B' 1m S of mill motor fan discharge, @ 1.7m above ground	638	2/10/2019	3:45 PM	30	77	92	79	78	77	14	2/10/2019 RM6 Off
	C Top of stairs N	125	10/09/2019	2:14 PM	34	72	83	74	73	72	11	
	D At corner N of Admin	126	10/09/2019	2:16 PM	53	74	83	76	75	73	10	27 m from building
	E Compressor room door @ 1m	128	10/09/2019	2:20 PM	34	70	85	72	71	70	15	
	E' Man door to compressor filter room@ 1m	127	10/09/2019	2:19 PM	32	69	84	70	70	69	15	
	F Wall vents N on W side @ 1m	129	10/09/2019	2:22 PM	31	75	87	76	76	75	12	
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7	142	10/09/2019	2:42 PM	33	74	83	76	75	73	9	16m from building
	I Vent S of door @ 1m	131	10/09/2019	2:24 PM	45	76	90	77	77	76	14	
	J Vents N of baghouse	133	10/09/2019	2:28 PM	50	78	96	80	79	78	18	
	J' Edge of concrete opp, J.	136	10/09/2019	2:33 PM	40	76	93	77	77	75	18	8.8m from building
	H W roller door @ 1m	632	2/10/2019	3:39 PM	44	81	88	85	85	80	7	2/10/2019 RM6 Off
	H W roller door @ 1m	130	10/09/2019	2:23 PM	31	79	91	80	79	79	12	
	H' Edge concrete opp door H	132	10/09/2019	2:25 PM	32	73	87	75	74	73	14	9m from building
	H' Edge concrete opp door H	633	2/10/2019	3:40 PM	36	74	84	76	75	74	10	2/10/2019 RM6 Off
	K Line level with G centre of compressor house	141	10/09/2019	2:41 PM	45	72	82	74	74	72	10	15.6m from building
	L N wall vent W side @ 1m	137	10/09/2019	2:36 PM	36	72	82	73	73	71	11	outside filter room
	M Between wall vents @ 1m to wall	138	10/09/2019	2:37 PM	31	71	81	73	73	70	11	3.76m outside filter room (obstacle in way)
	N Wall vents N wall E side @ 1m	139	10/09/2019	2:39 PM	32	71	82	72	72	70	11	outside filter room
	Bottom of stairs N	634	2/10/2019	3:41 PM	30	72	82	74	73	72	10	2/10/2019 RM6 Off
	O Line E side of Comp House 13.5m to control point	140	10/09/2019	2:40 PM	43	72	82	73	73	71	10	15m from building
	P 1m N roll door CM7	145	10/09/2019	2:48 PM	43	80	89	81	81	80	9	
	Under TS3 ground level 13.8 m from CM7	143	10/09/2019	2:45 PM	32	72	85	74	73	72	13	ground level 13.8 m from CM7
	Transfer Station #TS3 Level 1 N side opening	188	10/09/2019	4:57 PM	33	74	83	76	75	74	9	north side platform 2m above ground
	TS3 Platform opp fan discharge	189	10/09/2019	5:01 PM	37	74	84	75	75	74	9	Platform Level
	R corner SW of CM7	176	10/09/2019	3:40 PM	34	76	90	78	78	75	14	17m to building
	R corner SW of CM7	602	2/10/2019	3:08 PM	35	75	87	76	76	74	12	2/10/2019 RM6 Off
	S' Kerb Opp W wall CM7	175	10/09/2019	3:38 PM	39	75	89	76	75	74	14	15m to building 7.6 to fence
	S' Kerb Opp W wall CM7	603	2/10/2019	3:09 PM	31	74	87	76	75	73	13	2/10/2019 RM6 Off
	S Kerb opp W side CM7 tower	604	2/10/2019	3:10 PM	32	72	83	74	73	72	11	2/10/2019 RM6 Off
	S Kerb opp E side CM7 tower	174	10/09/2019	3:37 PM	32	75	89	77	76	75	13	
	S Kerb opp E side CM7 tower	605	2/10/2019	3:10 PM	30	72	83	74	73	72	10	2/10/2019 RM6 Off
	T Kerb Opp W wall CM5	173	10/09/2019	3:36 PM	41	76	86	76	76	75	11	10m to building
	T Kerb Opp W wall CM5	606	2/10/2019	3:11 PM	30	73	84	75	74	73	11	2/10/2019 RM6 Off

Table 3.5: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Cement Mill No.7 and CM6

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
CM7 Inside	H* Inside main W roll door @ 1m	435	10/09/2019	4:55 PM	33	95	99	95	95	94	5	
	F* Inside NW corner	436	10/09/2019	4:56 PM	52	92	97	93	92	91	5	
	I* W side by hydraulics bench	437	10/09/2019	4:57 PM	30	94	99	96	95	94	5	
	J* inside vents	438	10/09/2019	4:58 PM	35	92	98	93	92	91	6	
	J* SW corner by vents at baghouse	439	10/09/2019	4:59 PM	55	89	97	91	90	89	8	
	N end under centre axis, ground level	446	10/09/2019	5:06 PM	30	96	99	97	97	96	3	
	N end ground @ 2m	440	10/09/2019	5:00 PM	33	94	98	95	95	93	4	
	Centre axis N end @ 2m	441	10/09/2019	5:01 PM	45	98	102	99	99	97	4	
	Inside Door P N end of mill building @ 1m	442	10/09/2019	5:02 PM	55	94	98	95	94	93	4	
	Inside E side mill centre at columns N end	443	10/09/2019	5:03 PM	38	100	102	101	101	99	2	
	Inside E side mill centre at columns S end	444	10/09/2019	5:04 PM	31	98	101	99	98	97	4	
	Inside NW corner mill room	445	10/09/2019	5:05 PM	34	92	97	93	92	91	6	
	C701 platform	447	10/09/2019	5:07 PM	31	91	97	92	92	91	5	
	Platform above centre centre mill	448	10/09/2019	5:08 PM	30	92	97	93	92	92	6	
	Inside, above Mill drive gear S end	449	10/09/2019	5:10 PM	30	91	97	92	91	90	6	
	Tower stairs at roof level	450	10/09/2019	5:11 PM	31	89	95	90	90	89	6	
	1st platform above roof level in BE tower W side	451	10/09/2019	5:12 PM	31	86	94	87	86	85	8	
	2nd platform in BE tower by fans FA703 & FA720, W side wall @ 1m	452	10/09/2019	5:13 PM	30	82	91	83	83	82	9	
	Between Fans FA703 on & FA720 on	453	10/09/2019	5:13 PM	30	84	92	85	84	83	8	
	At crossway to CM5 level, N side at transfer to conveyor	454	10/09/2019	5:14 PM	31	82	91	83	82	81	9	
	At crossway to CM5 level, W side by wall @ 1m, BE @ 1.8m	455	10/09/2019	5:15 PM	30	82	90	83	82	81	8	
	At W end crossway to CM5 by vent in S wall	456	10/09/2019	5:16 PM	33	79	89	79	79	78	11	
	Top level BE tower W side NW corner	459	10/09/2019	5:18 PM	30	83	91	84	84	82	8	
	Top level BE tower S side BE @ 0.8m	460	10/09/2019	5:19 PM	33	82	91	84	83	81	9	
	Top level BE tower E side by drive motor end @ 0.8m	461	10/09/2019	5:20 PM	28	84	92	85	84	83	9	Squeaky bucket elevator noise
	Top level BE tower N side by drive motor end @ 0.8m	462	10/09/2019	5:21 PM	31	83	92	84	84	83	9	Squeaky bucket elevator noise
	Crossway to CM5 E end by opening in floor	457	10/09/2019	5:17 PM	26	76	90	78	77	76	14	
	Crossway to CM5 by centre S wall vent	458	10/09/2019	5:18 PM	19	77	89	77	77	76	13	
	Main baghouse SE corner top, 4m to E wall	464	10/09/2019	5:25 PM	32	83	95	84	84	83	12	
	Main baghouse NE corner top, 4m to E wall	465	10/09/2019	5:26 PM	32	84	92	86	85	84	8	
	Base of main baghouse SW corner	463	10/09/2019	5:23 PM	31	85	98	86	86	85	13	
	CM7 FA701 motor & casing NE side @ 1.5m	467	10/09/2019	5:28 PM	24	89	98	90	90	89	9	
	Compressor house inside W man door	468	10/09/2019	5:30 PM	30	95	94	96	96	95	-1	Purge 95
	Compressor house inside by centre purge filter	469	10/09/2019	5:31 PM	30	90	90	91	91	89	0	Purge 90 reduced
	Compressor house inside E man door	470	10/09/2019	5:32 PM	30	75	86	76	76	75	11	No purge
	Compressor house inside centre	471	10/09/2019	5:33 PM	30	76	88	79	79	75	11	no purge, 1 extra compressor on
	Compressor house inside W man door	472	10/09/2019	5:33 PM	30	75	86	77	76	75	11	No purge
	E Outside W roll door compressor house	473	10/09/2019	5:34 PM	30	70	84	71	71	70	14	no purge, other sources are the noise contribution
	SW side of mill motor fan @ 2m to casing inlet & discharge ducts	466	10/09/2019	5:27 PM	30	86	96	87	87	85	10	

Table 3.5: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Cement Mill No.7 and CM6

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
CM6	1 North West Corner @ 1m	146	10/09/2019	2:50 PM	34	79	95	80	80	79	16	10/09/2019
	2 Front of Roller Door @ 1m	626	2/10/2019	3:33 PM	35	87	94	89	88	87	7	2/10/2019 RM6 Off
	2 Front of Roller Door @ 1m	147	10/09/2019	2:51 PM	37	80	92	81	81	80	11	Door open
	3 Between Door @ 1m	627	2/10/2019	3:34 PM	23	80	90	81	81	80	10	2/10/2019 RM6 Off
	3 Between Door @ 1m	148	10/09/2019	2:53 PM	34	79	89	80	80	78	11	
	4 Front of Roller Door @ 1m	149	10/09/2019	2:54 PM	31	81	91	82	82	81	9	
	4 Front of Roller Door @ 1m	628	2/10/2019	3:35 PM	32	81	91	82	82	81	9	2/10/2019 RM6 Off
	5 Front of Southern Roller Door @ 1m	150	10/09/2019	2:55 PM	48	80	89	81	81	80	10	
	5 Front of Southern Roller Door @ 1m	629	2/10/2019	3:35 PM	30	81	90	82	82	81	9	2/10/2019 RM6 Off
	6 Northern face of western ext. @ 1m	151	10/09/2019	2:57 PM	33	78	89	79	79	77	11	1m from both walls
	7 On CM5 Platform (N) @ 6.8m	155	10/09/2019	3:03 PM	31	77	87	78	78	77	9	6.9m from CM6
	8 Western face (N) of western ext. @ 1m	152	10/09/2019	2:58 PM	31	76	90	77	77	76	14	
	9 Western face(S) of western ext. @ 1m	153	10/09/2019	3:00 PM	33	76	89	77	77	76	13	
	10 On CM5 Platform (S) @ 6.8m	154	10/09/2019	3:01 PM	45	77	87	78	78	76	11	6.8m from CM6
	10 On CM5 Platform (S) @ 6.8m	607	2/10/2019	3:14 PM	37	75	86	76	76	75	11	E side of CM5, levelwith S of CM6 - 2/10/2019 RM6 Off
	11 14.5m from S wall at joint	608	2/10/2019	3:15 PM	39	78	84	80	80	76	6	2/10/2019 RM6 Off
	11 14.5m from S wall at joint	157	10/09/2019	3:06 PM	32	76	85	77	77	75	9	14.4m from building
	12 6m from S wall CM6 at joint	156	10/09/2019	3:05 PM	51	80	86	82	82	80	6	2.9m from building - under exhaust
	12 6m from S wall CM6 at joint	609	2/10/2019	3:16 PM	31	79	85	81	81	78	6	2/10/2019 RM6 Off
	13 E side S roll door @ 1m	158	10/09/2019	3:08 PM	40	77	85	78	78	76	8	315 Hz tonal 73.5
	13 E side S roll door @ 1m	610	2/10/2019	3:17 PM	31	77	85	79	78	77	8	2/10/2019 RM6 Off
	14 CM6 E side centre door @ 1m	159	10/09/2019	3:11 PM	32	79	87	80	80	78	9	Door open 200mm from Bottom no tonal
	14 CM6 E side centre door @ 1m	611	2/10/2019	3:18 PM	39	84	91	86	86	84	7	Door open 1m - 2/10/2019 RM6 Off
	15 2m from Clinker Building opp 13 & 14	172	10/09/2019	3:33 PM	42	75	83	76	75	74	8	approx 10m fro CM6
	15 2m from Clinker Building opp 13 & 14	612	2/10/2019	3:19 PM	33	77	85	78	77	76	8	2/10/2019 RM6 Off
	16 E wall centre @ 2m	160	10/09/2019	3:12 PM	32	75	83	75	75	74	8	
	16 E wall centre @ 2m	613	2/10/2019	3:20 PM	33	76	84	77	77	75	8	2/10/2019 RM6 Off
	17 E roll door opp Mill	614	2/10/2019	3:21 PM	39	82	87	83	83	81	5	2/10/2019 RM6 Off
	17 E roll door opp Mill	161	10/09/2019	3:13 PM	32	83	88	84	84	83	5	
	18 Door opp Comp Room @ 1m	615	2/10/2019	3:22 PM	30	81	85	82	82	80	4	Door open bottom 100mm - 2/10/2019 RM6 Off
	18 Door opp Comp Room @ 1m	162	10/09/2019	3:14 PM	72	79	84	82	82	75	5	Door ajar 100mm frequency increasing low to high
	19 Clinker Building @ 2m opp 18	171	10/09/2019	3:31 PM	33	75	83	77	76	75	7	10.2m fro CM6
	19 Clinker Building @ 2m opp 18	616	2/10/2019	3:23 PM	30	74	82	77	76	74	8	2/10/2019 RM6 Off
	20 Inside Filter Room @0.3m	164	10/09/2019	3:18 PM	32	75	86	77	77	75	10	300mm from vent
	20 Man door - open 100mm	163	10/09/2019	3:17 PM	32	74	82	76	75	74	8	1.5m from door- stuck adjar
	20 Man door - open 100mm	617	2/10/2019	3:23 PM	31	75	83	76	76	74	8	Small roller door on Compressor room open 0.5m - 2/10/2019 RM6 Off
	21 1m Outside vent fan filter louvre	165	10/09/2019	3:20 PM	35	74	84	75	75	74	10	
	21 1m Outside vent fan filter louvre	618	2/10/2019	3:24 PM	41	74	85	75	75	73	11	Inside the panel - 2/10/2019 RM6 Off
	22 E side N wall vent @ 1m	619	2/10/2019	3:25 PM	30	81	89	82	82	80	8	2/10/2019 RM6 Off
	22 E side N wall vent @ 1m	166	10/09/2019	3:21 PM	42	81	89	82	82	81	8	
	23 Centre N wall vent @ 1m	620	2/10/2019	3:26 PM	30	84	90	85	85	84	6	2/10/2019 RM6 Off
	23 Centre N wall vent @ 1m	167	10/09/2019	3:22 PM	41	84	90	85	85	84	6	
	24 W side N wall vent @ 1m	621	2/10/2019	3:27 PM	31	81	88	82	81	80	7	2/10/2019 RM6 Off
	24 W side N wall vent @ 1m	168	10/09/2019	3:23 PM	36	80	89	82	81	80	8	
	25 11m N of CM6 at joint	622	2/10/2019	3:28 PM	35	75	84	76	75	74	10	2/10/2019 RM6 Off
	25 11m N of CM6 at joint	169	10/09/2019	3:25 PM	67	74	84	75	74	73	10	13.6m out; door above vent open; wav 53
	26 22.6m N of CM6	623	2/10/2019	3:29 PM	31	71	85	74	72	71	13	Also under conveyor - 2/10/2019 RM6 Off
	26 22.6m N of CM6	170	10/09/2019	3:29 PM	46	71	84	72	72	71	13	22m out; door above vent open;
	27 4m N of Conveyor transfer out of Clinker Building	624	2/10/2019	3:30 PM	30	77	89	83	81	76	12	2/10/2019 RM6 Off
	28 4m N of dust collector on next building W , conveyor transfer noise	625	2/10/2019	3:31 PM	49	77	87	81	80	77	9	2/10/2019 RM6 Off
	Door platform near CM6 W wall fan @ 7m	190	10/09/2019	5:03 PM	32	85	99	87	86	84	15	Platform along conveyor
	Door platform near CM6 W wall fan @ 3.5m	191	10/09/2019	5:05 PM	34	92	105	93	92	91	13	Platform facing exhaust fan 1.78 out to fan 3.5 inside to fan

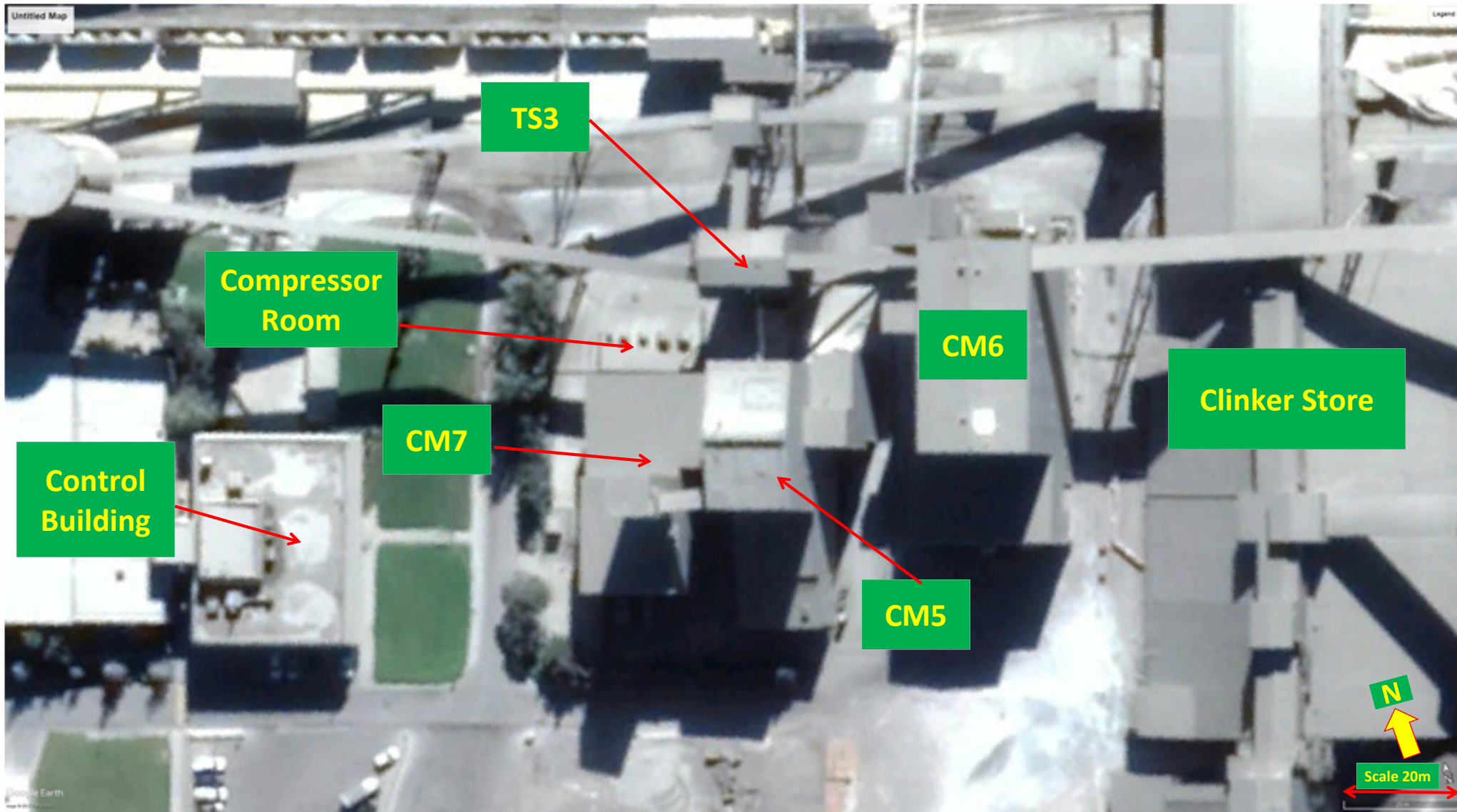


Figure 3.47: Boral Cement Berrima - Aerial view of layout of No.7 Cement Mill area

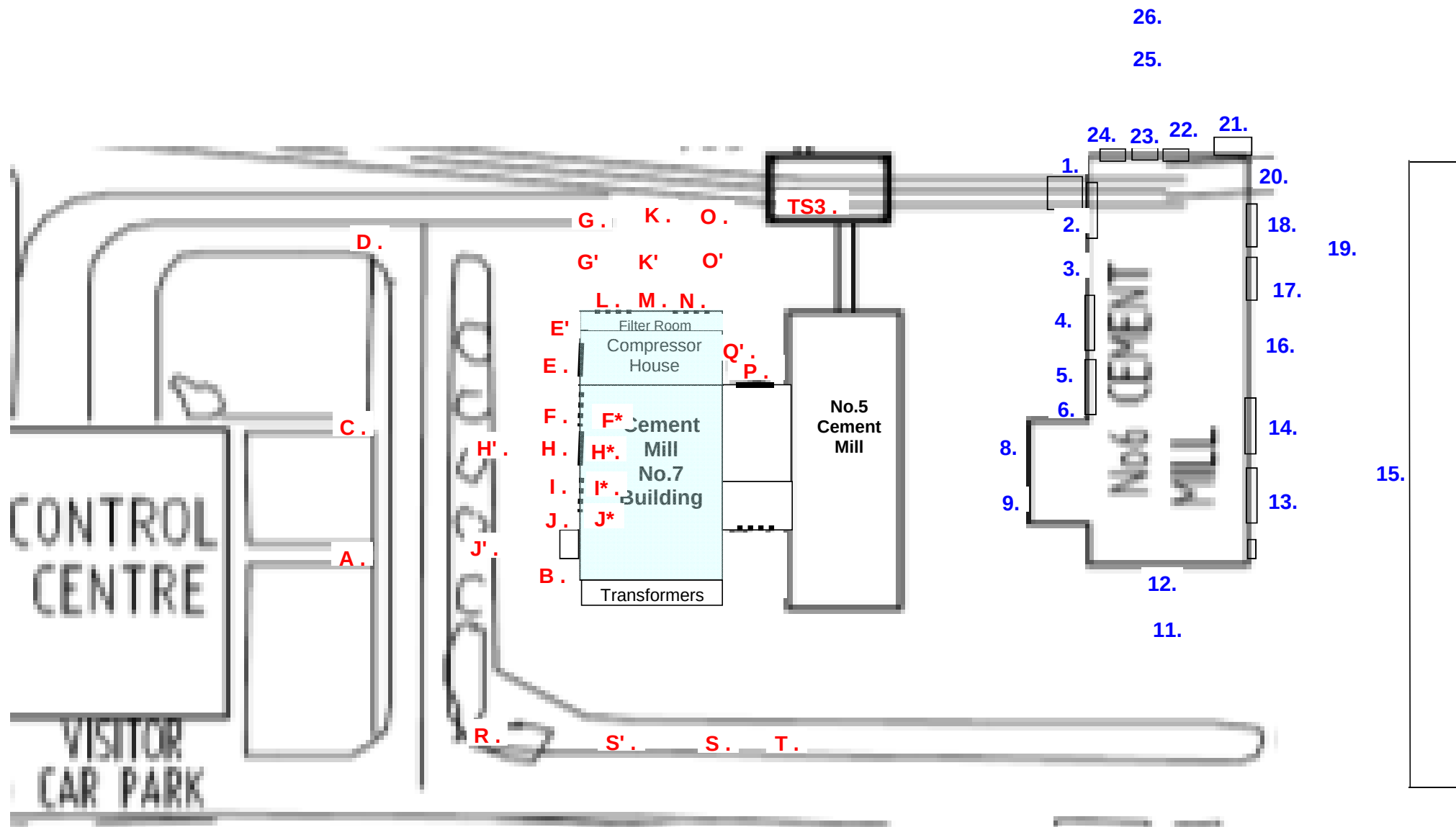


Figure 3.48: Boral Cement Berrima - Noise Assessment - Measurement locations for CM6 & CM7



Figure 3.49: Aerial view of No.7 Cement Mill, CM6 and sound level measurement locations

Table 3.5: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Cement Mill No.7 and CM6

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
CM7	A Top of stairs S	124	10/09/2019	2:13 PM	32	73	89	74	74	72	16	
	C Top of stairs N	635	2/10/2019	3:42 PM	30	72	82	74	73	71	11	2/10/2019 RM6 Off
	A Top of stairs S	636	2/10/2019	3:43 PM	30	73	84	75	74	72	11	2/10/2019 RM6 Off
	B 2m W of wall, edge of barrier facing baghouse	637	2/10/2019	3:44 PM	37	75	91	76	76	75	16	2/10/2019 RM6 Off
	B 2m W of wall, edge of barrier facing baghouse	134	10/09/2019	2:30 PM	33	79	93	80	80	78	14	2.8m from lource - panel vibrating
	B' 1m S of mill motor fan discharge, @ 1.7m above ground	638	2/10/2019	3:45 PM	30	77	92	79	78	77	14	2/10/2019 RM6 Off
	C Top of stairs N	125	10/09/2019	2:14 PM	34	72	83	74	73	72	11	
	D At corner N of Admin	126	10/09/2019	2:16 PM	53	74	83	76	75	73	10	27 m from building
	E Compressor room door @ 1m	128	10/09/2019	2:20 PM	34	70	85	72	71	70	15	
	E' Man door to compressor filter room@ 1m	127	10/09/2019	2:19 PM	32	69	84	70	70	69	15	
	F Wall vents N on W side @ 1m	129	10/09/2019	2:22 PM	31	75	87	76	76	75	12	
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7	142	10/09/2019	2:42 PM	33	74	83	76	75	73	9	16m from building
	I Vent S of door @ 1m	131	10/09/2019	2:24 PM	45	76	90	77	77	76	14	
	J Vents N of baghouse	133	10/09/2019	2:28 PM	50	78	96	80	79	78	18	
	J' Edge of concrete opp, J.	136	10/09/2019	2:33 PM	40	76	93	77	77	75	18	8.8m from building
	H W roller door @ 1m	632	2/10/2019	3:39 PM	44	81	88	85	85	80	7	2/10/2019 RM6 Off
	H W roller door @ 1m	130	10/09/2019	2:23 PM	31	79	91	80	79	79	12	
	H' Edge concrete opp door H	132	10/09/2019	2:25 PM	32	73	87	75	74	73	14	9m from building
	H' Edge concrete opp door H	633	2/10/2019	3:40 PM	36	74	84	76	75	74	10	2/10/2019 RM6 Off
	K Line level with G centre of compressor house	141	10/09/2019	2:41 PM	45	72	82	74	74	72	10	15.6m from building
	L N wall vent W side @ 1m	137	10/09/2019	2:36 PM	36	72	82	73	73	71	11	outside filter room
	M Between wall vents @ 1m to wall	138	10/09/2019	2:37 PM	31	71	81	73	73	70	11	3.76m outside filter room (obstacle in way)
	N Wall vents N wall E side @ 1m	139	10/09/2019	2:39 PM	32	71	82	72	72	70	11	outside filter room
	Bottom of stairs N	634	2/10/2019	3:41 PM	30	72	82	74	73	72	10	2/10/2019 RM6 Off
	O Line E side of Comp House 13.5m to control point	140	10/09/2019	2:40 PM	43	72	82	73	73	71	10	15m from building
	P 1m N roll door CM7	145	10/09/2019	2:48 PM	43	80	89	81	81	80	9	
	Under TS3 ground level 13.8 m from CM7	143	10/09/2019	2:45 PM	32	72	85	74	73	72	13	ground level 13.8 m from CM7
	Transfer Station #TS3 Level 1 N side opening	188	10/09/2019	4:57 PM	33	74	83	76	75	74	9	north side platform 2m above ground
	TS3 Platform opp fan discharge	189	10/09/2019	5:01 PM	37	74	84	75	75	74	9	Platform Level
	R corner SW of CM7	176	10/09/2019	3:40 PM	34	76	90	78	78	75	14	17m to building
	R corner SW of CM7	602	2/10/2019	3:08 PM	35	75	87	76	76	74	12	2/10/2019 RM6 Off
	S' Kerb Opp W wall CM7	175	10/09/2019	3:38 PM	39	75	89	76	75	74	14	15m to building 7.6 to fence
	S' Kerb Opp W wall CM7	603	2/10/2019	3:09 PM	31	74	87	76	75	73	13	2/10/2019 RM6 Off
	S Kerb opp W side CM7 tower	604	2/10/2019	3:10 PM	32	72	83	74	73	72	11	2/10/2019 RM6 Off
	S Kerb opp E side CM7 tower	174	10/09/2019	3:37 PM	32	75	89	77	76	75	13	
	S Kerb opp E side CM7 tower	605	2/10/2019	3:10 PM	30	72	83	74	73	72	10	2/10/2019 RM6 Off
	T Kerb Opp W wall CM5	173	10/09/2019	3:36 PM	41	76	86	76	76	75	11	10m to building
	T Kerb Opp W wall CM5	606	2/10/2019	3:11 PM	30	73	84	75	74	73	11	2/10/2019 RM6 Off

Table 3.5: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Cement Mill No.7 and CM6

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
CM7 Inside	H* Inside main W roll door @ 1m	435	10/09/2019	4:55 PM	33	95	99	95	95	94	5	
	F* Inside NW corner	436	10/09/2019	4:56 PM	52	92	97	93	92	91	5	
	I* W side by hydraulics bench	437	10/09/2019	4:57 PM	30	94	99	96	95	94	5	
	J* inside vents	438	10/09/2019	4:58 PM	35	92	98	93	92	91	6	
	J* SW corner by vents at baghouse	439	10/09/2019	4:59 PM	55	89	97	91	90	89	8	
	N end under centre axis, ground level	446	10/09/2019	5:06 PM	30	96	99	97	97	96	3	
	N end ground @ 2m	440	10/09/2019	5:00 PM	33	94	98	95	95	93	4	
	Centre axis N end @ 2m	441	10/09/2019	5:01 PM	45	98	102	99	99	97	4	
	Inside Door P N end of mill building @ 1m	442	10/09/2019	5:02 PM	55	94	98	95	94	93	4	
	Inside E side mill centre at columns N end	443	10/09/2019	5:03 PM	38	100	102	101	101	99	2	
	Inside E side mill centre at columns S end	444	10/09/2019	5:04 PM	31	98	101	99	98	97	4	
	Inside NW corner mill room	445	10/09/2019	5:05 PM	34	92	97	93	92	91	6	
	C701 platform	447	10/09/2019	5:07 PM	31	91	97	92	92	91	5	
	Platform above centre centre mill	448	10/09/2019	5:08 PM	30	92	97	93	92	92	6	
	Inside, above Mill drive gear S end	449	10/09/2019	5:10 PM	30	91	97	92	91	90	6	
	Tower stairs at roof level	450	10/09/2019	5:11 PM	31	89	95	90	90	89	6	
	1st platform above roof level in BE tower W side	451	10/09/2019	5:12 PM	31	86	94	87	86	85	8	
	2nd platform in BE tower by fans FA703 & FA720, W side wall @ 1m	452	10/09/2019	5:13 PM	30	82	91	83	83	82	9	
	Between Fans FA703 on & FA720 on	453	10/09/2019	5:13 PM	30	84	92	85	84	83	8	
	At crossway to CM5 level, N side at transfer to conveyor	454	10/09/2019	5:14 PM	31	82	91	83	82	81	9	
	At crossway to CM5 level, W side by wall @ 1m, BE @ 1.8m	455	10/09/2019	5:15 PM	30	82	90	83	82	81	8	
	At W end crossway to CM5 by vent in S wall	456	10/09/2019	5:16 PM	33	79	89	79	79	78	11	
	Top level BE tower W side NW corner	459	10/09/2019	5:18 PM	30	83	91	84	84	82	8	
	Top level BE tower S side BE @ 0.8m	460	10/09/2019	5:19 PM	33	82	91	84	83	81	9	
	Top level BE tower E side by drive motor end @ 0.8m	461	10/09/2019	5:20 PM	28	84	92	85	84	83	9	Squeaky bucket elevator noise
	Top level BE tower N side by drive motor end @ 0.8m	462	10/09/2019	5:21 PM	31	83	92	84	84	83	9	Squeaky bucket elevator noise
	Crossway to CM5 E end by opening in floor	457	10/09/2019	5:17 PM	26	76	90	78	77	76	14	
	Crossway to CM5 by centre S wall vent	458	10/09/2019	5:18 PM	19	77	89	77	77	76	13	
	Main baghouse SE corner top, 4m to E wall	464	10/09/2019	5:25 PM	32	83	95	84	84	83	12	
	Main baghouse NE corner top, 4m to E wall	465	10/09/2019	5:26 PM	32	84	92	86	85	84	8	
	Base of main baghouse SW corner	463	10/09/2019	5:23 PM	31	85	98	86	86	85	13	
	CM7 FA701 motor & casing NE side @ 1.5m	467	10/09/2019	5:28 PM	24	89	98	90	90	89	9	
	Compressor house inside W man door	468	10/09/2019	5:30 PM	30	95	94	96	96	95	-1	Purge 95
	Compressor house inside by centre purge filter	469	10/09/2019	5:31 PM	30	90	90	91	91	89	0	Purge 90 reduced
	Compressor house inside E man door	470	10/09/2019	5:32 PM	30	75	86	76	76	75	11	No purge
	Compressor house inside centre	471	10/09/2019	5:33 PM	30	76	88	79	79	75	11	no purge, 1 extra compressor on
	Compressor house inside W man door	472	10/09/2019	5:33 PM	30	75	86	77	76	75	11	No purge
	E Outside W roll door compressor house	473	10/09/2019	5:34 PM	30	70	84	71	71	70	14	no purge, other sources are the noise contribution
	SW side of mill motor fan @ 2m to casing inlet & discharge ducts	466	10/09/2019	5:27 PM	30	86	96	87	87	85	10	

Table 3.5: Boral Cement Berrima - 2019 Annual Noise Assessment: Site Sound Levels Cement Mill No.7 and CM6

Area	Location	File No	Date	Start Time	Period sec.	Statistical Sound Level - dBA						Comments
						L _{Aeq}	L _{Ceq}	L _{Amax}	L _{A01}	L _{A90}	L _{Ceq} -L _{Aeq}	
CM6	1 North West Corner @ 1m	146	10/09/2019	2:50 PM	34	79	95	80	80	79	16	10/09/2019
	2 Front of Roller Door @ 1m	626	2/10/2019	3:33 PM	35	87	94	89	88	87	7	2/10/2019 RM6 Off
	2 Front of Roller Door @ 1m	147	10/09/2019	2:51 PM	37	80	92	81	81	80	11	Door open
	3 Between Door @ 1m	627	2/10/2019	3:34 PM	23	80	90	81	81	80	10	2/10/2019 RM6 Off
	3 Between Door @ 1m	148	10/09/2019	2:53 PM	34	79	89	80	80	78	11	
	4 Front of Roller Door @ 1m	149	10/09/2019	2:54 PM	31	81	91	82	82	81	9	
	4 Front of Roller Door @ 1m	628	2/10/2019	3:35 PM	32	81	91	82	82	81	9	2/10/2019 RM6 Off
	5 Front of Southern Roller Door @ 1m	150	10/09/2019	2:55 PM	48	80	89	81	81	80	10	
	5 Front of Southern Roller Door @ 1m	629	2/10/2019	3:35 PM	30	81	90	82	82	81	9	2/10/2019 RM6 Off
	6 Northern face of western ext. @ 1m	151	10/09/2019	2:57 PM	33	78	89	79	79	77	11	1m from both walls
	7 On CM5 Platform (N) @ 6.8m	155	10/09/2019	3:03 PM	31	77	87	78	78	77	9	6.9m from CM6
	8 Western face (N) of western ext. @ 1m	152	10/09/2019	2:58 PM	31	76	90	77	77	76	14	
	9 Western face(S) of western ext. @ 1m	153	10/09/2019	3:00 PM	33	76	89	77	77	76	13	
	10 On CM5 Platform (S) @ 6.8m	154	10/09/2019	3:01 PM	45	77	87	78	78	76	11	6.8m from CM6
	10 On CM5 Platform (S) @ 6.8m	607	2/10/2019	3:14 PM	37	75	86	76	76	75	11	E side of CM5, levelwith S of CM6 - 2/10/2019 RM6 Off
	11 14.5m from S wall at joint	608	2/10/2019	3:15 PM	39	78	84	80	80	76	6	2/10/2019 RM6 Off
	11 14.5m from S wall at joint	157	10/09/2019	3:06 PM	32	76	85	77	77	75	9	14.4m from building
	12 6m from S wall CM6 at joint	156	10/09/2019	3:05 PM	51	80	86	82	82	80	6	2.9m from building - under exhaust
	12 6m from S wall CM6 at joint	609	2/10/2019	3:16 PM	31	79	85	81	81	78	6	2/10/2019 RM6 Off
	13 E side S roll door @ 1m	158	10/09/2019	3:08 PM	40	77	85	78	78	76	8	315 Hz tonal 73.5
	13 E side S roll door @ 1m	610	2/10/2019	3:17 PM	31	77	85	79	78	77	8	2/10/2019 RM6 Off
	14 CM6 E side centre door @ 1m	159	10/09/2019	3:11 PM	32	79	87	80	80	78	9	Door open 200mm from Bottom no tonal
	14 CM6 E side centre door @ 1m	611	2/10/2019	3:18 PM	39	84	91	86	86	84	7	Door open 1m - 2/10/2019 RM6 Off
	15 2m from Clinker Building opp 13 & 14	172	10/09/2019	3:33 PM	42	75	83	76	75	74	8	approx 10m fro CM6
	15 2m from Clinker Building opp 13 & 14	612	2/10/2019	3:19 PM	33	77	85	78	77	76	8	2/10/2019 RM6 Off
	16 E wall centre @ 2m	160	10/09/2019	3:12 PM	32	75	83	75	75	74	8	
	16 E wall centre @ 2m	613	2/10/2019	3:20 PM	33	76	84	77	77	75	8	2/10/2019 RM6 Off
	17 E roll door opp Mill	614	2/10/2019	3:21 PM	39	82	87	83	83	81	5	2/10/2019 RM6 Off
	17 E roll door opp Mill	161	10/09/2019	3:13 PM	32	83	88	84	84	83	5	
	18 Door opp Comp Room @ 1m	615	2/10/2019	3:22 PM	30	81	85	82	82	80	4	Door open bottom 100mm - 2/10/2019 RM6 Off
	18 Door opp Comp Room @ 1m	162	10/09/2019	3:14 PM	72	79	84	82	82	75	5	Door ajar 100mm frequency increasing low to high
	19 Clinker Building @ 2m opp 18	171	10/09/2019	3:31 PM	33	75	83	77	76	75	7	10.2m fro CM6
	19 Clinker Building @ 2m opp 18	616	2/10/2019	3:23 PM	30	74	82	77	76	74	8	2/10/2019 RM6 Off
	20 Inside Filter Room @0.3m	164	10/09/2019	3:18 PM	32	75	86	77	77	75	10	300mm from vent
	20 Man door - open 100mm	163	10/09/2019	3:17 PM	32	74	82	76	75	74	8	1.5m from door- stuck adjar
	20 Man door - open 100mm	617	2/10/2019	3:23 PM	31	75	83	76	76	74	8	Small roller door on Compressor room open 0.5m - 2/10/2019 RM6 Off
	21 1m Outside vent fan filter louvre	165	10/09/2019	3:20 PM	35	74	84	75	75	74	10	
	21 1m Outside vent fan filter louvre	618	2/10/2019	3:24 PM	41	74	85	75	75	73	11	Inside the panel - 2/10/2019 RM6 Off
	22 E side N wall vent @ 1m	619	2/10/2019	3:25 PM	30	81	89	82	82	80	8	2/10/2019 RM6 Off
	22 E side N wall vent @ 1m	166	10/09/2019	3:21 PM	42	81	89	82	82	81	8	
	23 Centre N wall vent @ 1m	620	2/10/2019	3:26 PM	30	84	90	85	85	84	6	2/10/2019 RM6 Off
	23 Centre N wall vent @ 1m	167	10/09/2019	3:22 PM	41	84	90	85	85	84	6	
	24 W side N wall vent @ 1m	621	2/10/2019	3:27 PM	31	81	88	82	81	80	7	2/10/2019 RM6 Off
	24 W side N wall vent @ 1m	168	10/09/2019	3:23 PM	36	80	89	82	81	80	8	
	25 11m N of CM6 at joint	622	2/10/2019	3:28 PM	35	75	84	76	75	74	10	2/10/2019 RM6 Off
	25 11m N of CM6 at joint	169	10/09/2019	3:25 PM	67	74	84	75	74	73	10	13.6m out; door above vent open; wav 53
	26 22.6m N of CM6	623	2/10/2019	3:29 PM	31	71	85	74	72	71	13	Also under conveyor - 2/10/2019 RM6 Off
	26 22.6m N of CM6	170	10/09/2019	3:29 PM	46	71	84	72	72	71	13	22m out; door above vent open;
	27 4m N of Conveyor transfer out of Clinker Building	624	2/10/2019	3:30 PM	30	77	89	83	81	76	12	2/10/2019 RM6 Off
	28 4m N of dust collector on next building W , conveyor transfer noise	625	2/10/2019	3:31 PM	49	77	87	81	80	77	9	2/10/2019 RM6 Off
	Door platform near CM6 W wall fan @ 7m	190	10/09/2019	5:03 PM	32	85	99	87	86	84	15	Platform along conveyor
	Door platform near CM6 W wall fan @ 3.5m	191	10/09/2019	5:05 PM	34	92	105	93	92	91	13	Platform facing exhaust fan 1.78 out to fan 3.5 inside to fan

Table 3.6: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for CM7 & CM6

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
CM7	A Top of stairs S	124	33	49	49	43	49	51	53	56	60	56	57	61	65	64	63	62	62	62	60	58	56	53	49	45	41	36	30	23
	C Top of stairs N	635	30	35	40	43	49	49	51	53	57	57	58	59	63	66	62	61	61	59	58	56	54	52	48	42	36	28	19	12
	A Top of stairs S	636	33	36	46	43	49	50	51	55	59	57	59	62	65	65	62	63	63	60	59	57	56	52	49	44	37	31	24	17
	B 2m W of wall, edge of barrier facing baghouse	637	38	44	55	49	53	54	54	57	64	61	61	67	65	63	63	63	68	63	60	58	56	54	51	48	44	37	32	26
	B 2m W of wall, edge of barrier facing baghouse	637	44	52	51	51	48	49	59	65	70	66	65	69	67	67	67	67	67	66	69	67	63	62	59	57	54	50	47	41
	B' 1m S of mill motor fan discharge, @ 1.7m above ground	638	36	45	56	47	52	52	54	57	63	63	66	73	68	68	66	64	64	62	61	58	56	53	49	44	38	32	26	19
	C Top of stairs N	125	31	39	39	44	49	49	51	55	59	56	56	61	65	64	63	62	61	61	59	57	55	53	48	42	37	34	24	19
	D At corner N of Admin	126	33	41	40	42	47	47	49	52	54	54	59	61	62	69	64	64	64	61	59	56	55	53	49	43	38	33	23	20
	E Compressor room door @ 1m	128	31	45	44	42	46	48	50	56	59	56	56	58	60	61	62	61	60	58	56	53	50	47	43	39	39	39	30	23
	E' Man door to compressor filter room@ 1m	127	34	43	43	43	45	49	51	53	57	56	56	58	59	61	60	59	60	57	55	52	49	47	44	37	31	25	21	19
	F Wall vents N on W side @ 1m		35	45	43	44	49	53	55	59	64	63	63	63	66	67	67	65	64	61	61	60	57	53	50	44	36	28	22	19
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7		34	36	38	43	46	48	50	53	56	57	59	59	66	68	65	62	63	61	60	59	56	54	51	45	38	31	23	21
	I Vent S of door @ 1m		34	50	50	47	51	53	58	60	63	63	64	64	68	68	67	65	64	62	62	61	58	54	51	45	39	33	28	22
	J Vents N of baghouse		38	58	56	53	58	58	56	62	70	66	65	71	69	67	69	67	66	62	64	59	56	53	50	45	41	36	30	24
	J' Edge of concrete opp, J.		36	54	54	44	49	52	54	56	61	58	59	65	64	64	65	66	67	67	65	63	62	59	57	54	51	49	44	38
	H W roller door @ 1m	632	34	38	44	46	51	54	58	62	67	66	65	68	69	71	72	73	73	70	69	68	68	66	60	54	48	42	35	28
	H W roller door @ 1m	632	35	51	49	46	51	54	57	61	67	64	64	66	69	70	69	68	67	68	67	66	65	63	60	53	46	41	32	23
	H' Edge concrete opp door H	633	30	34	42	44	51	54	54	56	60	59	58	63	63	64	65	65	64	63	63	61	59	57	54	49	43	35	25	17
	H' Edge concrete opp door H	633	33	47	47	44	48	51	53	55	61	58	58	62	63	63	65	65	63	62	62	59	58	56	54	49	43	34	27	23
	K Line level with G centre of compressor house		28	36	39	43	45	47	49	53	58	58	59	57	63	64	65	62	61	60	58	57	55	52	51	44	38	30	22	20
	L N wall vent W side @ 1m		34	37	37	43	43	46	49	56	57	56	59	60	62	66	62	61	61	58	56	53	50	48	45	40	35	30	21	18
	M Between wall vents @ 1m to wall		32	34	38	43	42	46	48	54	57	55	56	57	61	65	63	60	59	57	56	53	51	48	44	39	33	26	20	18
	N Wall vents N wall E side @ 1m		33	34	36	41	45	48	50	55	57	57	61	60	60	62	62	60	60	58	57	53	51	49	45	40	34	27	21	18
	Bottom of stairs N	634	32	35	41	43	48	48	49	53	58	57	58	59	62	67	61	63	61	60	59	57	55	53	49	43	38	35	28	18
	O Line E side of Comp House 13.5m to control point		31	34	38	42	43	47	49	54	58	59	62	60	62	63	63	61	61	60	58	56	55	52	49	43	38	34	27	24
	P 1m N roll door CM7		41	42	44	47	48	54	59	61	65	65	66	67	71	72	71	71	70	68	67	65	64	62	57	52	45	38	30	24
	Under TS3 ground level 13.8 m from CM7		42	36	41	45	46	49	49	53	55	56	56	59	62	64	65	63	62	62	60	58	55	52	49	43	40	36	32	23
	Transfer Station #TS3 Level 1 N side opening	188	36	35	39	47	45	49	49	52	53	56	57	60	63	66	66	65	64	65	61	59	57	56	52	49	46	42	37	31
	TS3 Platform opp fan discharge	189	35	36	39	44	45	48	52	57	59	58	60	62	66	66	66	65	63	63	61	59	58	56	51	47	42	37	33	26
	R corner SW of CM7	602	33	44	47	44	54	51	53	55	61	60	59	68	68	66	63	63	63	61	60	58	57	54	50	45	39	33	27	22
	R corner SW of CM7	602	34	50	50	45	50	50	52	55	61	56	60	69	69	66	64	65	65	64	62	61	59	56	53	49	44	39	33	29
	S' Kerb Opp W wall CM7	603	34	49	48	43	49	50	52	55	64	58	59	64	64	65	66	65	65	63	63	61	58	55	51	46	40	33	26	20
	S' Kerb Opp W wall CM7	603	32	44	49	43	51	50	53	55	61	61	60	64	65	66	63	63	63	62	61	58	57	54	51	46	41	36	30	24
	S Kerb opp W side CM7 tower	604	35	36	40	42	50	50	52	54	59	59	60	64	61	62	62	63	62	61	60	58	56	54	50	46	40	33	24	15
	S Kerb opp E side CM7 tower	605	34	49	47	43	49	50	52	56	62	59	62	67	65	65	66	65	65	64	63	61	58	56	52	47	40	32	24	21
	S Kerb opp E side CM7 tower	605	33	35	39	41	48	49	51	55	60	59	59	63	62	61	64	62	62	61	61	58	56	53	49	44	38	29	19	11
	T Kerb Opp W wall CM5	606	32	46	44	43	47	50	54	58	62	59	61	65	64	64	67	66	67	65	65	63	60	57	53	47	42	37	30	22
	T Kerb Opp W wall CM5	606	33	36	40	43	49	50	52	56	60	58	60	65	62	62	63	64	65	62	61	60	57	53	49	43	36	28	19	13

Table 3.6: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for CM7 & CM6

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																												
			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	
CM7 Inside	H* Inside main W roll door @ 1m	435	38	50	49	54	57	60	64	69	76	79	78	82	85	86	86	85	84	83	83	82	82	81	79	74	69	63	56	48	
	F* Inside NW corner	436	41	50	49	52	52	56	63	67	73	76	77	78	79	83	83	83	82	82	80	79	78	76	72	67	61	54	46	37	
	I* W side by hydraulics bench	437	38	46	49	52	56	63	69	71	76	78	78	83	84	88	85	83	84	81	81	80	82	78	78	72	66	59	52	44	
	J* inside vents	438	40	53	52	54	57	60	65	69	75	75	76	81	81	84	83	81	82	79	80	78	78	75	72	67	61	54	47	39	
	J* SW corner by vents at baghouse	439	40	55	51	51	53	59	63	68	75	74	74	82	79	80	80	79	78	77	77	75	74	71	68	63	58	50	44	37	
	N end under centre axis, groundlevel	446	34	42	42	46	54	63	69	72	76	78	80	79	81	87	86	87	88	87	86	86	84	82	79	73	69	63	56	48	
	N end ground @ 2m	440	38	45	42	48	53	63	66	70	74	76	77	79	81	84	85	85	85	85	83	82	81	78	75	70	64	57	50	41	
	Centre axis N end @ 2m	441	39	53	49	50	55	63	70	74	80	79	83	84	85	87	88	89	89	89	87	87	86	83	80	75	70	64	56	47	
	Inside Door P N end of mill building @ 1m	442	34	45	45	52	55	64	64	68	74	76	77	80	82	84	85	85	84	83	82	82	81	79	76	71	65	59	51	43	
	Inside E side mill centre at columns N end	443	35	46	48	52	58	64	68	71	76	78	80	85	87	87	88	89	89	90	90	91	90	89	86	81	76	71	63	56	
	Inside E side mill centre at columns S end	444	37	48	48	52	59	65	68	72	75	77	80	84	88	90	89	88	87	87	86	85	85	83	81	77	72	68	62	55	
	Inside NW corner mill room	445	41	54	50	52	51	57	62	67	74	77	77	78	79	83	83	83	82	81	80	79	78	76	72	67	62	56	47	38	
	C701 platform	447	36	48	46	48	54	60	65	70	76	76	77	77	78	82	82	83	81	81	80	80	79	76	73	68	62	56	50	42	
	Platform above centre centre mill	448	36	44	44	49	57	64	67	71	75	77	79	80	80	82	82	82	81	81	81	80	80	78	75	70	64	58	52	43	
	Inside, above Mill drive gear S end	449	34	49	48	50	56	62	66	70	75	76	77	82	80	80	81	80	82	79	79	77	76	73	70	66	60	54	48	40	
	Tower stairs at roof level	450	40	52	48	50	54	58	64	66	72	74	76	77	77	80	80	80	80	79	79	78	76	73	70	65	59	52	45	36	
	1st platform above roof level in BE tower W side	451	37	50	46	49	54	57	61	66	72	73	73	76	75	76	77	75	75	73	73	71	70	67	64	60	56	50	44	40	
	2nd platform in BE tower by fans FA703 & FA720, W side wall @ 1m	452	40	48	46	48	51	56	59	63	69	70	70	72	74	73	73	72	71	70	70	68	67	65	62	61	56	53	46	41	
	Between Fans FA703 on & FA720 on	453	35	50	47	48	51	59	62	64	67	70	71	72	74	74	74	73	73	73	73	71	70	67	65	64	62	61	57	52	
	At crossway to CM5 level, N side at transfer to conveyor	454	38	40	42	47	53	60	61	64	68	68	69	71	72	71	72	72	70	70	69	67	67	65	62	63	58	53	45	38	
	At crossway to CM5 level, W side by wall @ 1m, BE @ 1.8m	455	39	43	41	48	51	57	60	63	67	68	69	71	72	72	72	72	71	70	70	68	67	66	63	63	58	55	46	39	
	At W end crossway to CM5 by vent in S wall	456	37	39	42	49	52	57	61	62	66	65	67	69	68	68	68	68	68	67	66	64	63	62	58	58	53	48	39	33	
	Top level BE tower W side NW corner	459	39	45	44	47	50	54	60	63	68	68	68	69	77	71	71	71	71	71	70	69	70	69	67	69	65	61	53	44	
	Top level BE tower S side BE @ 0.8m	460	41	44	45	50	53	60	62	62	63	68	67	69	72	70	71	71	69	70	69	69	69	69	70	72	67	64	55	50	
	Top level BE tower E side by drive motor end @ 0.8m	461	40	49	46	50	51	61	65	63	64	68	69	72	74	71	72	74	73	74	72	71	71	70	66	68	63	60	52	44	
	Top level BE tower N side by drive motor end @ 0.8m	462	41	52	47	46	51	57	60	62	66	69	68	70	74	72	72	76	73	74	71	70	70	69	66	67	63	59	51	43	
	Crossway to CM5 E end by opening in floor	457	36	42	43	52	57	58	60	63	66	68	68	66	67	65	63	62	61	61	60	58	57	56	55	54	49	45	42	37	
	Crossway to CM5 by centre S wall vent	458	40	41	44	49	52	56	59	59	64	63	64	65	66	67	67	66	66	65	64	62	61	59	56	55	50	46	38	33	
	Main baghouse SE corner top, 4m to E wall	464	37	55	53	49	53	59	59	65	70	72	72	73	72	73	73	73	73	71	72	69	67	64	61	58	53	48	45	39	
	Main baghouse NE corner top, 4m to E wall	465	37	45	44	46	54	58	61	65	70	73	74	75	73	75	74	74	74	72	73	69	68	65	61	57	53	46	41	35	
	Base of main baghouse SW corner	463	39	59	57	49	54	56	60	64	72	73	73	76	76	76	75	74	74	73	73	70	68	65	63	63	59	51	47	41	
	CM7 FA701 motor & casing NE side @ 1.5m	467	39	53	51	57	65	67	68	68	75	73	73	79	78	78	79	79	79	78	79	74	73	70	70	75	72	64	62	57	
	Compressor house inside W man door	468	39	39	40	43	42	47	57	65	63	64	64	67	71	70	71	74	76	78	79	81	85	85	88	89	87	84	79	73	
	Compressor house inside by centre purge filter	469	37	34	38	43	46	52	58	62	64	61	61	63	67	66	65	68	70	72	73	75	81	79	83	83	83	78	72	66	
	Compressor house inside E man door	470	37	37	37	44	45	52	58	60	63	63	62	62	65	64	63	65	65	64	63	62	60	57	54	50	45	42	40	34	
	Compressor house inside centre	471	37	34	38	44	46	52	59	68	64	63	65	64	68	64	64	64	65	65	64	63	62	60	57	55	53	51	50	48	44
	Compressor house inside W man door	472	34	37	38	43	47	50	58	65	62	62	64	63	64	64	64	64	65	65	64	63	61	60	59	56	55	54	51	46	40
	E Outside W roll door compressor house	473	30	45	41	43	46	49	51	54	58	57	56	59	61	61	61	61	61	59	56	53	50	47	44	39	34	29	24	19	
	SW side of mill motor fan @ 2m to casing inlet & discharge ducts	466	41	55	51	52	61	61	61	67	71	72	72	77	76	75	75	75	75	74	75	72	70	67	65	66	63	55	51	45	

Table 3.6: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for CM7 & CM6

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
CM6	1 North West Corner @ 1m		52	45	50	57	51	54	55	60	64	65	65	67	69	69	70	70	69	69	67	66	63	60	55	51	45	39	31	25
	2 Front of Roller Door @ 1m	626	49	41	44	53	54	58	61	66	67	68	72	76	77	76	77	76	76	77	77	77	76	73	69	65	60	54	49	42
	2 Front of Roller Door @ 1m	626	47	41	48	55	53	54	57	60	65	66	68	69	69	71	72	71	71	70	68	66	64	61	57	52	47	40	33	27
	3 Between Door @ 1m	627	41	43	49	52	49	52	55	59	63	63	66	68	70	69	70	70	68	68	66	64	61	59	55	50	45	38	31	24
	3 Between Door @ 1m	627	42	43	48	52	50	52	54	60	64	64	68	69	69	70	71	71	70	69	68	67	66	63	59	54	49	43	37	31
	4 Front of Roller Door @ 1m	628	42	41	47	53	52	54	57	61	66	67	69	71	73	72	73	71	70	69	68	66	65	63	59	55	48	42	35	28
	4 Front of Roller Door @ 1m	628	43	42	47	53	52	55	57	61	66	67	68	71	73	72	73	72	70	69	68	66	65	62	58	53	47	41	33	26
	5 Front of Southern Roller Door @ 1m	629	39	40	45	52	54	55	57	61	65	65	69	70	70	71	71	70	69	68	67	65	62	59	55	51	46	39	33	26
	5 Front of Southern Roller Door @ 1m	629	41	40	46	52	52	54	57	61	66	67	69	70	71	72	72	71	70	68	66	64	61	56	52	48	42	35	27	19
	6 Northern face of western ext. @ 1m		39	41	46	53	47	47	52	60	64	66	64	67	68	69	69	67	66	66	65	63	59	56	52	47	41	35	27	19
	7 On CM5 Platform (N) @ 6.8m		38	38	42	50	49	52	55	58	62	62	62	65	66	67	69	68	68	68	66	63	60	58	55	48	41	34	27	22
	8 Western face (N) of western ext. @ 1m		46	41	48	49	52	54	54	56	60	62	63	64	67	67	68	67	67	66	65	63	59	56	51	45	39	32	25	19
	9 Western face(S) of western ext. @ 1m		45	42	43	50	51	50	53	56	60	60	62	63	64	66	68	68	67	66	65	62	59	56	52	46	39	31	24	18
	10 On CM5 Platform (S) @ 6.8m	607	40	38	41	48	49	51	54	56	60	59	60	64	63	64	66	66	67	65	64	61	59	55	52	46	39	30	21	14
	10 On CM5 Platform (S) @ 6.8m	607	41	36	44	51	49	53	55	58	61	60	61	64	65	67	68	68	69	67	66	63	60	57	53	47	41	34	27	19
	11 14.5m from S wall at joint	608	29	35	38	48	50	52	54	58	61	58	61	63	62	64	66	69	68	65	64	62	61	58	54	48	41	34	27	23
	11 14.5m from S wall at joint	608	29	33	38	44	48	51	53	58	60	59	62	64	62	63	66	72	73	65	64	62	62	58	56	52	42	35	26	18
	12 6m from S wall CM6 at joint	609	31	33	36	45	54	53	53	57	62	60	61	65	63	64	67	74	76	68	66	65	66	62	61	55	47	40	31	25
	12 6m from S wall CM6 at joint	609	30	34	39	43	51	50	53	59	61	59	61	68	63	63	66	70	75	69	67	67	67	62	62	57	47	40	31	23
	13 E side S roll door @ 1m	610	30	33	38	43	45	48	52	55	59	61	63	74	63	62	64	67	65	64	63	61	59	56	51	45	39	32	25	18
	13 E side S roll door @ 1m	610	32	34	38	44	50	50	54	57	61	64	64	71	66	64	66	67	68	65	64	62	64	60	54	47	42	37	29	20
	14 CM6 E side centre door @ 1m	611	33	35	39	45	48	53	57	62	65	67	69	70	70	69	69	68	66	65	65	63	62	60	56	52	47	42	36	29
	14 CM6 E side centre door @ 1m	611	35	36	41	46	52	57	62	65	69	71	71	74	76	74	74	75	73	72	72	71	69	68	67	66	64	61	57	51
	15 2m from Clinker Building opp 13 & 14	612	28	34	39	42	45	49	50	56	59	60	61	62	63	64	65	66	65	66	63	61	59	56	52	47	41	35	30	23
	15 2m from Clinker Building opp 13 & 14	612	30	31	39	43	47	51	55	57	61	65	65	68	67	65	66	65	67	66	64	62	61	58	55	52	49	46	42	35
	16 E wall centre @ 2m	613	29	32	37	43	44	49	52	56	60	61	64	64	65	65	65	64	64	64	62	60	58	55	51	47	43	39	34	27
	16 E wall centre @ 2m	613	32	32	37	42	45	50	54	57	61	64	65	67	66	67	66	64	64	64	63	61	60	58	56	55	55	52	50	42
	17 E roll door opp Mill	614	31	33	39	46	48	52	55	60	63	64	68	70	74	73	72	72	73	75	74	70	68	68	63	59	56	52	45	37
	17 E roll door opp Mill	614	32	34	40	46	48	51	55	60	62	65	66	71	73	72	71	70	71	74	72	69	67	67	61	58	55	51	45	36
	18 Door opp Comp Room @ 1m	615	30	31	37	42	45	48	51	57	61	60	62	64	65	66	67	67	68	71	69	72	68	66	63	59	54	51	47	44
	18 Door opp Comp Room @ 1m	615	31	32	39	45	46	48	52	58	61	61	62	65	66	70	68	66	70	76	67	71	72	64	62	61	55	49	44	38
	19 Clinker Building @ 2m opp 18	616	33	32	36	42	43	48	51	56	59	59	62	64	63	62	65	66	67	66	63	63	61	59	55	51	46	39	33	26
	19 Clinker Building @ 2m opp 18	616	29	32	38	45	44	48	52	55	58	61	61	64	64	65	63	63	65	65	64	61	61	57	55	51	48	44	37	31
	20' Inside Filter Room @0.3m		35	38	38	45	42	49	56	62	62	63	63	65	63	64	65	65	66	63	62	62	61	59	56	54	51	47	41	35
	20 Man door - open 100mm	617	31	32	36	40	43	48	51	55	59	60	62	62	61	63	67	63	63	65	61	62	61	58						

Table 3.6A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for CM7 & CM6

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
CM7	A Top of stairs S	124	8	3	6	2	0	1	1	4	3	2	0	2	0	0	0	0	1	0	0	1	0	0	0	0	1	0
	C Top of stairs N	635	0	1	2	4	1	0	0	2	1	0	2	1	3	2	0	0	0	0	0	1	1	1	0	1	0	1
	A Top of stairs S	636	4	7	5	3	0	1	0	3	2	1	0	2	2	2	0	2	1	1	0	1	0	1	1	0	0	0
	B 2m W of wall, edge of barrier facing baghouse	637	2	8	5	1	0	1	2	5	2	3	4	0	1	0	2	5	1	0	0	1	0	1	0	2	1	1
	B 2m W of wall, edge of barrier facing baghouse	637	5	1	2	2	5	1	1	5	2	3	3	1	0	0	0	0	2	3	0	1	1	0	0	1	1	2
	B' 1m S of of mill motor fan discharge, @ 1.7m above ground	638	2	11	7	2	1	1	2	4	2	2	6	3	1	1	1	1	1	1	0	0	1	0	0	0	0	0
	C Top of stairs N	125	4	3	0	2	1	1	0	4	2	2	0	3	0	1	0	0	1	0	0	0	1	1	1	1	3	2
	D At corner N of Admin	126	4	1	2	3	1	0	0	1	2	1	1	3	6	2	0	2	1	0	0	0	1	1	1	0	2	3
	E Compressor room door @ 1m	128	8	0	2	1	0	2	1	3	1	1	0	1	0	1	0	0	0	1	0	0	1	0	2	0	5	1
	E' Man door to compressor filter room@ 1m	127	4	0	1	0	1	0	1	3	1	1	0	1	2	0	1	2	0	0	0	0	1	2	0	0	1	1
	F Wall vents N on W side @ 1m		6	1	2	0	1	1	1	3	1	0	1	1	0	1	0	1	1	0	1	0	0	2	1	0	2	1
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7		0	2	1	0	1	1	1	1	1	1	4	3	2	0	1	1	0	0	1	0	0	2	0	1	0	3
	I Vent S of door @ 1m		8	2	4	1	2	1	0	2	1	1	2	2	1	1	0	1	1	1	1	0	1	2	0	0	0	0
	J Vents N of baghouse		11	0	3	2	1	3	1	6	2	4	4	0	1	2	1	2	3	3	1	0	0	1	0	0	1	0
	J' Edge of concrete opp, J.		9	5	8	1	1	1	1	4	2	3	3	0	0	1	1	0	1	0	1	1	0	0	0	0	1	1
	H W roller door @ 1m	632	0	2	2	1	0	0	1	4	0	2	1	0	1	1	1	2	1	0	0	1	2	0	0	0	0	0
	H W roller door @ 1m	632	9	1	4	1	0	0	1	4	1	1	1	1	1	0	1	1	1	0	0	0	1	2	0	1	2	0
	H' Edge concrete opp door H	633	2	3	3	2	2	1	1	3	0	2	2	0	0	0	1	0	1	1	0	0	1	1	1	1	1	1
	H' Edge concrete opp door H	633	7	2	4	1	1	0	2	4	1	2	1	1	1	1	1	0	1	1	0	0	1	1	0	1	1	2
	K Line level with G centre of compressor house		2	0	1	0	0	1	0	2	0	2	4	2	0	2	1	0	0	0	0	0	0	2	0	1	0	3
	L N wall vent W side @ 1m		2	3	3	1	0	2	3	1	2	1	0	2	5	1	1	2	0	0	0	0	1	1	0	0	2	3
	M Between wall vents @ 1m to wall		1	0	3	2	1	2	1	2	1	0	1	0	3	0	1	1	0	0	0	0	1	1	0	1	0	2
	N Wall vents N wall E side @ 1m		1	2	1	1	0	2	1	1	2	2	1	1	1	1	1	0	0	1	1	0	1	0	0	1	0	2
	Bottom of stairs N	634	1	2	2	3	1	1	1	3	1	0	1	1	5	4	2	0	0	0	0	1	1	1	0	2	2	1
	O Line E side of Comp House 13.5m to control point		1	0	2	1	1	2	1	1	0	3	2	1	1	1	1	1	0	0	0	1	0	2	0	0	1	2
	P 1m N roll door CM7		0	1	1	3	1	1	1	2	0	0	2	2	1	0	0	0	0	0	0	1	1	1	1	0	1	1
	Under TS3 ground level 13.8 m from CM7		6	0	2	1	2	2	1	1	0	1	0	1	0	2	1	0	1	0	1	0	1	1	1	1	1	3
	Transfer Station #TS3 Level 1 N side opening	188	2	2	5	3	2	2	1	1	1	1	0	0	2	1	0	1	2	1	0	1	1	1	0	1	1	1
	TS3 Platform opp fan discharge	189	1	1	2	1	1	0	2	1	1	0	1	2	0	0	0	1	1	0	1	0	2	0	0	0	1	2
	R corner SW of CM7	602	4	3	6	6	2	0	2	3	0	5	4	1	1	2	0	1	0	0	0	0	1	1	0	0	0	0
	R corner SW of CM7	602	8	3	5	3	1	0	2	5	4	3	5	1	0	2	1	1	1	0	0	0	0	1	0	1	0	0
	S' Kerb Opp W wall CM7	603	8	2	6	3	1	0	3	7	3	2	2	1	1	0	0	0	0	1	0	0	1	0	1	0	0	1
	S' Kerb Opp W wall CM7	603	3	6	7	4	2	1	2	3	0	2	2	0	2	2	0	0	1	0	0	0	1	0	0	0	1	0
	S Kerb opp W side CM7 tower	604	1	1	3	4	1	0	1	2	0	2	3	2	0	0	1	0	0	1	0	0	1	0	1	1	1	0
	S Kerb opp E side CM7 tower	605	9	1	5	2	0	1	1	5	3	1	4	1	1	1	1	1	0	1	0	0	0	1	0	1	0	2
	S Kerb opp E side CM7 tower	605	1	1	2	2	0	1	0	4	1	2	3	1	1	2	1	1	0	1	0	0	1	0	1	1	1	1
	T Kerb Opp W wall CM5	606	8	1	2	1	1	0	0	4	3	1	2	0	1	1	1	2	1	1	0	0	0	1	0	0	1	1
	T Kerb Opp W wall CM5	606	0	0	1	2	1	1	0	3	2	1	3	1	1	0	0	2	1	0	1	0	1	1	1	1	0	2

Table 3.6A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for CM7 & CM6

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
CM7 Inside	H* Inside main W roll door @ 1m	435	7	3	1	0	0	1	1	2	2	2	1	1	0	1	0	0	0	0	1	1	1	0	1	0	0	
	F* Inside NW corner	436	6	2	2	2	1	1	1	2	1	0	0	1	1	0	1	1	1	1	0	1	0	1	0	1	0	
	I* W side by hydraulics bench	437	3	0	1	1	1	1	1	1	1	3	2	2	4	1	1	2	1	0	1	2	2	3	0	1	0	0
	J* inside vents	438	7	2	1	0	0	0	0	3	0	2	3	2	3	0	2	3	2	1	1	1	0	1	1	1	0	1
	J* SW corner by vents at baghouse	439	9	2	2	2	1	0	1	4	1	4	5	1	0	1	0	0	1	2	0	1	0	1	0	1	0	0
	N end under centre axis, groundlevel	446	4	2	2	0	1	2	0	1	0	1	2	1	3	1	0	1	0	1	1	0	1	1	0	1	0	0
	N end ground @ 2m	440	5	4	1	3	3	0	0	1	1	1	0	1	1	1	0	0	1	0	0	0	1	1	0	1	0	1
	Centre axis N end @ 2m	441	9	2	2	1	1	1	1	4	3	1	0	1	1	1	1	0	0	0	0	1	1	1	0	1	1	0
	Inside Door P N end of mill building @ 1m	442	6	4	2	3	5	2	1	2	0	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	1	0
	Inside E side mill centre at columns N end	443	4	1	1	0	1	0	1	2	0	2	1	2	1	0	0	0	1	0	1	0	1	1	0	0	1	0
	Inside E side mill centre at columns S end	444	5	2	2	0	2	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	1
	Inside NW corner mill room	445	8	3	2	3	0	0	1	2	2	0	0	2	3	0	1	0	0	0	0	0	0	1	0	1	1	0
	C701 platform	447	7	2	2	1	0	1	1	3	1	1	1	1	2	1	1	1	1	0	0	1	0	1	0	0	0	1
	Platform above centre centre mill	448	4	3	1	0	3	1	0	1	0	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	1
	Inside, above Mill drive gear S end	449	8	2	2	0	1	0	1	2	0	2	3	1	0	1	1	2	1	0	0	1	0	1	1	1	1	1
	Tower stairs at roof level	450	8	3	1	0	1	2	2	2	1	0	1	1	1	0	1	1	0	0	0	0	0	1	1	1	0	1
	1st platform above roof level in BE tower W side	451	8	3	1	1	0	1	1	3	0	1	2	1	0	1	1	1	1	1	0	1	0	0	1	1	0	1
	2nd platform in BE tower by fans FA703 & FA720, W side wall @ 1m	452	5	2	0	1	1	0	1	2	1	1	0	2	1	1	0	0	1	1	1	0	1	1	2	1	2	1
	Between Fans FA703 on & FA720 on	453	9	2	1	3	2	1	0	0	1	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	1	0
	At crossway to CM5 level, N side at transfer to conveyor	454	0	2	0	1	3	1	1	2	0	1	1	1	1	1	1	1	0	1	1	0	1	2	3	1	2	0
	At crossway to CM5 level, W side by wall @ 1m, BE @ 1.8m	455	4	4	1	1	2	0	1	2	0	0	0	0	0	0	0	1	1	1	1	0	1	2	3	1	2	1
	At W end crossway to CM5 by vent in S wall	456	0	2	2	1	1	1	1	2	1	1	2	1	0	0	0	1	0	0	1	0	1	1	2	0	2	1
	Top level BE tower W side NW corner	459	4	2	0	1	1	2	1	3	0	1	3	7	3	0	0	0	1	0	1	1	1	3	4	0	2	0
	Top level BE tower S side BE @ 0.8m	460	2	3	2	2	3	1	1	2	3	1	1	2	2	1	0	1	0	0	0	0	0	1	4	1	3	1
	Top level BE tower E side by drive motor end @ 0.8m	461	6	4	1	4	3	3	2	1	1	1	0	2	2	0	1	1	2	1	1	1	1	2	3	1	2	0
	Top level BE tower N side by drive motor end @ 0.8m	462	8	2	3	1	1	1	1	0	2	2	1	3	1	2	3	2	2	1	1	1	1	2	3	1	2	0
	Crossway to CM5 E end by opening in floor	457	3	4	2	2	1	1	0	0	1	1	2	2	0	0	0	1	0	0	0	0	0	0	2	0	1	2
	Crossway to CM5 by centre S wall vent	458	1	1	1	1	1	1	2	2	1	0	0	0	1	0	0	1	0	1	0	0	1	1	1	0	2	1
	Main baghouse SE corner top, 4m to E wall	464	10	1	4	1	3	3	1	1	1	1	2	2	1	0	0	1	2	2	1	0	0	0	1	0	1	1
	Main baghouse NE corner top, 4m to E wall	465	5	1	3	2	0	0	1	1	1	1	1	1	1	0	0	1	2	2	1	0	0	0	1	1	1	0
	Base of main baghouse SW corner	463	11	3	7	2	1	1	2	3	1	1	1	0	0	0	1	1	0	1	0	0	0	1	2	2	2	1
	CM7 FA701 motor & casing NE side @ 1.5m	467	8	4	1	3	1	0	3	4	1	3	4	1	1	1	0	0	1	3	1	0	1	2	4	2	3	2
	Compressor house inside W man door	468	0	2	2	3	2	1	5	1	0	1	1	3	1	1	0	0	1	1	0	2	1	1	1	1	1	0
	Compressor house inside by centre purge filter	469	4	1	1	1	0	1	1	2	1	1	1	3	1	1	0	0	1	0	2	3	2	2	0	2	1	1
	Compressor house inside E man door	470	0	3	3	3	1	2	1	1	0	0	2	3	1	1	1	1	0	0	1	0	0	1	0	1	0	2
	Compressor house inside centre	471	3	1	2	2	1	1	7	1	2	2	3	5	2	1	1	0	0	0	0	0	0	0	0	0	0	1
	Compressor house inside W man door	472	1	1	0	0	2	0	5	1	1	2	2	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1
	E Outside W roll door compressor house	473	9	3	1	1	0	1	0	3	0	2	1	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0
	SW side of mill motor fan @ 2m to casing inlet & discharge ducts	466	9	3	4	4	0	3	1	1	1	3	3	0	0	0	0	0	1	2	1	0	0	1	2	2	2	1

Table 3.6A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for CM7 & CM6

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																										
			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	
CM6	1 North West Corner @ 1m		6	1	7	4	1	1	0	1	1	1	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	1	
	2 Front of Roller Door @ 1m	626	5	3	4	1	0	1	2	0	1	1	2	1	1	1	0	1	1	0	0	1	0	0	0	1	0	1	
	2 Front of Roller Door @ 1m	626	6	0	5	2	1	0	1	2	1	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	
	3 Betgeen Door @ 1m	627	1	1	3	3	0	1	0	2	1	1	0	1	1	1	0	0	1	0	0	0	0	1	0	1	0	0	
	3 Betgeen Door @ 1m	627	2	1	3	2	0	2	1	2	2	1	1	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	
	4 Front of Roller Door @ 1m	628	3	0	4	1	1	1	0	2	1	0	0	1	1	1	0	0	0	1	1	1	0	0	1	0	0	1	
	4 Front of Roller Door @ 1m	628	3	1	4	2	0	1	0	2	0	1	1	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	
	5 Front of Southern Roller Door @ 1m	629	2	1	3	0	1	1	0	1	1	1	1	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	
	5 Front of Southern Roller Door @ 1m	629	4	0	3	1	0	1	1	2	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	1	0	1	
	6 Northern face of western ext @ 1m		2	1	6	3	3	1	2	1	2	2	1	0	0	2	1	0	0	0	1	0	0	1	0	1	1	0	0
	7 On CM5 Platform (N) @ 6.8m		2	2	5	2	1	1	0	2	1	1	1	0	0	1	0	0	1	0	0	0	0	2	0	0	0	1	
	8 Western face (N) of western ext @ 1m		6	2	0	0	1	1	1	2	0	0	1	2	1	1	0	0	0	0	1	0	1	1	0	1	0	1	
	9 Western face(S) of western ext @ 1m		2	3	3	1	2	0	1	2	1	0	0	0	1	2	0	0	0	1	0	0	1	1	0	1	0	1	
	10 On CM5 Platform (S) @ 6.8m	607	3	1	3	1	0	0	0	2	1	1	2	0	1	1	0	1	0	1	0	0	0	1	1	1	0	1	
	10 On CM5 Platform (S) @ 6.8m	607	6	0	5	3	1	0	0	2	1	1	1	1	0	1	0	1	0	0	1	0	0	1	0	1	0	0	
	11 14.5m from S wall at joint	608	1	4	4	1	0	1	1	3	3	0	2	1	0	0	2	1	1	1	1	2	0	1	1	0	0	2	
	11 14.5m from S wall at joint	608	1	0	1	0	1	2	1	2	2	0	3	2	1	2	3	4	3	0	1	2	1	1	3	1	1	0	
	12 6m from S wall CM6 at joint	609	0	3	0	5	1	2	0	3	1	1	3	1	1	2	3	5	3	1	0	2	1	3	0	0	1	1	
	12 6m from S wall CM6 at joint	609	1	1	2	5	2	1	1	2	2	2	5	2	1	1	0	5	2	1	0	3	3	2	2	1	1	0	
	13 E side S roll door @ 1m	610	1	0	2	1	1	1	1	1	0	5	11	5	1	0	2	0	0	1	0	1	1	1	0	1	0	0	
	13 E side S roll door @ 1m	610	1	0	1	3	2	0	0	0	1	3	6	2	2	0	0	2	1	1	2	3	1	0	1	0	1	1	
	14 CM6 E side centre door @ 1m	611	1	1	2	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	
	14 CM6 E side centre door @ 1m	611	2	0	0	1	0	1	0	1	1	2	1	2	1	0	1	1	0	0	0	0	0	1	0	1	0	1	
	15 2m from Clinker Building opp 13 & 14	612	1	1	0	0	1	2	1	1	0	0	1	0	0	1	0	1	2	0	0	0	0	0	1	0	0	1	
	15 2m from Clinker Building opp 13 & 14	612	3	2	0	0	0	1	1	0	2	2	2	1	1	0	1	1	1	1	0	1	0	0	0	0	0	1	
	16 E wall centre @ 2m	613	1	1	3	2	1	0	0	1	0	1	0	0	0	1	1	0	1	1	1	1	0	0	0	0	0	1	
	16 E wall centre @ 2m	613	3	0	1	1	0	1	0	0	1	0	1	1	1	0	0	0	0	1	0	1	0	1	0	1	1	3	
	17 E roll door opp Mill	614	2	0	2	1	1	1	1	1	1	1	1	2	0	0	0	1	2	1	1	1	2	0	1	0	2	1	
	17 E roll door opp Mill	614	2	0	2	1	0	1	2	0	1	2	2	1	0	0	1	1	2	1	0	1	3	1	0	0	2	1	
	18 Door opp Comp Room @ 1m	615	3	1	1	0	0	1	1	2	1	0	0	0	0	1	1	1	3	3	4	1	1	1	0	1	1	1	
	18 Door opp Comp Room @ 1m	615	3	0	2	0	1	0	1	1	0	1	1	1	3	0	3	1	7	6	1	4	3	0	2	0	0	0	
	19 Clinker Building @ 2m opp 18	616	3	1	2	1	0	0	1	1	1	0	2	0	2	1	1	0	2	2	1	0	2	0	1	1	1	1	
	19 Clinker Building @ 2m opp 18	616	2	0	4	3	0	0	1	0	1	1	1	0	1	1	1	1	0	1	1	2	1	0	0	1	1	0	
	20' Inside Filter Room @0.3m		2	4	5	5	0	1	3	0	1	1	3	2	0	1	0	2	1	0	0	1	1	1	1	1	1	0	
	20 Man door - open 100mm	617	1	0	1	1	1	0	0	1	0	1	1	2	1	4	2	1	3	2	1	1	1	1	1	0	0	1	
	20 Man door - open 100mm	617	2	1	1	1	1	1	0	1	1	1	1	1	2	0	1	2	3	2	4	3	2	1	1	1	2	2	
	21 1m Outside vent fan filter louvre	618	3	3	5	3	2	0	1	1	0	1	1	0	0	1	1	1	1	0	0	0	0	1	0	0	1	3	
	21 1m Outside vent fan filter louvre	618	2	5	4	3	1	2	2	2	1	1	2	2	2	1	0	1	0	1	0	1	1	1	2	0	0	1	
	22 E side N wall vent @ 1m	619	1	1	1	4	4	1	1	1	1	1	3	1	0	1	1	1	1	1	1	0	1	0	0	0	1	2	
	22 E side N wall vent @ 1m	619	3	0	1	4	4	1	2	1	0	2	2	1	1	0	0	0	0	0	0	1	0	1	2	0	1	1	
	23 Centre N wall vent @ 1m	620	0	0	1	3	4	2	2	0	1	0	1	2	1	1	1	0	0	1	0	1	1	1	2	0	0	0	
	23 Centre N wall vent @ 1m	620	1	0	1	3	4	1	1	0	0	1	2	1	0	0	1	0	1	0	0	1	0	1	1	0	1	2	
	24 W side N wall vent @ 1m	621	4	0	3	2	1	0	0	1	1	1	0	2	0	1	1	1	0	0	1	0	0	0	1	0	0	0	
	24 W side N wall vent @ 1m	621	3	0	2	2	1	0	1	0	2	1	0	2	1	2	1	0	1	0	0	1	0	0	1	0	2	3	
	25 11m N of CM6 at joint	622	5	1	5	5	2	1	2	0	0	0	1	1	2	1	0	0	1	1	0	1	1	2	2	1	1	2	
	25 11m N of CM6 at joint	622	5	1	3	3	1	0	1	0	0	0	2	1	0	1	1	2	1	0	1	0	1	1	1	0	0	1	
	26 22.6m N of CM6	623	6	1	4	0	1	3	1	0	1	2	1	1	0	0	0	1	2	1	2	2	0	1	1	1	0	1	
	26 22.6m N of CM6	623	6	2	5	5	1	1	2	0	0	2	3	1	0	2	1	0	2	1	1	1	0	0	0	1	2	1	
	27 4m N of Conveyor transfer out of Clinker Building	624	2	1	10	6	0	1	0	0	1	1	0	0	2	1	1	1	1	1	0	0	1	0	1	0	0	1	
	28 4m N of dust collector on next building W , conveyor transfer noise	625	4	3	10	6	3	1	0	0	0	1	1	1	0	1	2	2	0	0	0	0	1	0	0	1	0	0	
	Door platform near CM6 W wall fan @ 7m	190	7	3	1	1	3	2	1	0	2	1	1	1	1	1	1	1	2	1	0	1	1	1	0	1	2	0	
	Door platform near CM6 W wall fan @ 3.5m	191	5	2	1	0	3	2	2	1	2	2	3	2	3	0	2	1	1	0	1	1	1	0	1	1	1	0	

Table 3.6A CM7 CM6 Frequency Tonality p.3

Table 3_2

Table 3.7: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Cement Mill No.7 and CM6

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results										
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019-2018	2019-2017	2019-2016	2019-2015	2019-2014	2019-2013	2019-2012	2019-2011	2019-2010	2018-2009	
CM7	A Top of stairs S	73	72	73	72	72	71	72	73	73	72	71	73	69	70	0	1	1	0	0	1	2	0	4	3	
	A Top of stairs S	73	72	73	72	72	71	72	73	73	72	71	73	69	70	0	1	1	0	0	1	2	0	4	3	
	A Top of stairs S - CM6 & 7 off			69	68																					
	B 2m W of wall, edge of barrier facing baghouse	79	78																							
	B 2m W of wall, edge of barrier facing baghouse	75	75																							
	B' 1m S of of mill motor fan discharge, @ 1.7m above ground	77	77																							
	C Top of stairs N	72	72	73	73	72	72	72	73	71	71	71	71	70	72	-1	0	0	0	1	1	2	1	2	0	
	C Top of stairs N	72	71	73	73	72	72	72	73	71	71	71	71	70	72	-1	-1	-1	-1	1	1	1	0	2	0	
	C' Bottom of stairs N	72	72																							
	C Top of stairs N - CM6 & 7 off			67	66																					
	D At corner N of Admin	74	73	75	74	71	70	72	72	72	70	69	68	67	73	-2	3	1	1	2	3	4	5	7	1	
	D At corner N of Admin - CM6 & 7 off			65	64																					
	E Compressor room door @ 1m	70	70	72	72	69	69	71	72	74	73	74	75	76	76	-2	1	-1	-2	-4	-2	-3	-5	-6	-6	
	E' Man door to compressor filter room@ 1m	69	69	71	71	69	69	69	71	70	69	71	71	69	74	-2	0	0	-1	-1	0	-2	-2	0	-5	
	F Wall vents N on W side @ 1m	75	75	78	77	76	76	76	76	77	77	77	75	76	77	-2	-1	-1	-1	-2	-2	-1	0	-1	-2	
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7	74	73	74	74	73	72	75	75	74	72	70	68	69	78	-1	0	-1	-1	-1	1	4	6	5	-5	
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7 - CM6 & 7 off			65	64																					
	I Vent S of door @ 1m	76	76	79	78	77	77	77	78	78	79	79	87	78	78	-3	-1	-1	-2	-2	-3	-3	-11	-2	-2	
	J Vents N of baghouse	78	78	80	79	77	77	78	77	79	80	86	89	83	83	-1	1	1	1	0	-1	-8	-11	-5	-5	
	J' Edge of concrete opp, J.	76	75	72	71	73	73	74	75	74	75	78	84	77	80	4	2	2	1	1	1	-2	-9	-1	-4	
	H W roller door @ 1m	81	80	81	81	82	82	81	80	80	81	80	77	78	78	0	-1	0	2	1	1	1	4	3	3	
	H W roller door @ 1m	79	79	81	81	82	82	81	80	80	81	80	77	78	78	-2	-3	-2	-1	-1	-2	-2	2	1	1	
	H W roller door @ 1m - CM6 & 7 off			66	66																					
	H' Edge concrete opp door H	73	73	74	74	78	77	75	74	75	75	76	74	75	74	-1	-4	-1	-1	-2	-2	-2	-1	-2	-1	
	H' Edge concrete opp door H	74	74	74	74	78	77	75	74	75	75	76	74	75	74	0	-4	-1	0	-1	-1	-2	0	-1	0	
	H' Edge concrete opp door H - CM6 & 7 off			65	65																					
	K Line level with G centre of compressor house	72	72	74	74	74	72	72	74	72	71	72	68	69	78	-2	-1	0	-2	0	1	0	5	3	-6	
	K Line level with G centre of compressor house - CM6 & 7 off			64	64																					
	L N wall vent W side @ 1m	72	71	74	73	71	71	73	74	73	72	70	79	71	76	-2	0	-1	-2	-2	0	2	-7	1	-4	
	M Between wall vents @ 1m to wall	71	70	77	76	70	69	73	74	73	72	70	79	71	76	-7	1	-2	-3	-3	-1	1	-8	-1	-6	
	N Wall vents N wall E side @ 1m	71	70	73	72	71	70	71	71	71	69	69	67	70	76	-2	0	-1	0	0	2	2	4	1	-5	
	O Line E side of Comp House 13.5m to control point	72	71	76	75	72	71	73	75	73	72	70	67	67	78	-4	0	-2	-3	-1	0	2	5	5	-6	
	O Line E side of Comp House 13.5m to control point - CM6 & 7 off			64	63																					
	P 1m N roll door CM7	80	80	82	81	81	80	81	81	80	81	81	76	79	87	-2	-1	-1	-1	0	-1	-1	3	1	-7	
	P 1m N roll door CM7 - CM6 & 7 off			67	67																					
	R corner SW of CM7	75	74	75	74	77	76	76	75							0	-2	-1	0							
	R corner SW of CM7	76	75	75	74	77	76	76	75							1	-1	0	1							
	R corner SW of CM7 - CM6 & 7 off			70	69																					
	S' Kerb Opp W wall CM7	74	73	74	74	74	74	74	74							-1	0	-1	-1							
	S' Kerb Opp W wall CM7	75	74	74	74	74	74	74	74							0	1	0	0							
S' Kerb Opp W wall CM7 - CM6 & 7 off			71	70																						
S Kerb opp W side CM7 tower	72	72																								
S Kerb opp E side CM7 tower	75	75	75	75	75	74	75	76							0	1	0	-1								
S Kerb opp E side CM7 tower	72	72	75	75	75	74	75	76							-3	-2	-3	-4								
S Kerb opp E side CM7 tower - CM6 & 7 off			71	70																						
T Kerb Opp W wall CM5	73	73	75	74	74	73	75	76							-2	0	-1	-2								
T Kerb Opp W wall CM5	76	75	75	74	74	73	75	76							1	2	1	0								
O Line E side of Comp House 13.5m to control point - CM6 & 7 off			64	63												0	0	0	0	0	0	0	0	0		
T Kerb Opp W wall CM5 - CM6 & 7 off			71	71																						
Under TS3 ground level 13.8 m from CM7	72	72																								
Transfer Station #TS3 Level 1 N side opening	74	74	73	73	73	72	71	71							1	1	4	3								
TS3 Platform opp fan discharge	74	74	74	73	74	73	75	75	77	75	77	75	74		0	1	-1	-1	-3	-1	-3	-1	0			
TS3 stair opp fan discharge from CM5 annex			73	72	75	74	75	75	77	75	77	75	74											0		

Table 3.7: CM7 Compare 2019 to previous p.1

Table 3.7: Boral Cement Berrima Annual Noise 2019 - Comparison of LAeq results with those pf Previous Years for Cement Mill No.7 and CM6

Area	Location	Statistical Sound Level Result for Annual Assessment														Difference 2019 to Previous LAeq results										
		LAeq 2019	LA90 2019	LAeq 2018	LA90 2018	LAeq 2017	LA90 2017	LAeq 2016	LAeq 2015	LAeq 2014	LAeq 2013	LAeq 2012	LAeq 2011	LAeq 2010	LAeq 2009	2019- 2018	2019- 2017	2019- 2016	2019- 2015	2019- 2014	2019- 2013	2019- 2012	2019- 2011	2019- 2010	2018- 2009	
CM6	1 North West Corner @ 1m	79	79	85	85	79			80	82	80	81				-6	1		-1	-3	-1	-2				
	1 North West Corner @ 1m	79	79	85	85				80	82	80	81				-6			-1	-3	-1	-2				
	2 Front of Roller Door @ 1m	80	80	89	89				81	83	81	81		82		-9			-1	-2	0	0			-2	
	2 Front of Roller Door @ 1m	87	87	89	89				81	83	81	81		82		-2			6	5	7	7			5	
	3 Between Door @ 1m	80	80	81	80				79	80	80	81		81		-1			1	0	0	-1			-1	
	3 Between Door @ 1m	79	78	81	80				79	80	80	81		81		-2			0	-2	-1	-2			-2	
	4 Front of Roller Door @ 1m	81	81	84	84				83	83	82	82		82		-3			-1	-2	-1	-1			-1	
	4 Front of Roller Door @ 1m	81	81	84	84				83	83	82	82		82		-3			-1	-2	-1	-1			-1	
	5 Front of Southern Roller Door @ 1m	80	80	82	81				81	81	84	81		81		-2			-1	-1	-4	-1			-2	
	5 Front of Southern Roller Door @ 1m	81	81	82	81				81	81	84	81		81		-1			0	0	-3	0			0	
	6 Northern face of western ext @ 1m	78	77	79	78				82	79	80	79		80		-1			-5	-2	-3	-2			-2	
	7 On CM5 Platform (N) @ 6.8m	77	77	77	77				77	78	79			78		0			1	-1	-2				-1	
	8 Western face (N) of western ext @ 1m	76	76	77	76				76	77	77	78		74		0			0	-1	-1	-1			3	
	9 Western face(S) of western ext @ 1m	76	76	76	76				75	77	76	77		73		0			1	-1	0	-1			3	
	10 On CM5 Platform (S) @ 6.8m	75	75	77	76				75	78	76			74		-2			0	-3	-1				1	
	10 On CM5 Platform (S) @ 6.8m	77	76	77	76				75	78	76			74		0			2	-1	1				3	
	11 14.5m from S wall at joint	78	76	76	75	77	76	78	76	78	77	79		77		2	1	0	2	0	1	-1			1	
	11 14.5m from S wall at joint	76	75	76	75	77	76	78	76	78	77	79		77		0	-1	-2	0	-2	-1	-3			-1	
	12 6m from S wall CM6 at joint	80	80	83	82											-3										
	12 6m from S wall CM6 at joint	79	78	83	82											-4										
	13 E side S roll door @ 1m	77	76	76	76	73	73	75	80	81	82	82		83		0	4	1	-3	-5	-5	-5			-7	
	13 E side S roll door @ 1m	77	77	76	76	73	73	75	80	81	82	82		83		1	4	2	-2	-4	-4	-5			-6	
	14 CM6 E side centre door @ 1m	84	84	80	80	75	75	76	74	75	77	74		74		5	10	9	10	10	7	11			10	
	14 CM6 E side centre door @ 1m	79	78	80	80	75	75	76	74	75	77	74		74		-1	4	3	5	4	2	5			5	
	15 2m from Clinker Building opp 13 & 14	75	74	76	76	72	71	73	78	78	89	79				-2	3	2	-3	-4	-14	-4			75	
	15 2m from Clinker Building opp 13 & 14	77	76	76	76	72	71	73	78	78	89	79				1	5	4	-1	-2	-12	-2			77	
	16 E wall centre @ 2m	75	74	80	79	72	72	73	74	75	80	74		77		-5	2	1	1	0	-5	0			-3	
	16 E wall centre @ 2m	76	75	80	79	72	72	73	74	75	80	74		77		-4	3	3	2	1	-4	2			-1	
	17 E roll door opp Mill	83	83	96	95	80	79	82	74	75	78	77		75		-13	3	1	9	8	5	7			8	
	17 E roll door opp Mill	82	81	96	95	80	79	82	74	75	78	77		75		-14	2	0	8	7	4	5			7	
	18 Door opp Comp Room @ 1m	79	75	81	79	79	78	76	82	83	85	82		85		-2	1	3	-3	-4	-6	-3			-6	
	18 Door opp Comp Room @ 1m	81	80	81	79	79	78	76	82	83	85	82		85		0	2	4	-2	-3	-5	-2			-4	
	19 Clinker Building @ 2m opp 18	74	74	79	78	74	73	72	77	77	75	77		76		-4	1	2	-2	-3	-1	-3			-1	
	19 Clinker Building @ 2m opp 18	75	75	79	78	74	73	72	77	77	75	77		76		-4	2	3	-1	-2	0	-2			0	
	20 Inside Filter Room @0.3m	75	75																							
	20 Man door - open 100mm	75	74	76	76	75	74	73	75	75	78	73		72		-2	0	2	0	0	-3	2			3	
	20 Man door - open 100mm	74	74	76	76	75	74	73	75	75	78	73		72		-2	-1	1	-1	-1	-4	1			2	
	21 1m Outside vent fan filter louvre	74	73	76	76	72	71	72	73	75	72	74		74		-2	2	2	1	-1	2	-1			0	
	21 1m Outside vent fan filter louvre	74	74	76	76	72	71	72	73	75	72	74		74		-2	2	3	1	0	2	0			0	
	22 E side N wall vent @ 1m	81	80	84	83	75	75	82	82	84	81	83		85		-3	6	-1	-2	-3	0	-2			-4	
	22 E side N wall vent @ 1m	81	81	84	83	75	75	82	82	84	81	83		85		-3	6	-1	-1	-3	0	-2			-4	
	23 Centre N wall vent @ 1m	84	84	85	85	80	80	83	84	86	84	85		86		-1	4	1	0	-2	0	-1			-2	
	23 Centre N wall vent @ 1m	84	84	85	85	80	80	83	84	86	84	85		86		-1	4	1	0	-2	0	-1			-2	
	24 W side N wall vent @ 1m	80	80	82	81	78	77	80	78	81	81	81		83		-1	3	1	2	-1	0	-1			-3	
	24 W side N wall vent @ 1m	81	80	82	81	78	77	80	78	81	81	81		83		-1	3	1	2	-1	0	-1			-3	
	25 11m N of CM6 at joint	74	73	74	73	70	69	74	74	75	74					0	4	-1	0	-2	0					
25 11m N of CM6 at joint	75	74	74	73	70	69	74	74	75	74					1	5	1	1	-1	1						
26 22.6m N of CM6	71	71	71	70	69	68	80	71	72	74	75		77		0	2	-9	0	-1	-3	-4			-6		
26 22.6m N of CM6	71	71	71	70	69	68	80	71	72	74	75		77		1	3	-9	0	-1	-2	-4			-6		
27 4m N of Conveyor transfer out of Clinker Building	77	76																								
28 4m N of dust collector on next building W , conveyor transfer noise	77	77																								
Door platform near CM6 W wall fan @ 7m	85	84																								
Door platform near CM6 W wall fan @ 3.5m	92	91																								

Table 3.7: CM7 Compare 2019 to previous p.2

Table 3.7B: Boral Cement Berrima Annual Noise 2019 - Site Sound Levels for CM7 Project - Inside CM7 building - changes compared to 2017

Location	Measured LAeq,t			Differences	
	2019	2018	2017	2019-2018	2019-2017
H* Inside main W roll door @ 1m	95	93	95	1	-1
F* Inside NW corner	92	90	92	1	-1
I* W side by hydraulics bench	94	93	95	2	0
J* inside vents	92	91	92	0	0
J* SW corner by vents at baghouse	89	90	89	0	1
N end under centre axis, ground level	96	92	94	4	2
N end ground @ 2m	94	93		1	
Centre axis N end @ 2m	98		95		3
Inside Door P N end of mill building @ 1m	94		94		-1
Inside E side mill centre at columns N end	100		101		-2
C701 platform	91	90	92	1	0
Platform above centre centre mill	92	92	93	0	-1
Tower stairs at roof level	89	89	91	0	-1
1st platform above roof level in BE tower W side	86	85	86	0	0
2nd platform in BE tower by fans FA703 & FA720, W side wall @ 1m	82	82	83	0	0
Between Fans FA703 on & FA720 on	84	83	84	0	0
At crossway to CM5 level, N side at transfer to conveyor	82	81	82	0	0
At crossway to CM5 level, W side by wall @ 1m, BE @ 1.8m	82	81	82	1	0
At W end crossway to CM5 by vent in S wall	79	79	77	0	2
Top level BE tower W side NW corner	83	82	82	1	1
Top level BE tower S side BE @ 0.8m	82	81	81	1	1
Top level BE tower E side by drive motor end @ 0.8m	84	80	84	3	-1
Crossway to CM5 E end by opening in floor	76	77	77	-1	-1
Main baghouse NE corner top, 4m to E wall	84	86	86	-2	-2
Base of main baghouse SW corner	85	86	86	-1	-1
CM7 FA701 motor & casing NE side @ 1.5m	89		89		0
SW side of mill motor fan @ 2m to casing inlet & discharge ducts	86	87	86	-1	0

Table 3.8: Boral Cement Berrima Works 2018 Annual Environmental Noise Assessment for CM7 Project - Measurement locations with increase in sound level > 3 dB and calculated contribution sound level at receivers

Location	Year	Time	Period sec	Sound Level dB(A) L _{AEQ,t}	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	Argyle	South
						Objective Night	40	40	40	40	37
CM7											
A Top of stairs S	2019	3:43 PM	30	73	Distance	25	546	636	628	791	1615
	2010			69	Source after DIR		57	61	64	68	61
Difference 2018 - 2010			Difference	4	Distance reduction		-27	-28	-28	-30	-36
					Calculated SPL without barriers		30	33	36	38	24
Noise is from other sources, not just CM7											
D At corner N of Admin	2019	2:16 PM	53	74	Distance	23	514	611	615	781	1664
	2010			67	Source after DIR		74	74	74	74	49
Difference 2018 - 2010			Difference	7	Distance reduction		-27	-28	-29	-31	-37
					Calculated SPL without barriers		47	45	45	43	11
Noise is from other sources, not just CM7											
G - Line N side of transfer house 13.5m to it, in-line W edge CM7	2019	2:42 PM	33	74	Distance	13.5	517	611	610	773	1647
	2011			68	Source after DIR		74	74	74	74	38
Difference 2017 - 2011			Difference	6	Distance reduction		-32	-33	-33	-35	-42
					Calculated SPL without barriers		42	40	40	38	-4
Noise is from other sources, including CM6, not just CM7											
J' Edge of concrete opp, J.	2019	2:33 PM	40	76	Distance	1	551	641	633	796	1610
	2018			72	Source after DIR		65	68	69	70	68
Difference 2019 - 2011			Difference	4	Distance reduction		-55	-56	-56	-58	-64
					Calculated SPL without barriers		10	11	13	12	3
Noise is from other sources, including CM6, not just CM7											
CM7 H W roller door @ 1m F56	2019	3:39 PM	44	82	Distance	1	546	636	628	791	1615
	2011			77	Source after DIR		66	69	72	69	69
Difference 2019 - 2011			Difference	5	Distance reduction		-55	-56	-56	-58	-64
					Calculated SPL without barriers		11	13	17	11	5
Transfer Station #TS3 Level 1 N side opening	2019	4:57 PM	33	74	Distance	1	514	611	615	781	1664
	2016			71	Source after DIR		74	74	74	74	47
Difference 2019 - 2016			Difference	3	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		20	18	18	16	-17

Table 3.8: Boral Cement Berrima Works 2018 Annual Environmental Noise Assessment for CM7 Project - Measurement locations with increase in sound level > 3 dB and calculated contribution sound level at receivers

Location	Year	Time	Period sec	Sound Level dB(A) L _{AEQ,t}	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	Argyle	South
						Objective Night	40	40	40	40	37
CM6											
2 Front of Roller Door @ 1m	2019	3:33 PM	35	87	Distance	1	532	633	639	813	1665
	2017			79	Source after DIR		69	71	75	77	75
Difference 2018 - 2017			Difference	8	Distance reduction		-39	-41	-41	-43	-49
					Calculated SPL without barriers		30	30	34	34	26
Door is fully open											
13 E side S roll door @ 1m	2019	3:17 PM	31	77	Distance	1	664	761	758	911	1533
	2017			73	Source after DIR		56	54	50	45	55
Difference 2018 - 2012			Difference	4	Distance reduction		-56	-58	-58	-59	-64
					Calculated SPL without barriers		0	-4	-8	-15	-9
Significant barriers also to each receiver. Influenced by the door open 500mm at bottom and the adjacent door open 1m											
14 CM6 E side centre door @ 1m	2019	3:18 PM	39	84	Distance	1	574	673	677	845	1629
	2012			74	Source after DIR		63	60	56	51	61
Difference 2018 - 2012			Difference	11	Distance reduction		-55	-57	-57	-59	-64
					Calculated SPL without barriers		7	3	0	-8	-3
Significant barriers also to each receiver. Door open 1m at bottom											
15 2m from Clinker Building opp 13 & 14, 10.7m to CM6	2019	3:19 PM	33	77	Distance	10.7	541	653	658	833	1660
	2016			73	Source after DIR		56	53	49	44	54
Difference 2019 - 2016			Difference	4	Distance reduction		-34	-36	-36	-38	-44
					Calculated SPL without barriers		21	17	14	6	10
Significant barriers also to each receiver. Influenced by the partly open doors at position 13 and 14											
17 E roll door opp Mill - door open	2019	3:21 PM	39	82	Distance	1	541	653	658	833	1660
	2015			74	Source after DIR		59	56	52	47	58
Difference 2016 - 2010			Difference	8	Distance reduction		-55	-56	-56	-58	-64
					Calculated SPL without barriers		5	0	-4	-12	-7
Significant barriers also to each receiver, also influenced by the open door at position 17											
18 Door opp Comp Room @ 1m	2019	3:22 PM	30	81	Distance	1	536	648	653	828	1665
	2016			76	Source after DIR		56	53	49	43	54
Difference 2016 - 2010			Difference	4	Distance reduction		-55	-56	-56	-58	-64
					Calculated SPL without barriers		1	-4	-8	-15	-10
Significant barriers also to each receiver, also influenced by the open door at position 17											
22 E side N wall vent @ 1m	2019	3:25 PM	30	81	Distance	1	525	626	639	812	1677
	2017			75	Source after DIR		81	81	81	79	63
Difference 2019 - 2017			Difference	6	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		27	25	25	21	-1
Reason for increase unclear											
23 Centre N wall vent @ 1m	2019	3:26 PM	30	84	Distance	1	525	626	639	812	1677
	2017			80	Source after DIR		84	84	84	82	64
Difference 2019 - 2017			Difference	4	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		29	28	28	24	0
25 11m N of CM6 at joint	2019	3:28 PM	35	75	Distance	11	525	626	639	812	1677
	2017			70	Source after DIR		75	75	75	70	41
Difference 2019 - 2017			Difference	5	Distance reduction		-34	-35	-35	-37	-44
					Calculated SPL without barriers		41	40	39	32	-2
Other sources contributing here as well as CM6											

4. Residential receiver sound levels - review for 2019

Environmental sound levels are measured at residential receiver locations in New Berrima. The same three locations are used each year to provide an on-going comparison from year to year.

Measurements are also made at the central section of the northern boundary of the Berrima Cement Mill and a location in the south eastern corner of the Stores Yard near the cross-road north of the Fettle's Shed. An additional residential location at 30 Adelaide Street was added for the 2018 survey to provide a background prior to commencement of the Austral Bricks Quarry later in 2018.

Measurements are made by a combination of attended and unattended measurements. Attended measurements were made at five residential receiver locations during daytime, evening and night-time periods on 10 September and 2 October 2019. Unattended measurements were made at four residential receiver locations between 10 and 26 September 2019. Site boundary measurements covered the same period for the Northern Boundary. Problems with water or heat affected the logger at the Stockyard Close location and these measurements were repeated from 6 to 19 November 2019.

4.1 Unattended measurement results

Unattended measurements were made using logging sound level meters at 6 locations, shown in Figure 1.2:

- Residential:
 - o 4 Melbourne Street, New Berrima (full results provided in Appendix B) for the period 10 to 26 September.
 - o 72 Taylor Avenue (near Adelaide Street), New Berrima (full results provided in Appendix C) for the period 10 to 24 September.
 - o 12 Brisbane Street, New Berrima (full results provided in Appendix D) for the period 10 to 23 September.
 - o 30 Adelaide Street, New Berrima (full results provided in Appendix E) for the period 10 to 22 September.
- Boral Cement industrial site:
 - o Northern Boundary at the north-western corner of the Stores Yard (full results provided in Appendix F) for the period for the period 10 to 26 September. Other measurements were also obtained for 15 to 28 October and 6 to 9 November for future reference
 - o South-western corner of the Stores Yard, north of the internal cross road north of the Fettle's Shed (full results provided in Appendix G) for the period for the period 6 to 19 November.

Monitoring instruments measured the sound levels continuously and stored the statistical results every 15-minutes. The logger at the Northern Boundary also stored all of the sound levels to allow processing of other parameters, such as $L_{A01,1\text{-minute}}$.

During the period of measurements, the Kiln was not operating for a period of 118 hours between 20:50 on 22 September to 18:36 on 27 September. The Raw Mills were off for the same period as well as for extended periods at other times separately. RM6 was off for 25 hours from 11pm on 1 October to 3am on 3 October. RM7 was off for 36 hours from midnight on 10 September to noon on the 11 September, 25 hours from midnight on 11 September to 1 am on 13 September, as well as 12 hours from 3pm on 18 September to 3am on 19 September and other 1 to 5 hour periods. Because of

this the major stack fans FA39 and FA250, as well as raw mill feed fans FA38 and FA249 were at reduced speeds for different periods in the monitoring survey. Cement Mill 7 had idle periods from 15 minutes to 35 hours and Cement Mill 6 had idle periods from 7 minutes to 24 hours. Table 1.1 shows the times of non-operation of the major plant items and Figure 1.4 shows the non-operating periods graphically. Some of these periods will have affected measured sound levels at the residential receivers and some will not.

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 12 to 16 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

Weather conditions

Weather is measured at the site meteorology station to the south of the Raw Materials Store. A summary of the weather conditions for the period 10 to 26 September when the residential monitoring was done is shown in Figure 4.1, with those relevant to noise propagation and measurement (wind speed, wind direction and rainfall) is shown in Figure 4.2. Wind speed and rainfall are shown in Figure 4.3 and wind direction is shown alone on Figure 4.4. Weather conditions for subsequent groups of three-day periods are shown in Figures 4.5 to Figure 4.10.

Daytime temperatures ranged from cool 10°C to mild 24°C. Night-times were cool with some close to 0°C. Wind direction was mainly westerly when there was wind greater than 1m/s, apart from a period from 16 to 18 September when it was South to South-east, followed by a period from 19 to 21 September when it was north-easterly. At times the wind speed was strong, averaging above 10m/s for short periods on 12th, 16th and 24th September, but most of the time the wind speeds were in the

range 2 to 6 m/s.. Data for the high wind speed periods greater than 10m/s were discarded as it was likely wind speeds at or close to the microphones were above 5m/s. During very low wind speed periods the wind direction was variable. 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. Weather conditions for the monitoring at the Store Yard Close location done from 6 to 19 November had higher wind speeds for longer periods and are described later.

Rain occurred on a number of days for brief periods, with a continuous period occurring from 10pm on 16th and most of 17th September. Data from rain periods was deleted for this assessment.

Table 4.1 provides a summary of the statistical data for all sites over the full period of the monitoring.

The results show that for average period L_{Aeq} values, 4 Melbourne Street was the quietest of the three usual residential locations for the day period with 53 dBA, although the Northern Boundary and 30 Adelaide St had 51 dBA daytime averages. Evening sound levels were low again at 4 Melbourne St. with 48 dBA while 30 Adelaide St. had 47 dBA. The same occurred for night-time with 4 Melbourne St. having 47 dBA and 30 Adelaide St. had 46 dBA. 72 Taylor Avenue had the same results for evening and at night-time at 54 dBA and also had the highest of all locations other than the Store Yard Close for all periods with 60 dBA in daytime. Store Yard Close results were higher than previous and this is considered because of the high wind speeds during its monitoring period.

For average period L_{A90} values, 4 Melbourne St. had the lowest sound levels in each period and 42 dBA at night-time. 72 Taylor Avenue had the highest residential values for this parameter with 48 dBA average in daytime and 47 dBA in evening and night-time periods. Store Yard Close location had average period L_{A90} values of 52 to 53 dBA, which are below the proposed objective of 56 dBA.

For the median 10% $L_{A90,period}$ sound levels, 4 Melbourne St. had the lowest values with 40 dBA in daytime and evening and 39 dBA during night-time. 30 Adelaide St. also had 40 dBA for this parameter for all periods. 72 Taylor Avenue had the highest of the residential results with 44 to 45 dBA.

As in previous years, these results continue to demonstrate that road traffic noise has a more significant effect on receiver L_{Aeq} sound levels than the Cement Plant.

The Store Yard Close location had period average $L_{A90,period}$ sound levels of 53 dBA in daytime and night and 52 dBA in evening, which is less than the proposed objective of 56 dBA. These are the same as in 2018 for night-time and higher by 1 dB for daytime and lower by 1 dB for evening.

Table 4.2 compares the long-term average results for 2018 with those measured since 2002. Results for residential locations were lower or the same as in 2018 and the long-term average (4 Melbourne St.) similar for other locations and higher for some for some periods (12 Brisbane and 72 Taylor). Overall there were no significant changes. These are described in the following sections for each location. The higher average wind speeds may also have contributed to higher period L_{Aeq} sound levels at the Store Yard Close location.

Figures 4.11 to 4.16 show graphs of the long-term average results as a type of time history comparison for each site. These graphs also indicate there have been no significant increases in long-term sound levels from 2018 to 2019 or since measurements commenced in 2002. This further indicates that the projects Kiln 6 Upgrade and No.7 Cement Mill are achieving compliance with their objectives.

**Figure 4.1: Boral Cement Berrima Annual Noise - Met Conditions
10 to 26 September 2019**

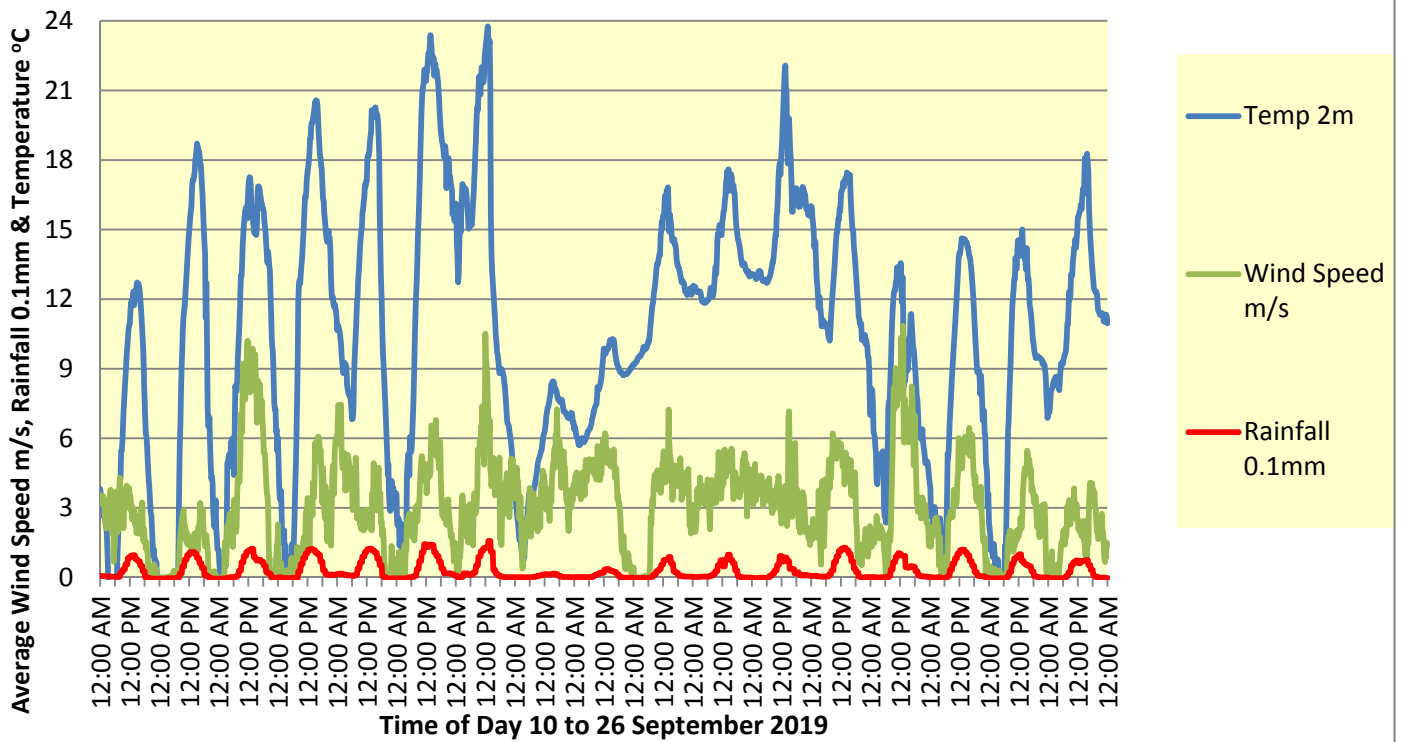


**Figure 4.2: Boral Cement Berrima Annual Noise - Met Conditions
10 to 26 September 2019**

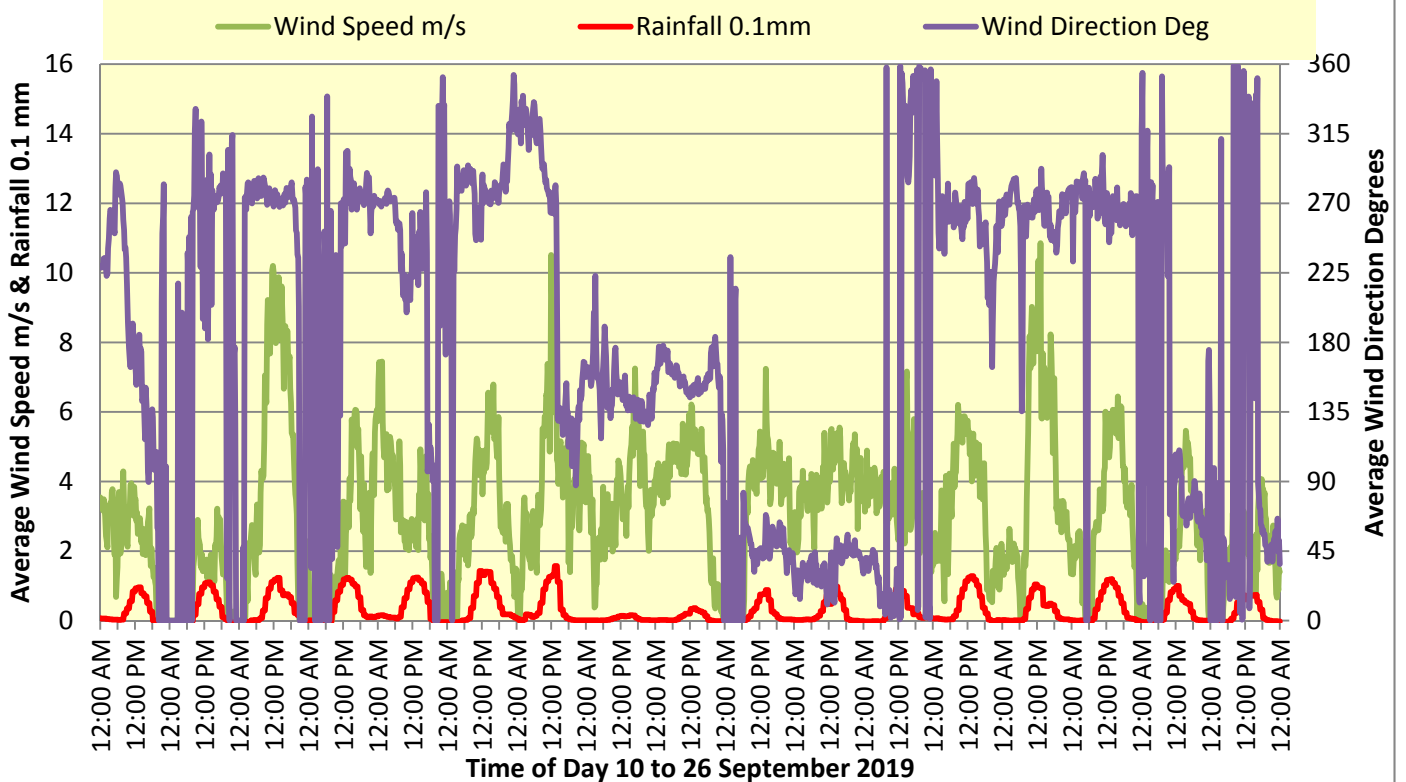


**Figure 4.3: Boral Cement Berrima Annual Noise - Met Conditions
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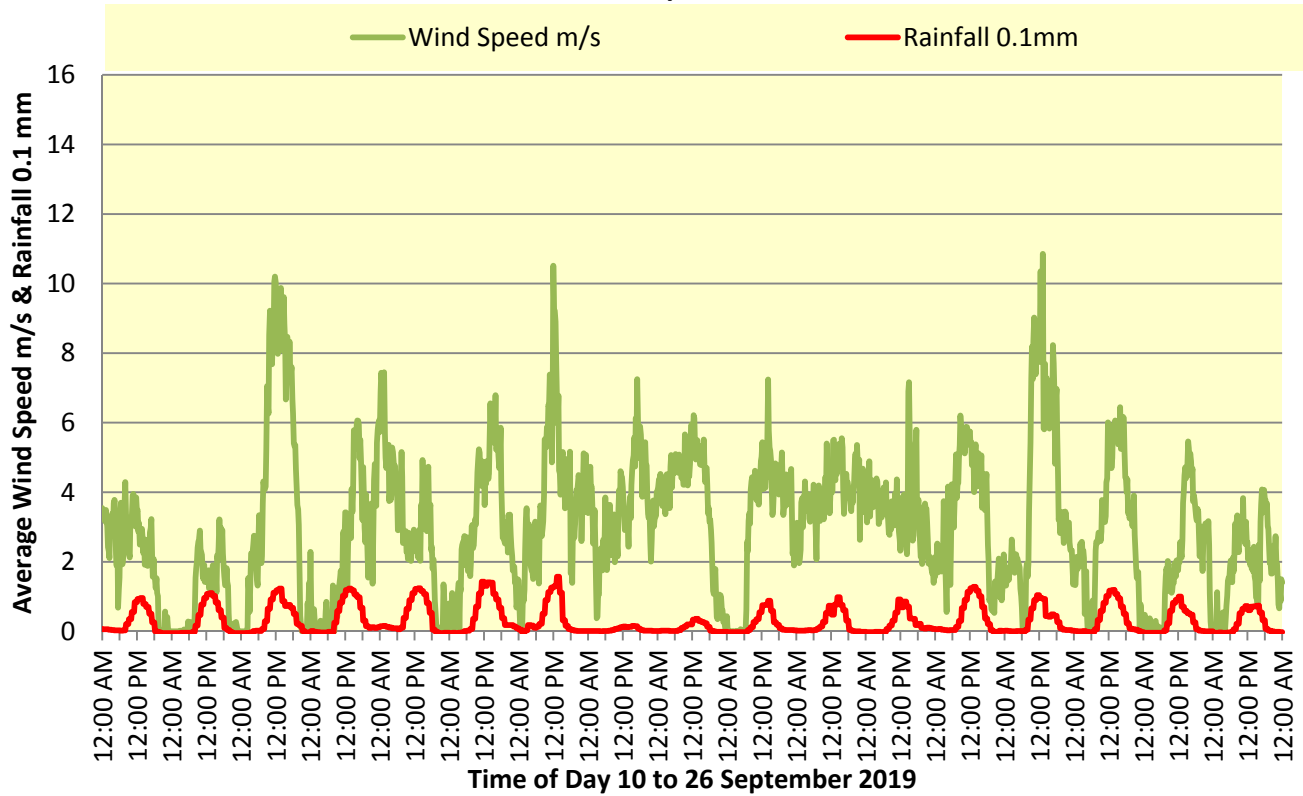


**Figure 4.4: Boral Cement Berrima Annual Noise - Met Conditions
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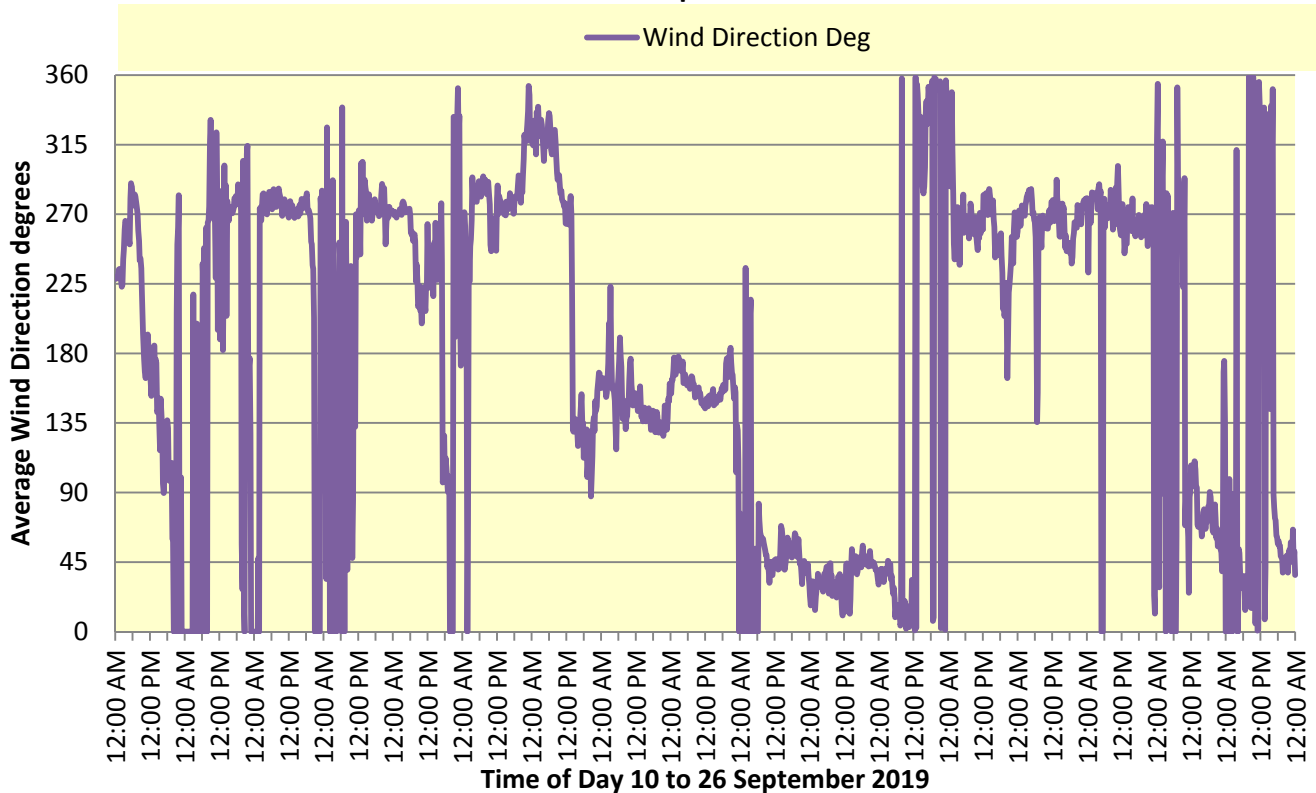


**Figure 4.5: Boral Cement Berrima Annual Noise - Met Conditions
10 to 26 September 2019**

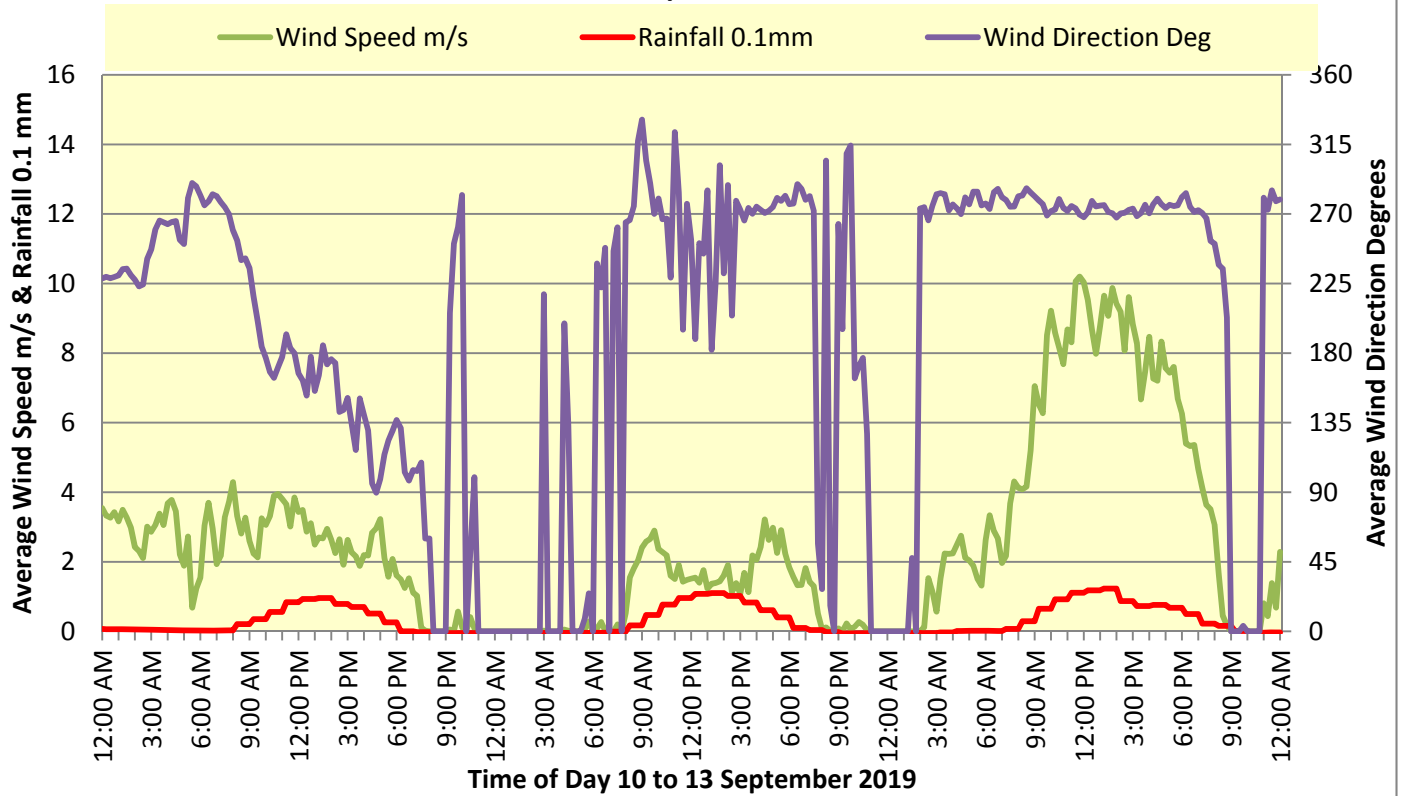


**Figure 4.6: Boral Cement Berrima Annual Noise - Met Conditions
10 to 26 September 2019**

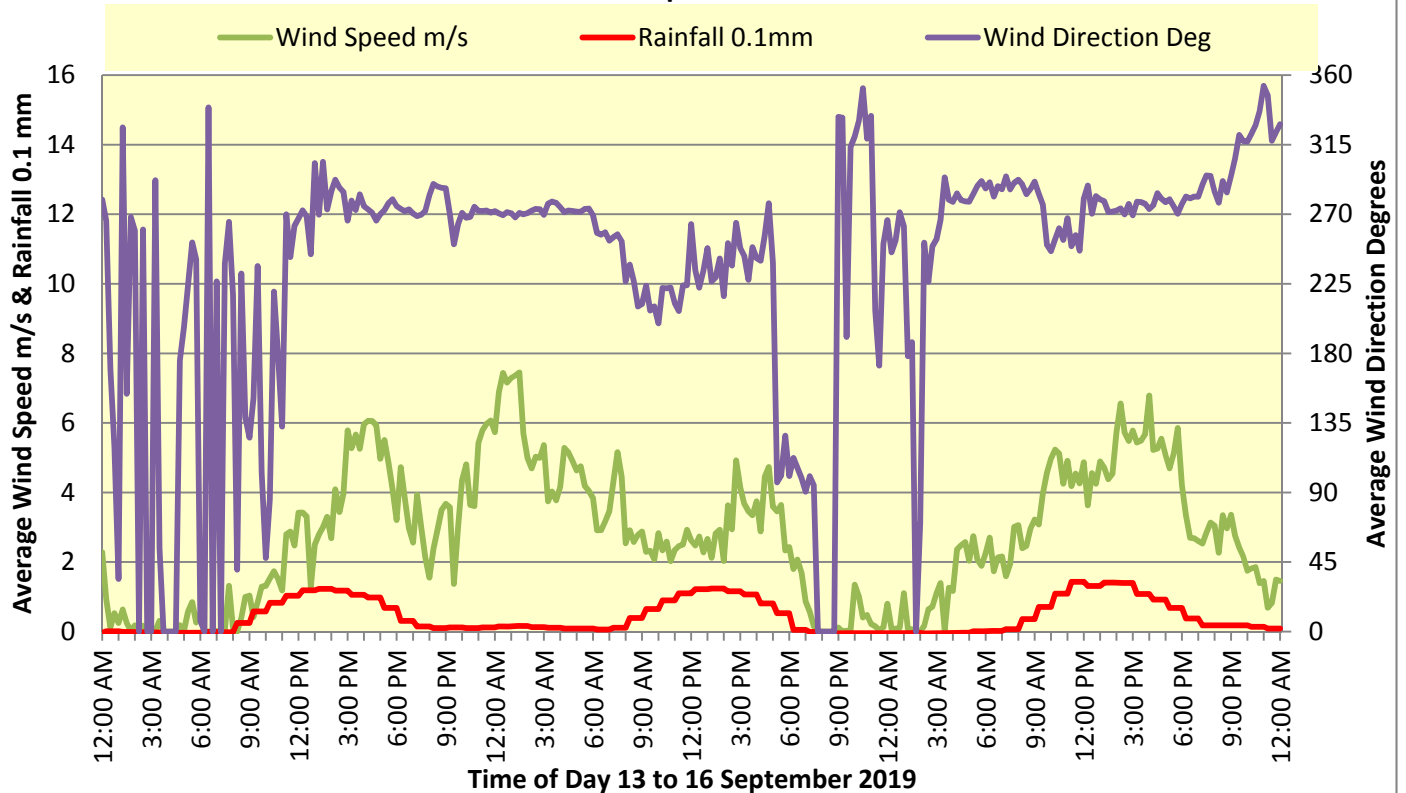


**Figure 4.7: Boral Cement Berrima Annual Noise - Met Conditions
10 to 26 September 2019**

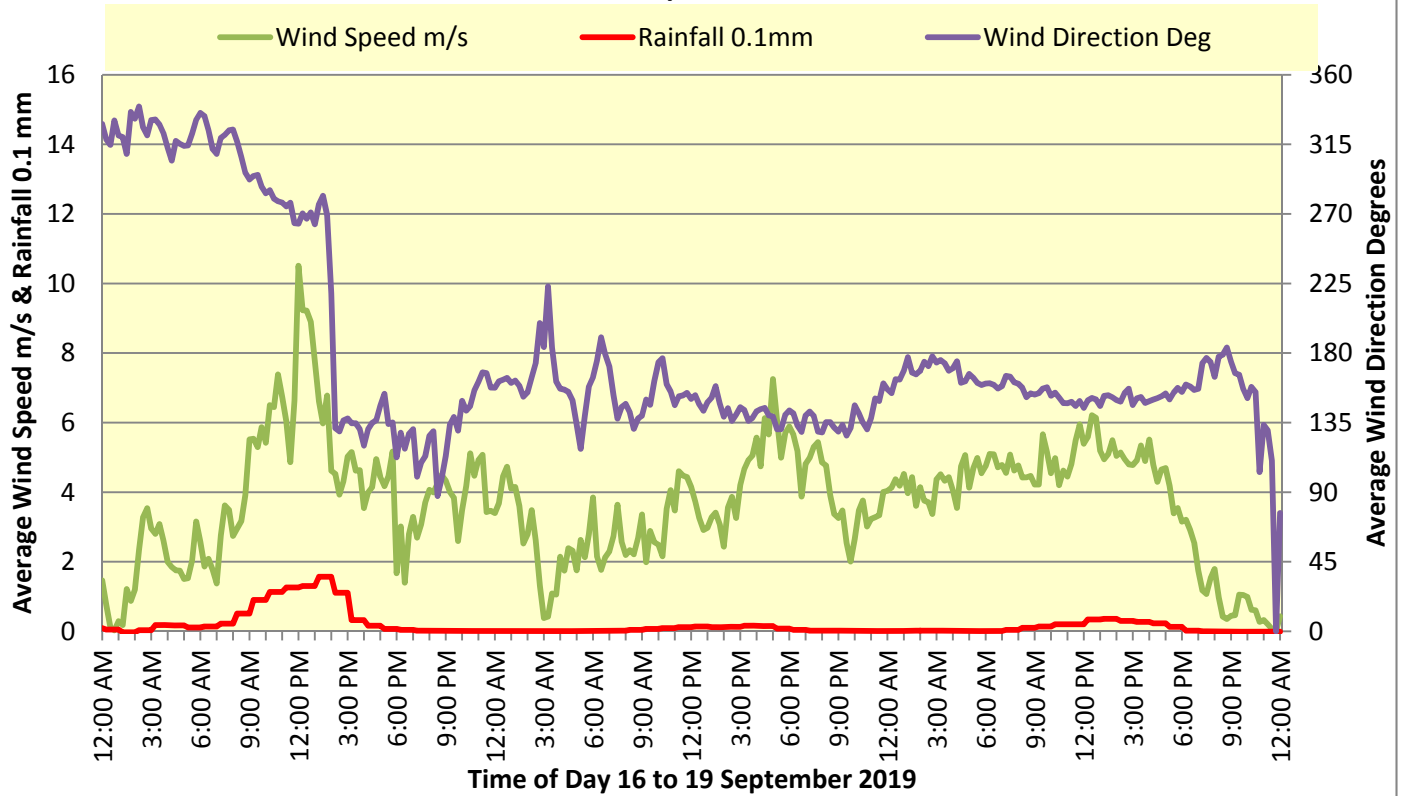


**Figure 4.8: Boral Cement Berrima Annual Noise - Met Conditions
10 to 26 September 2019**

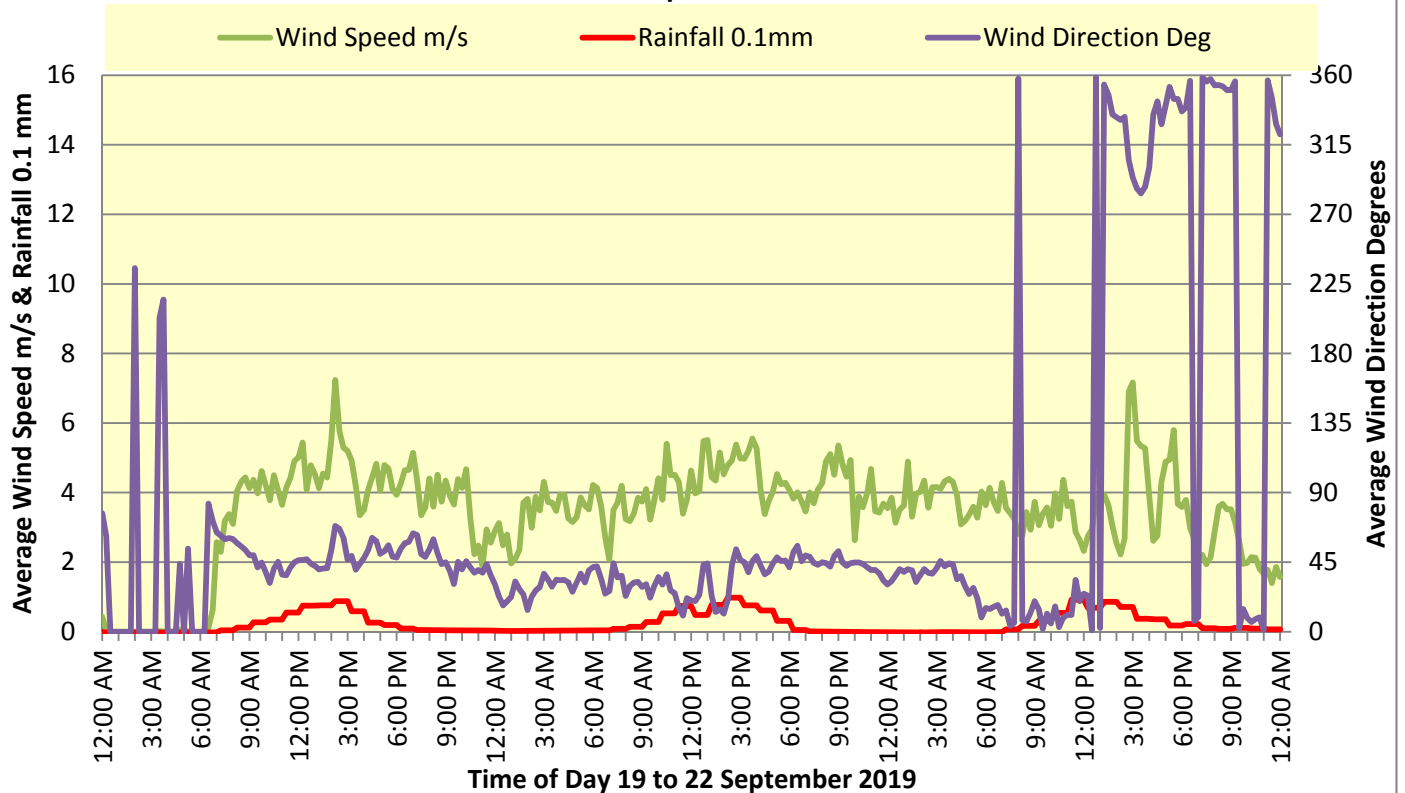


Figure 4.9: Boral Cement Berrima Annual Noise - Met Conditions 10 to 26 September 2019

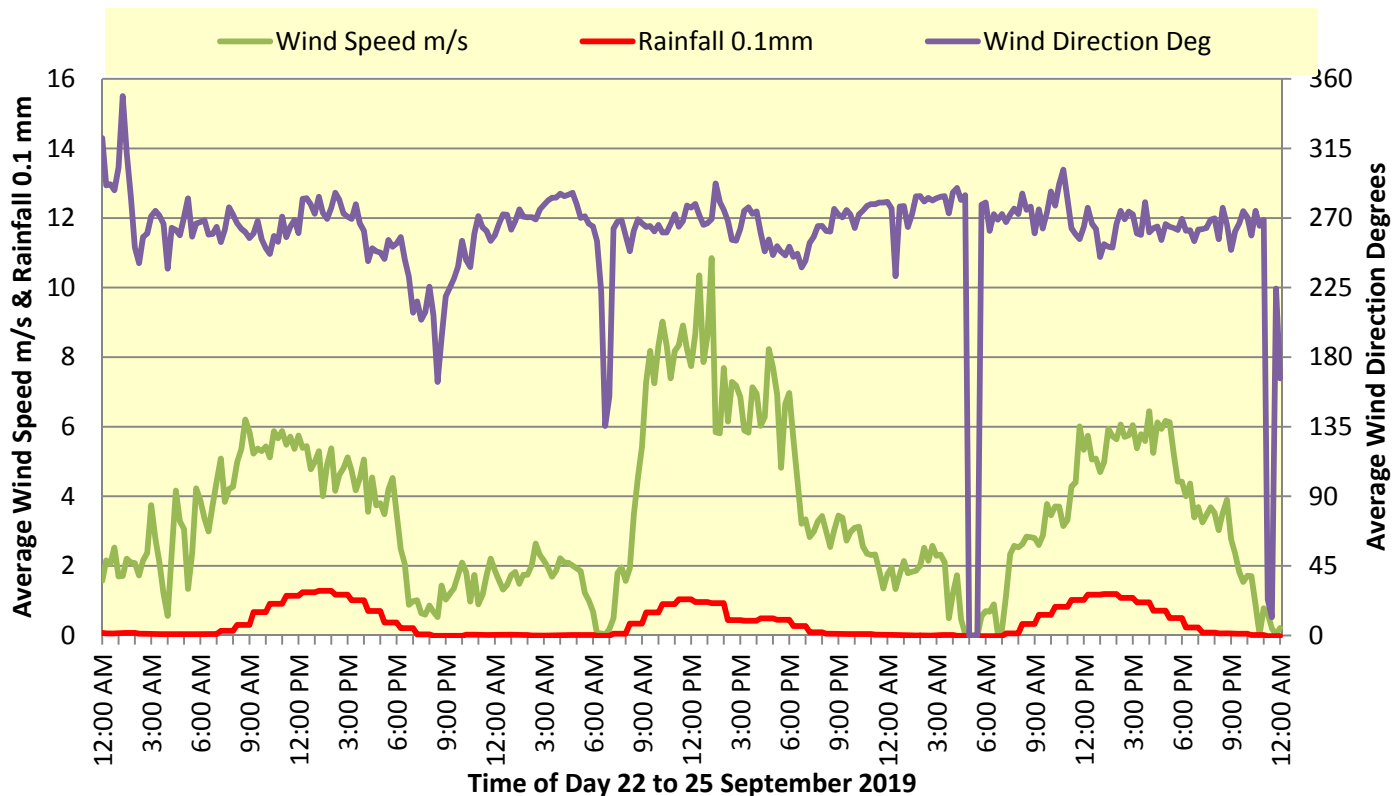


Figure 4.10: Boral Cement Berrima Annual Noise - Met Conditions 10 to 26 September 2019

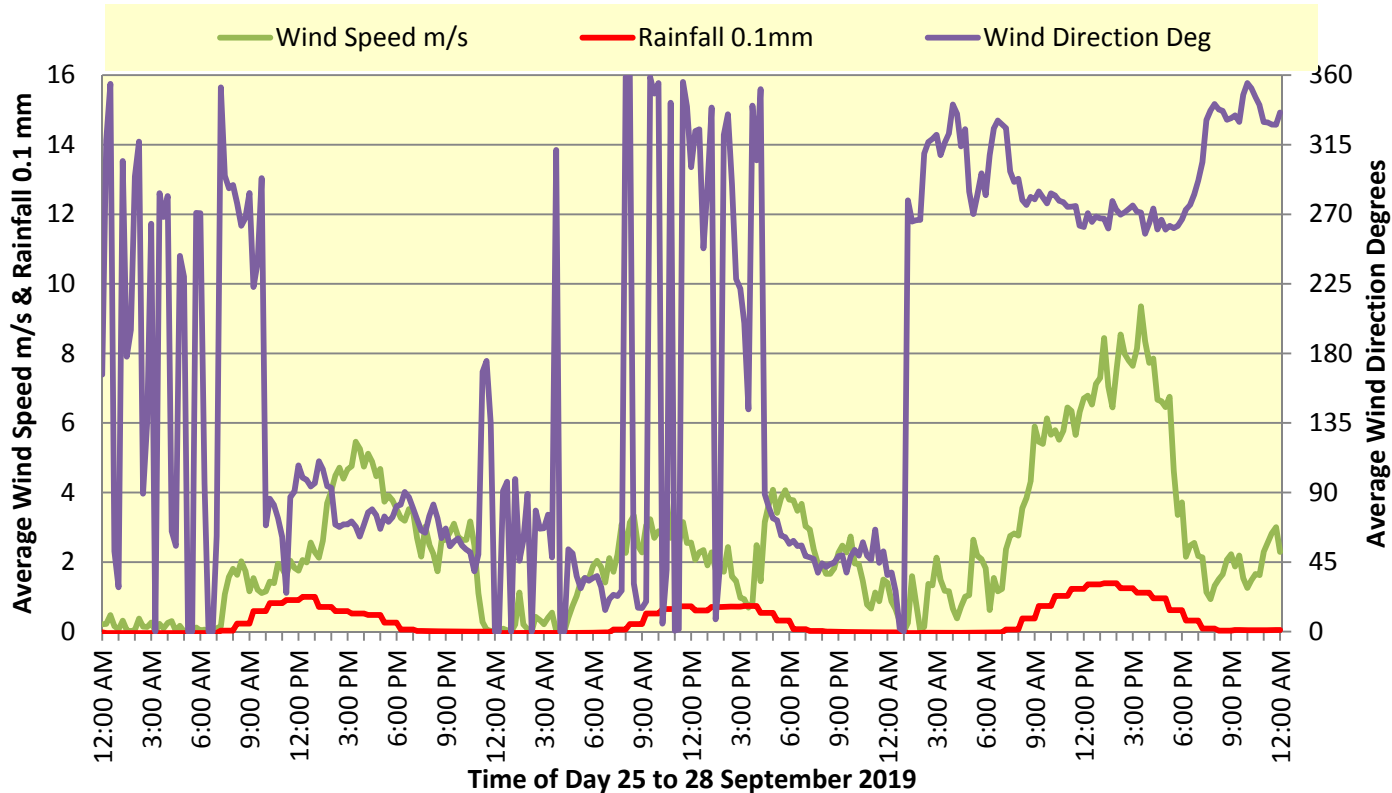


Table 4.1 : Boral Cement Berrima - 2019 Annual Environmental Noise Compliance - residential and boundary receiver locations
Comparison of Period L_{AEQ} , Period Average L_{A90} and Period 90% L_{A90} Results

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. $L_{AEQ,24hr}$
4 Melbourne St, New Berrima NSW	60	50	53	52	43	48	52	43	47	57	48	51
12 Brisbane St. New Berrima NSW	58	51	54	57	46	51	56	43	49	56	50	52
72 Taylor Ave, New Berrima NSW	64	56	60	58	51	54	59	49	54	61	53	58
30 Adelaide St. New Berrima NSW	59	48	51	50	43	47	51	41	46	56	46	49
Northern Fence, Boral Cement	57	48	51	56	47	51	56	47	51	56	48	51
Store Yard Close, Boral Cement	67	58	62	63	55	59	63	53	57	64	56	60

$L_{90.15-min\ 10\%}$	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 $L_{A90,Night}$
4 Melbourne St, New Berrima NSW	49	36	41	40	46	37	40	40	46	34	40	39
12 Brisbane St. New Berrima NSW	53	39	44	45	52	42	45	45	54	39	45	44
72 Taylor Ave, New Berrima NSW	54	43	46	45	52	42	45	45	54	39	45	44
30 Adelaide St. New Berrima NSW	48	37	42	40	47	36	41	40	47	33	40	40
Northern Fence, Boral Cement	54	42	46	45	53	43	47	46	53	40	47	46
Store Yard Close, Boral Cement	53	50	51	51	53	50	51	51	53	50	52	52

$L_{90.15-min}$	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 $L_{A90,Night}$
4 Melbourne St, New Berrima NSW	50	38	43	42	48	38	42	41	48	36	42	41
12 Brisbane St. New Berrima NSW	53	42	46	45	53	40	46	45	52	38	45	44
72 Taylor Ave, New Berrima NSW	55	45	48	47	54	42	47	46	55	41	47	46
30 Adelaide St. New Berrima NSW	49	41	44	43	48	38	43	42	48	35	43	43
Northern Fence, Boral Cement	54	43	48	47	54	44	48	47	54	43	49	48
Store Yard Close, Boral Cement	55	51	53	54	54	51	52	52	55	50	53	53

Difference Average L_{Aeq} - Median 10% L_{A90}	$L_{Aeq,period}$ - Median 10% $L_{A90,period}$ dB		
	Day	Evening	Night
4 Melbourne St, New Berrima NSW	13	8	8
12 Brisbane St. New Berrima NSW	9	6	5
72 Taylor Ave, New Berrima NSW	15	9	10
30 Adelaide St. New Berrima NSW	11	7	6
Northern Fence, Boral Cement	6	5	4
Store Yard Close, Boral Cement	11	8	5

Receiver Location 4 Melbourne Street

* Based on Suburban/Industrial Interface from NSW INP Table 2.1

continued

Ave L90 from attended
for Jun & Dec 2008

Receiver Location 72 Taylor Ave near Adelaide St

	Most Off	Most on	Most Off	Most on
Ave L90 from attended for Jun & Dec 2008				

Receiver Location 12 Brisbane Street

Most OffMost on

Receiver Location 4 Northern Boundary

Most Off	Most on	Most Off	Most on

Table 4.2: Boral Cement Berrima - 2018 Annual Environmental Noise Review:
Comparison of statistical sound levels 2002 to 2019
Receiver Location Store Yard Close from 2015

Parameter	Period	Survey Dates																								Statistics										
																										Jul-15	Apr-16	May-16	Jul-16	Sep-17	Jul-18	Nov-19	Max	Min	Ave	SD
LAEQ.ave	Day																									58		58	58	59	56	62	62	56	58	2.0
	Evening																									56		56	53	55	55	59	59	53	56	2.0
	Night																									57		56	53	57	55	57	57	53	56	1.5
LA90.ave	Day																									54		53	53	53	52	53	54	52	53	0.8
	Evening																									54		53	50	53	53	52	54	50	53	1.4
	Night																									54		53	50	54	53	53	54	50	53	1.4
10%LA90.ave	Day																									52		52	52	52	51	53	53	51	52	0.7
	Evening																									53		52	51	53	51	51	53	51	52	0.8
	Night																									51		52	51	53	52	52	53	51	52	0.7

Diff. Location to 2012

Receiver Location 30 Adelaide Street from 2018

Receiver Location 30 Adelaide Street from 2018

Parameter	Period	Survey Dates																												Statistics				
																													Jul-18	Sep-19	Max	Min	Ave	SD
LAEQ.ave	Day																												57	51	57	51	54	4.5
	Evening																												49	47	49	47	48	1.2
	Night																													47	46	47	46	47
LA90.ave	Day																												44	44	44	44	44	0.0
	Evening																												43	43	43	43	43	0.4
	Night																													44	43	44	43	43
10%LA90.ave	Day																												40	40	40	40	40	0.2
	Evening																												42	40	42	40	41	1.8
	Night																													42	40	42	40	41

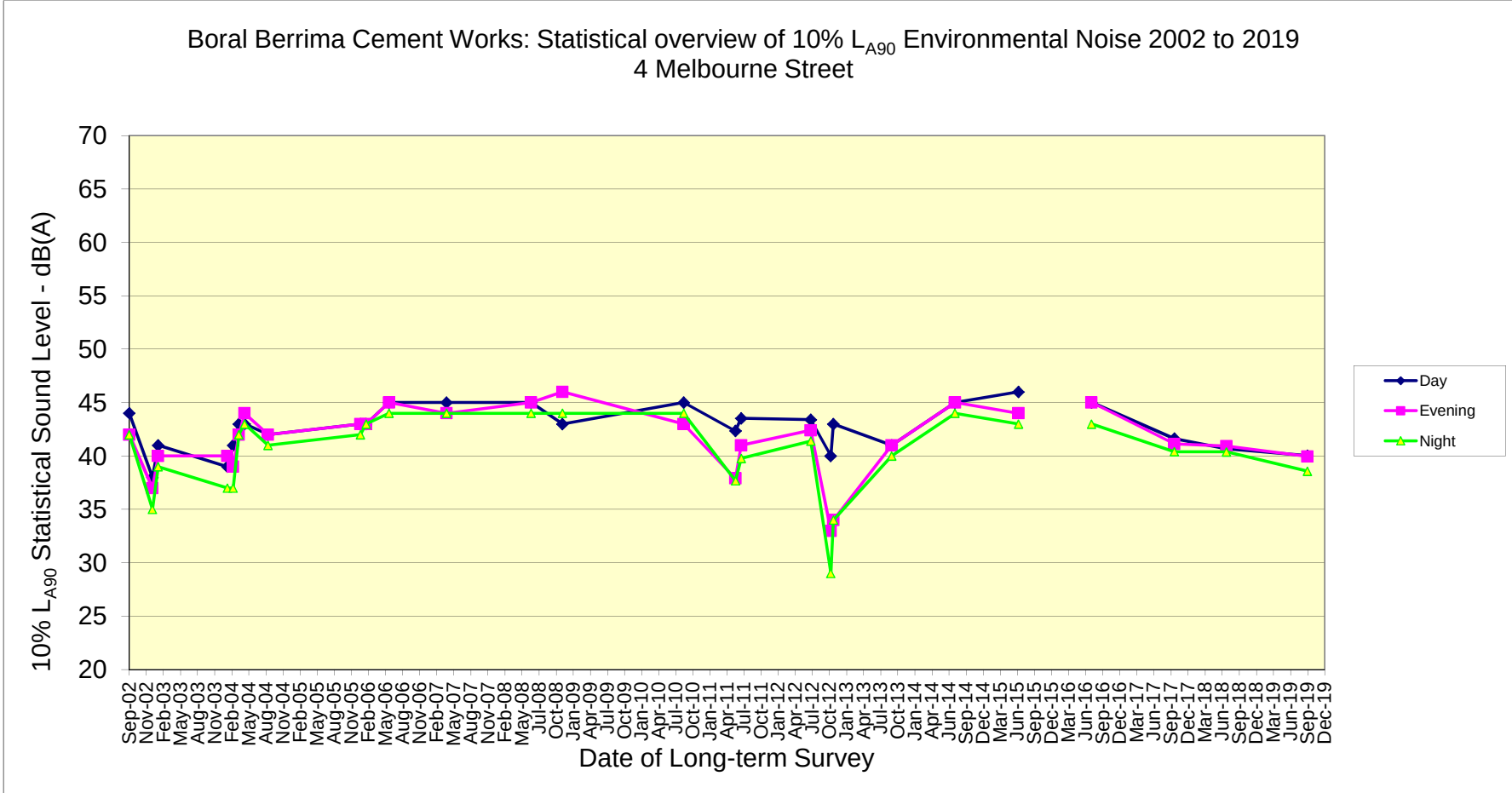
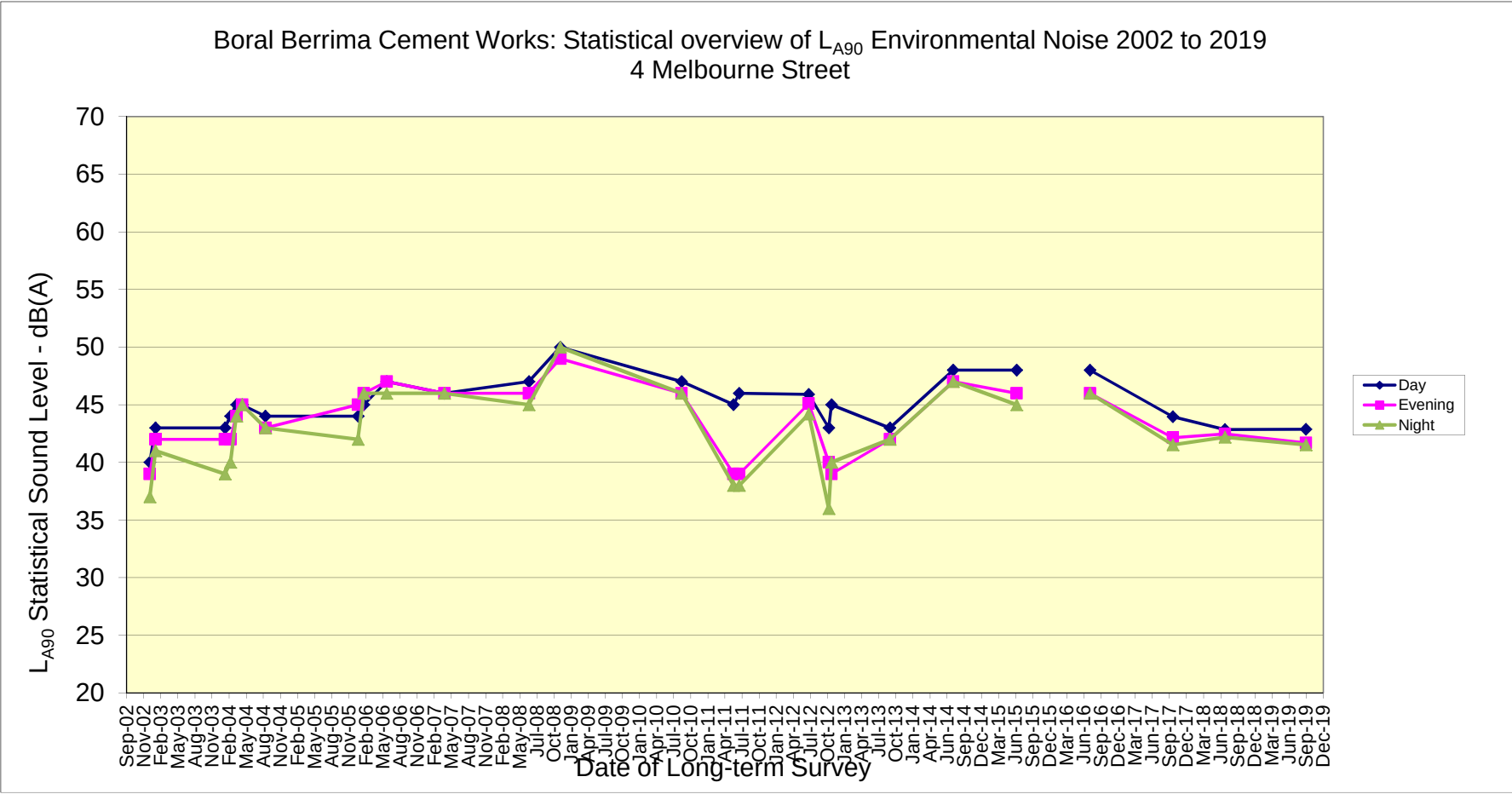
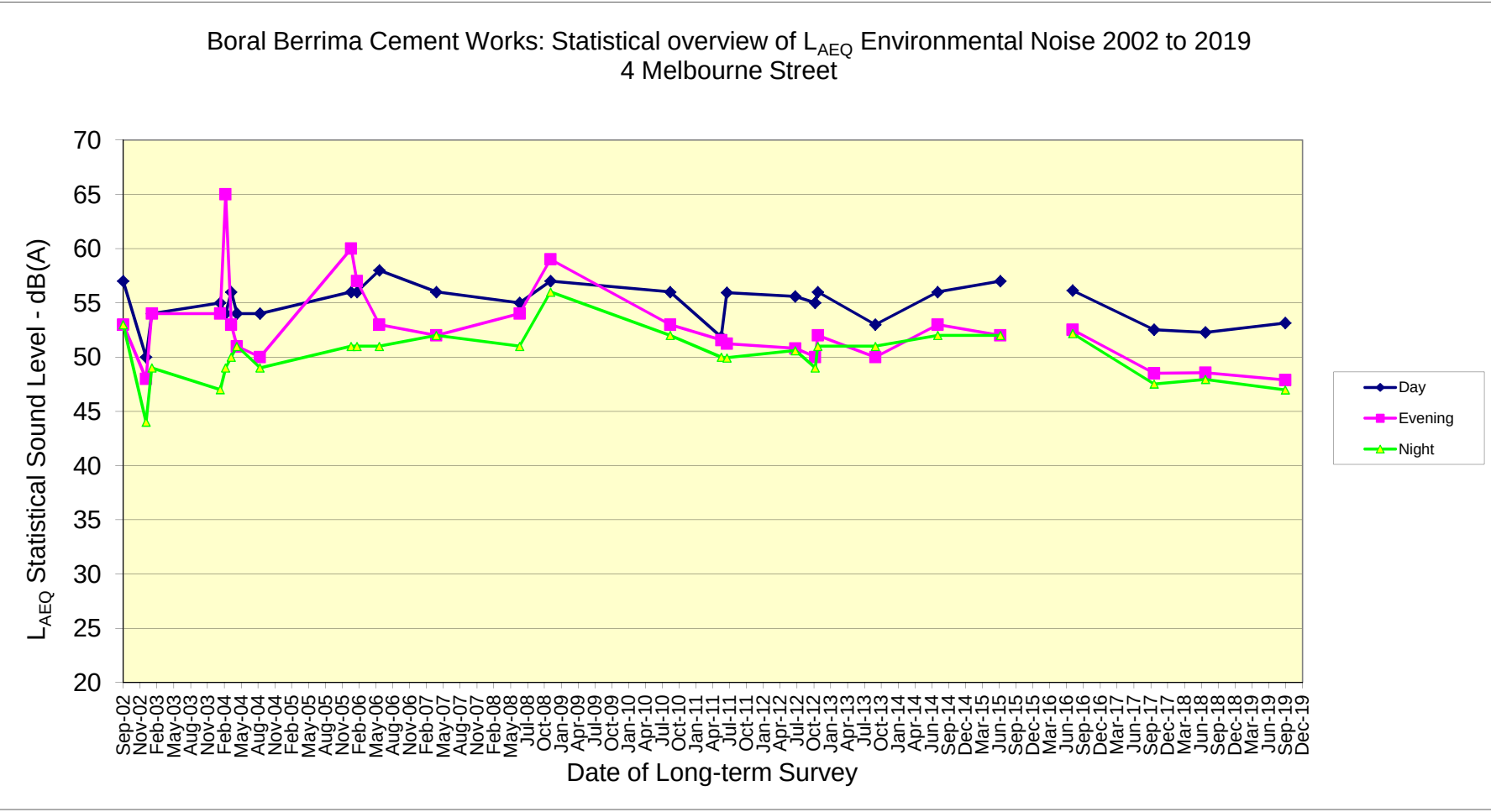


Figure 4.11: Comparison of statistical sound levels for 4 Melbourne Street location

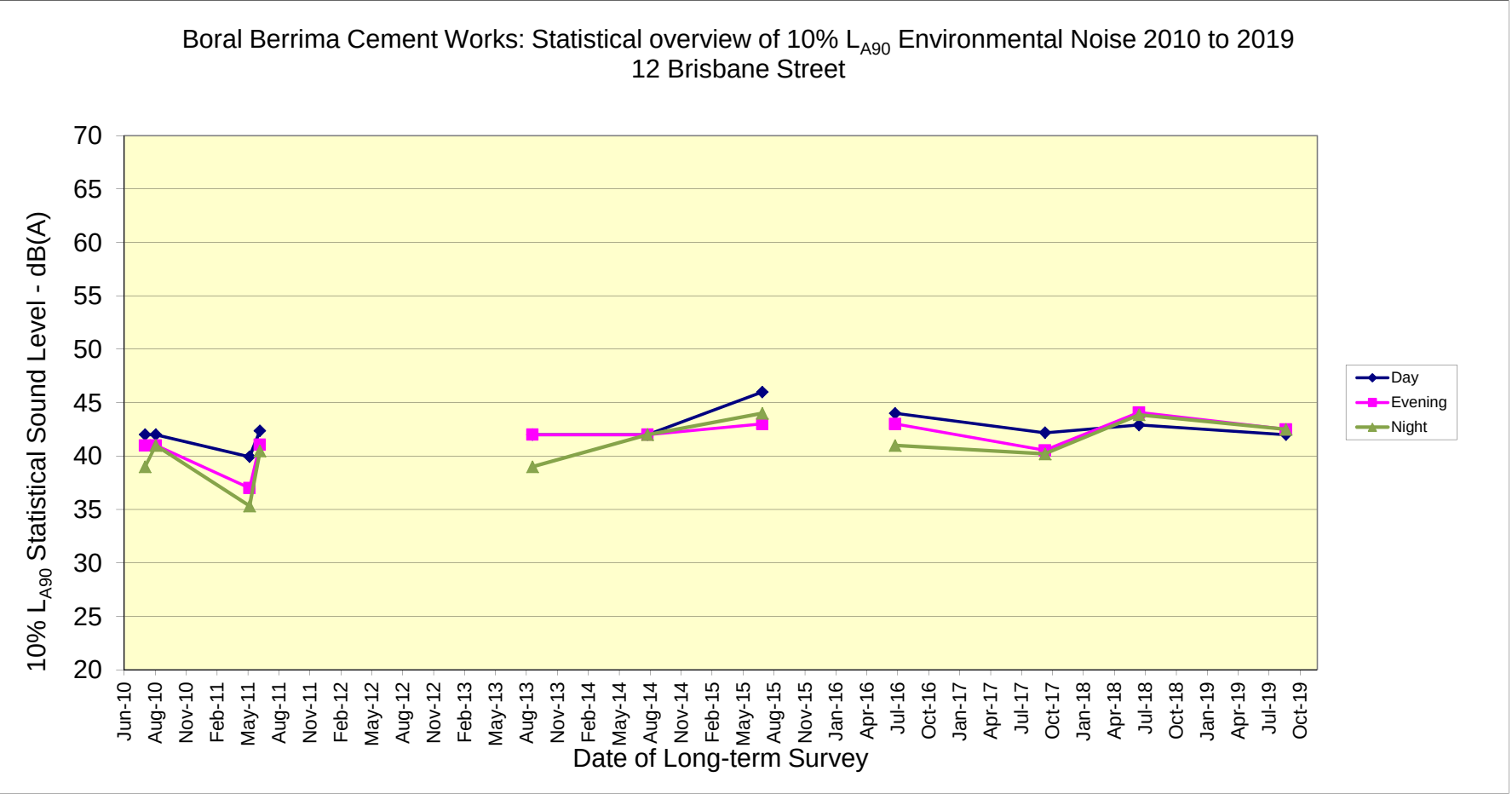
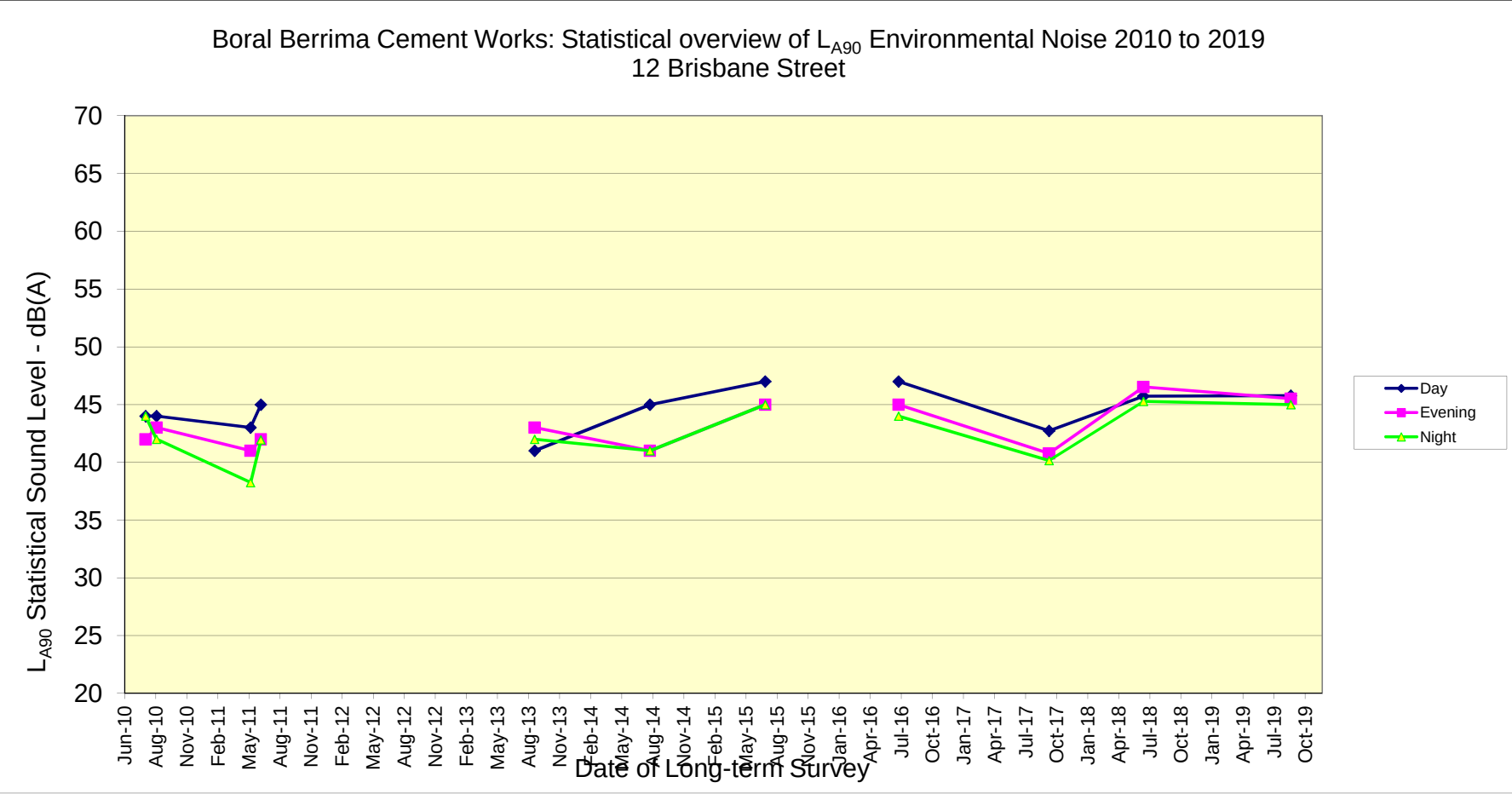
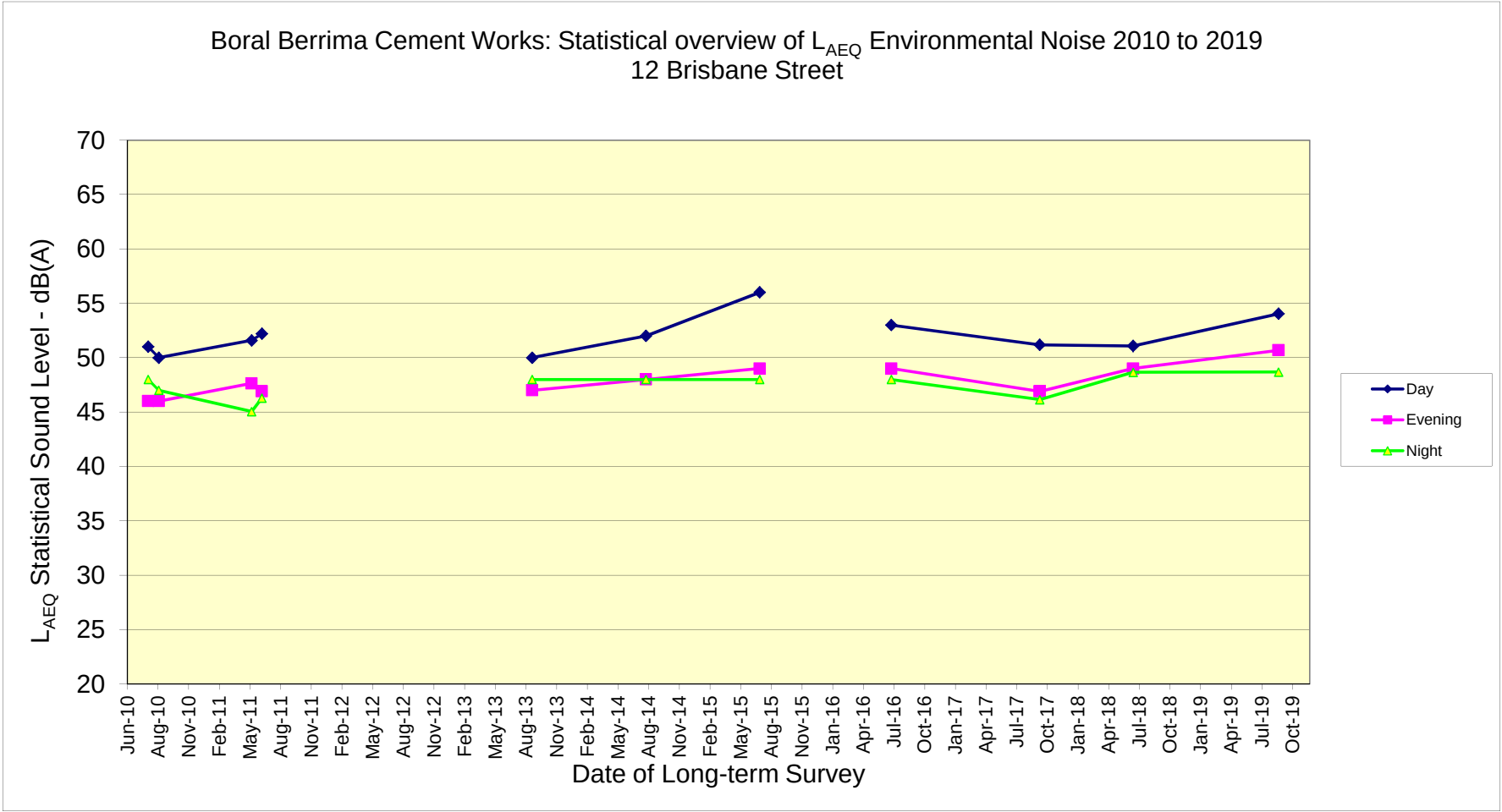


Figure 4.13: Comparison of statistical sound levels for 12 Brisbane Street location

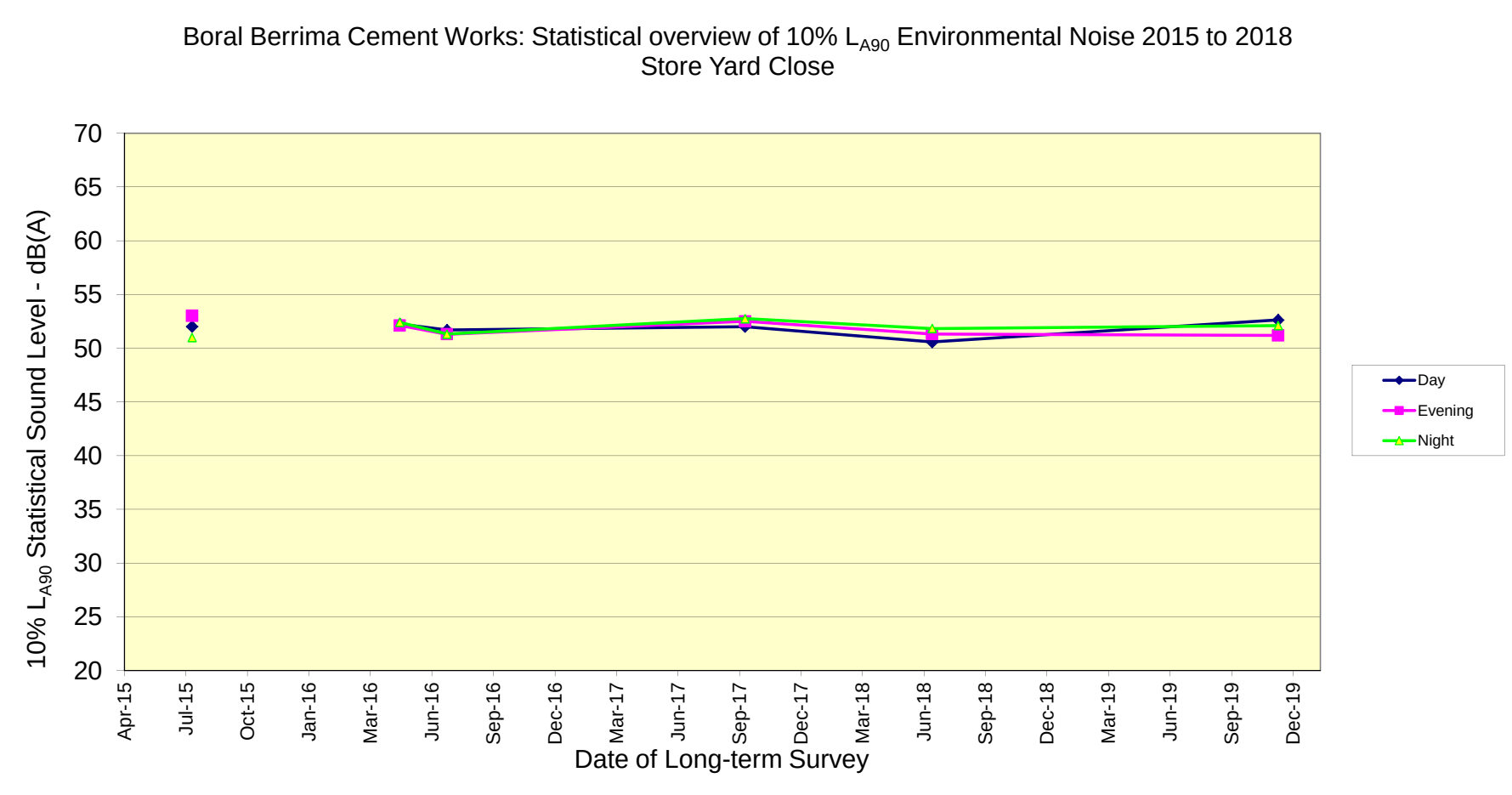
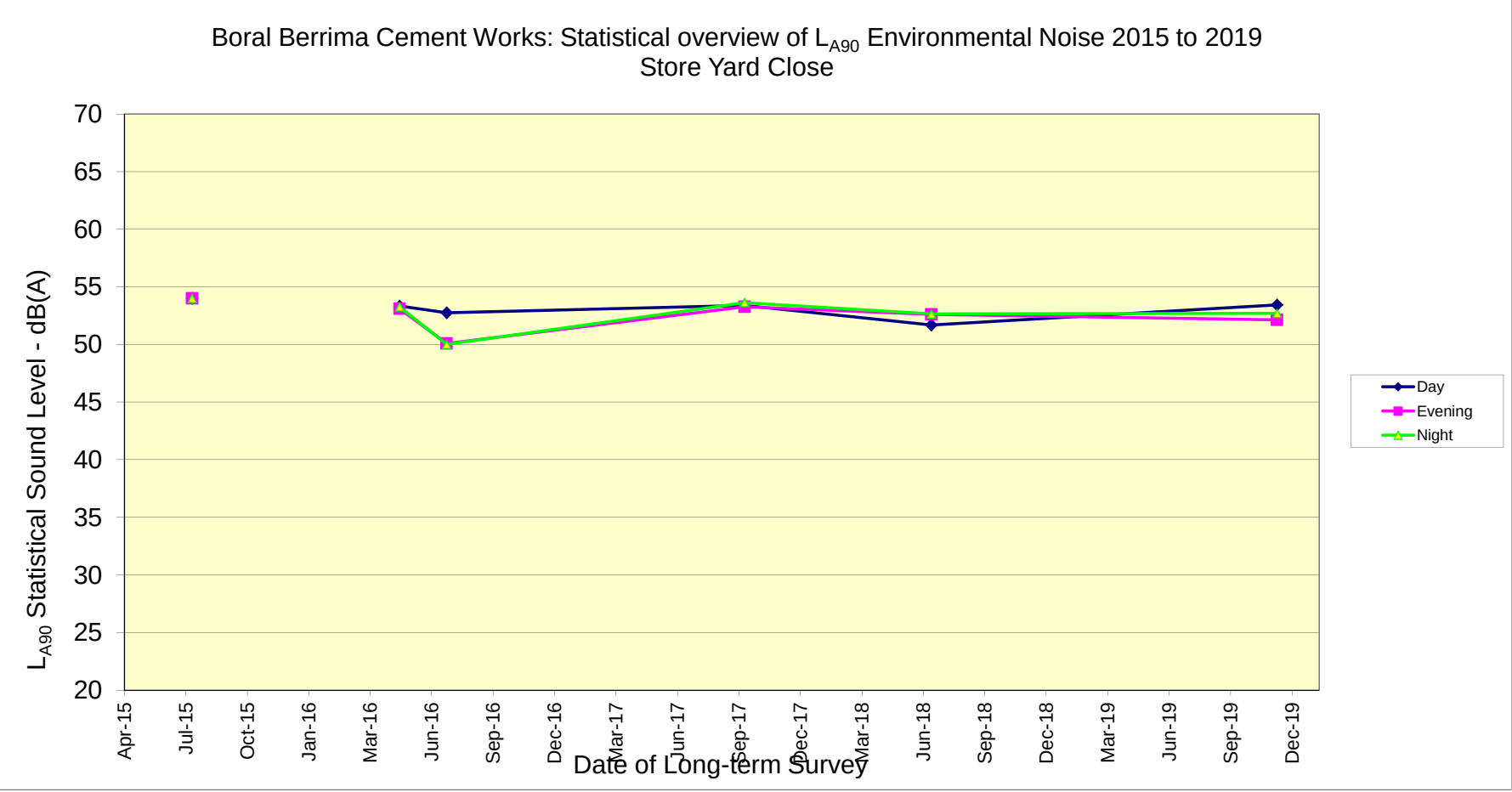
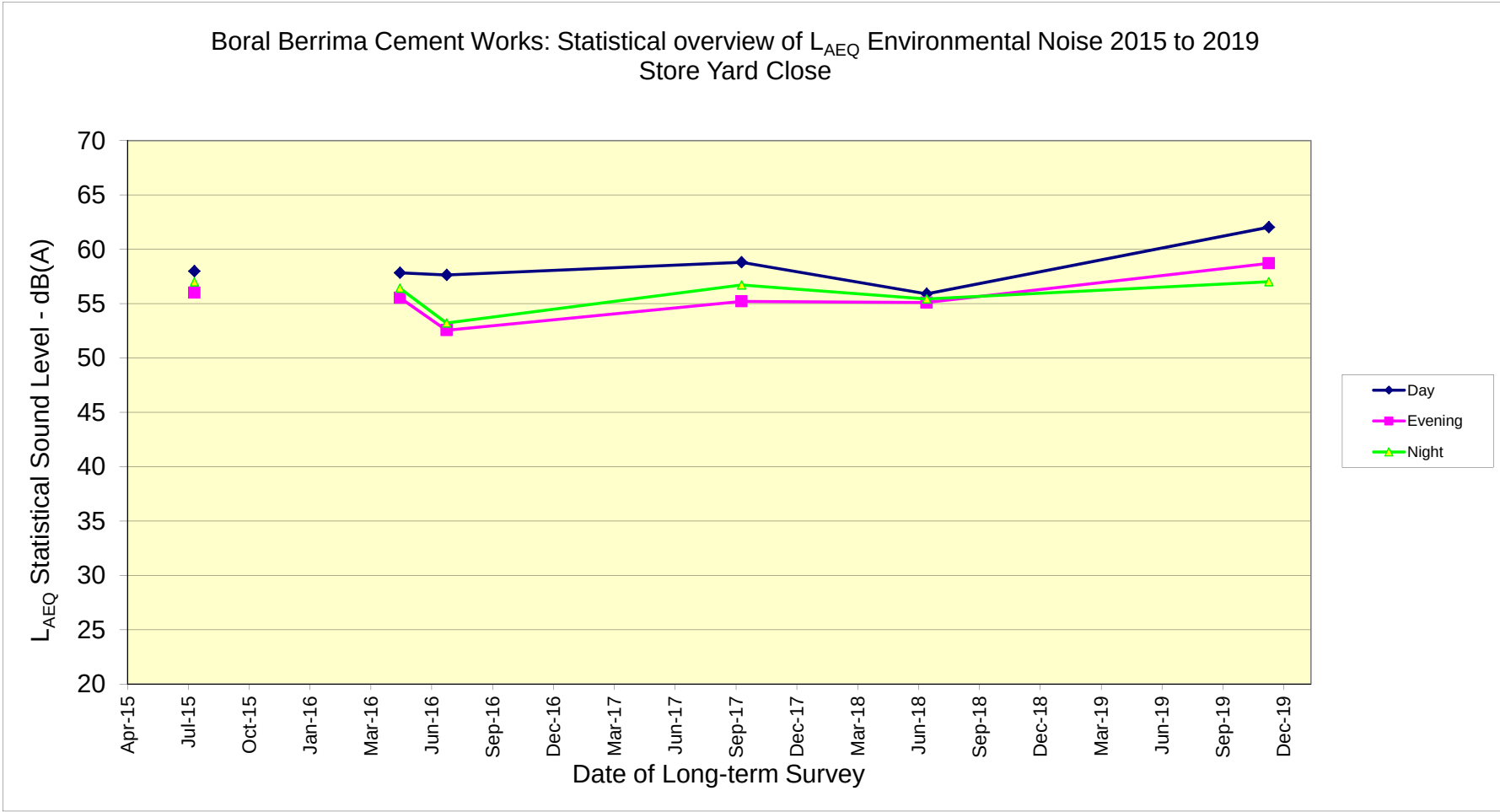


Figure 4.15: Comparison of statistical sound levels for Store Yard Close location

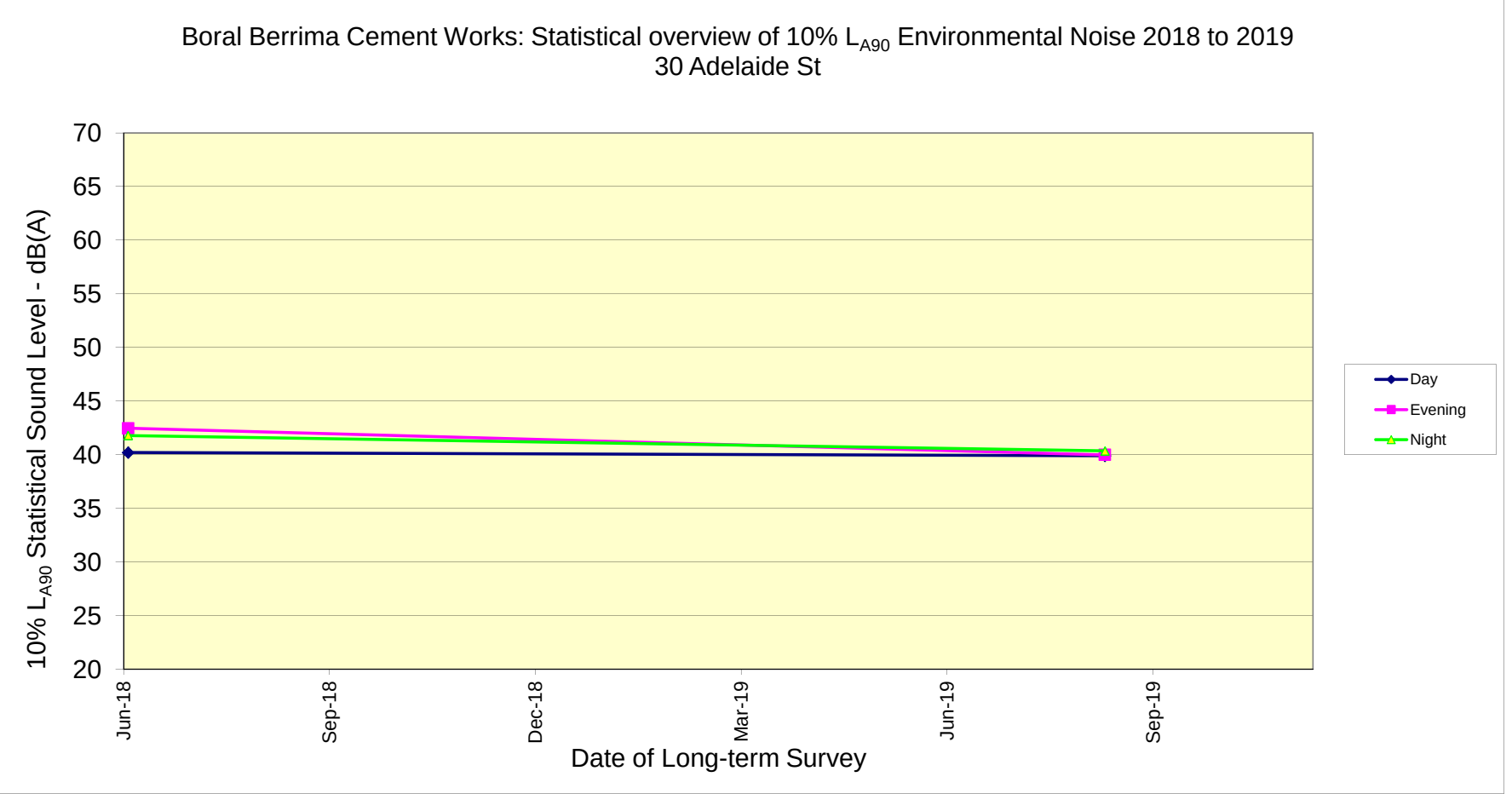
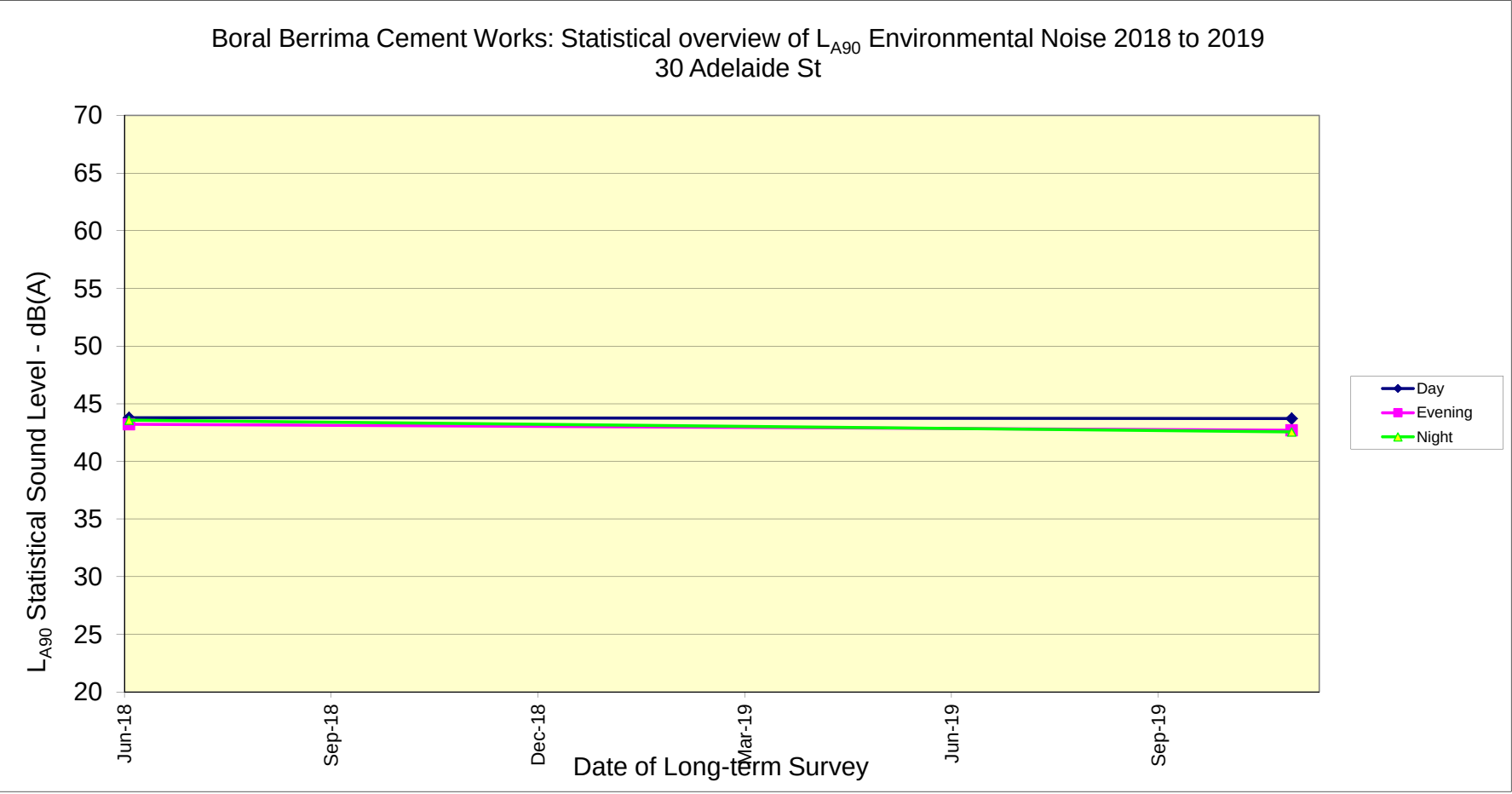
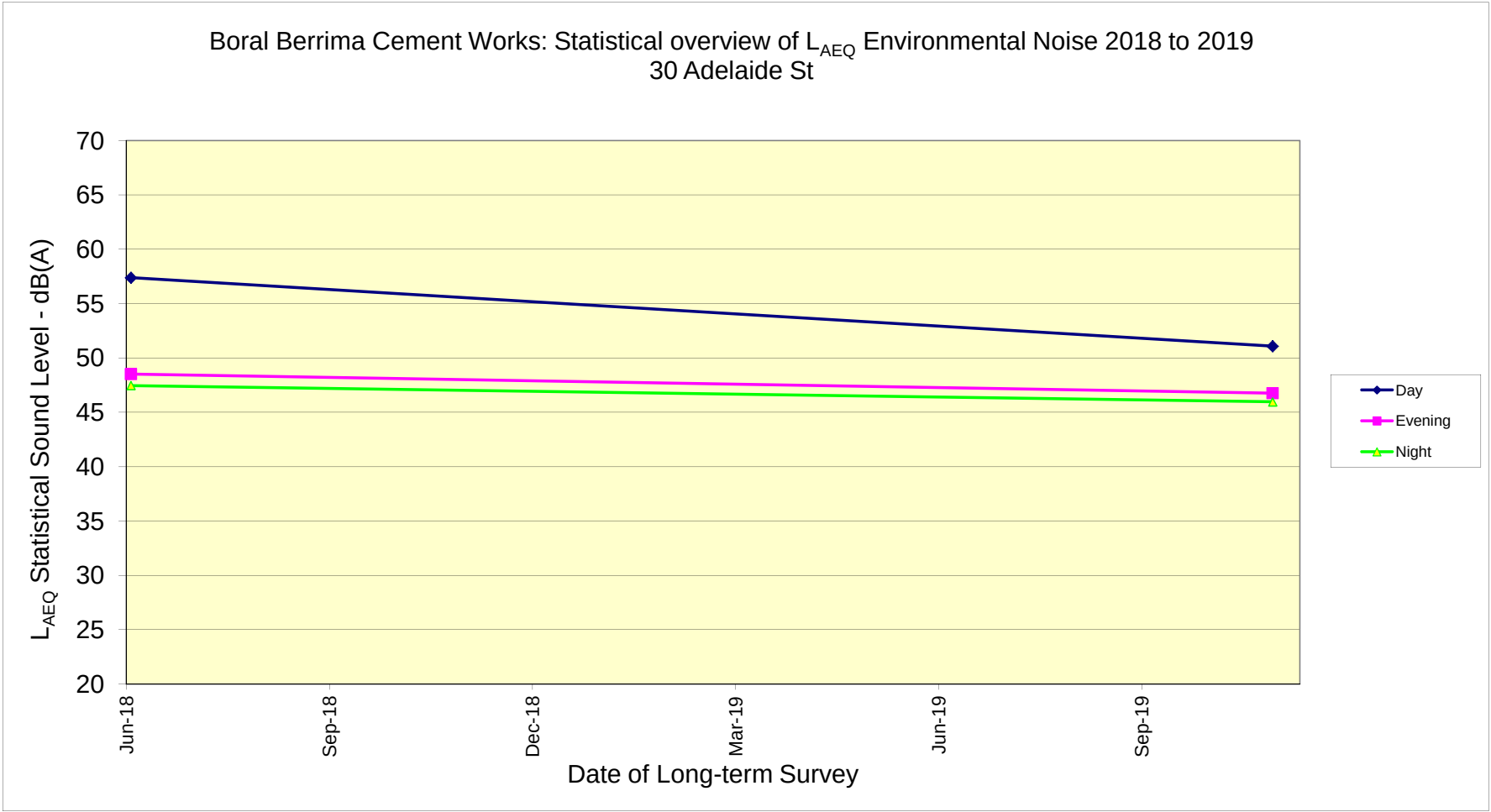


Figure 4.16: Comparison of statistical sound levels for 30 Adelaide St location

4.2 Store Yard Close location results compared to recommendations

4.2.1 $L_{A90,period}$ sound levels

The recommended PRP objectives for the Store Yard Close location are a long-term average $L_{A90,period}$ not greater than 56 dBA or 58 dBA for any period. For the 14 days of measurements the highest 15-minute period value for $L_{A90,15-min}$ was 59 dBA, which is the same as in 2018. This occurred on 8 November when the wind speed was close to 10m/s and general environmental noise was likely to be high. All other day, evening or night periods which had no period $L_{A90,15-min}$ greater than 57 dBA. The highest period average on any day was 55 dBA and the average over the 14 day period was 53 dBA daytime and night-time and 52 dBA evening. Table 4.3 below shows the statistics for the $L_{A90,15minute}$ period values and Figure 4.17 to 4.22 show graphs of these results.

Of the 1165 periods measured with wind speeds less than 10m/s and no rainfall events, one 15-minute period or 0.1% of the total number had $L_{A90,15-minute}$ sound levels greater than the recommended maximum for any period of 58 dBA.

Weather conditions during the measurement period for the Store Yard Close location included extended periods of high wind speeds, mostly westerlies. Figures 4.23 to 4.25 show a summary of the weather conditions for the period 6 to 19 November. Rain for extended periods did not occur during the period. Wind speeds exceeded 10m/s for 6% of the period and 5m/s for 51% of the period. There were only 6% of periods with calm wind conditions.

Table 4.3: Boral Cement Berrima - Store Yard Close Location
Statistics for individual $L_{A90,15-minute}$ data periods for 2019 measurements

Statistic		Number of 15-minute periods at or greater than			
% Exceedance	dBA	dBA	No. >	% of Total	No. at dB
Maximum 0	59	60	0	0.0%	0
0.5	56.2	59	0	0.0%	1
1.0	55.9	58	1	0.1%	0
2.0	55.6	57	7	0.6%	6
3.0	55.5	56	17	1.5%	10
4.0	55.5	55	101	8.7%	84
5.0	55.4	54	253	21.7%	152
7.5	55.1	53	523	44.9%	270
10.0	54.8	52	815	70.0%	292
15.0	54.4	51	975	83.7%	160
20.0	54.1	50	1126	96.7%	151
25.0	53.8	49	1165	100.0%	39

30.0	53.6				
35.0	53.3				
40.0	53.1				
45.0	52.9				
50.0	52.7				
55.0	52.5				
60.0	52.3				
65.0	52.0				
70.0	51.6				
75.0	51.4				
80.0	51.0				
82.5	50.9				
85.0	50.8				
90.0	50.5				
95.0	50.1				
96.0	50.0				
97.0	49.9				
98.0	49.8				
99.0	49.6				
Minimum 100.0	49				

The results in Table 4.3 are similar to or lower than those of 2018, when the maximum 15-minute interval sound level was also 59 dBA. In 2019 the number of intervals greater than 56 dBA was 1.5% and the number of intervals greater than 58 dBA was 0.1%.

**Figure 4.17: Boral Cement Berrima Annual Noise 2019 -
Store Yard Close $L_{A90,15-min}$ Statistics**

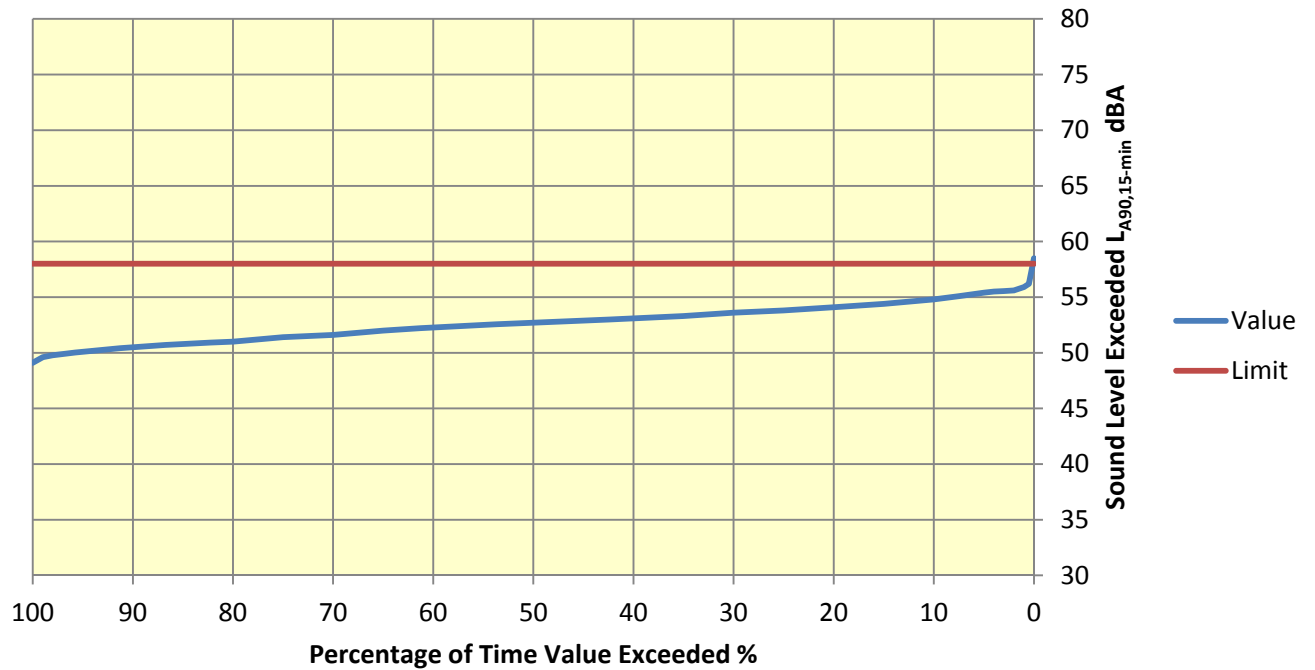


**Figure 4.18: Boral Cement Berrima Annual Noise 2019 -
Store Yard Close $L_{A90,15-min}$ Statistics**

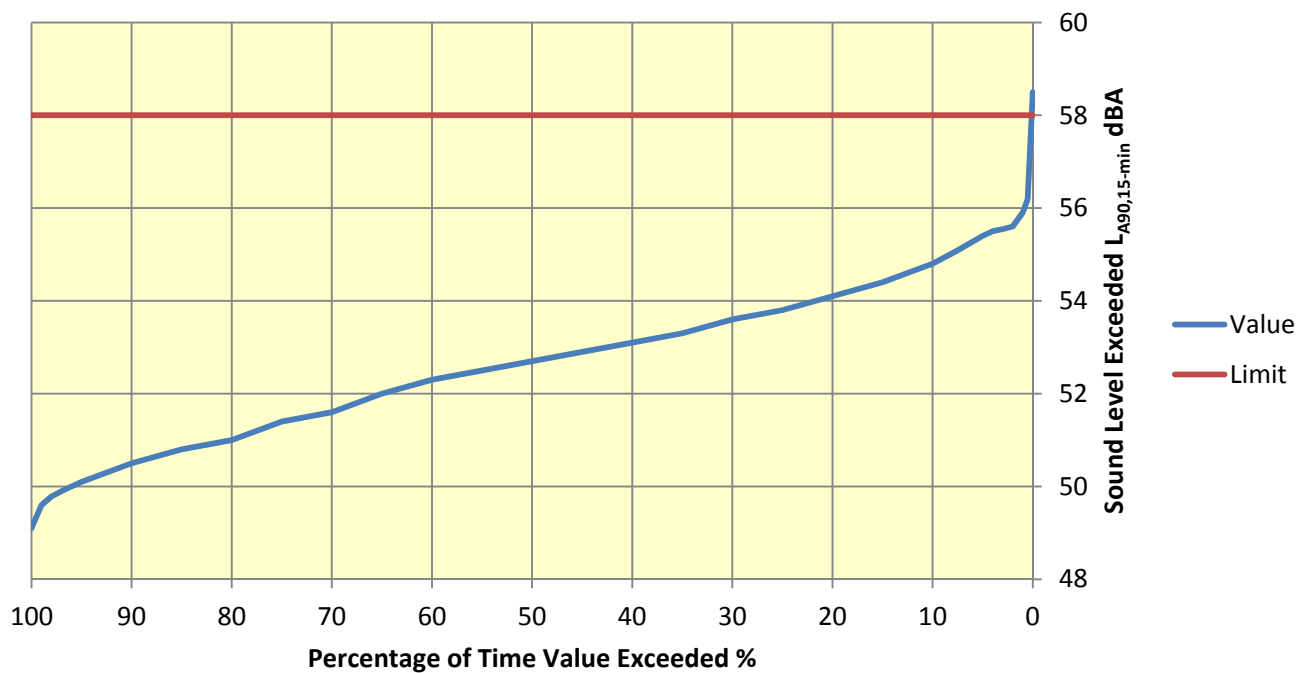


**Figure 4.19: Boral Cement Berrima Annual Noise 2019 -
Store Yard Close $L_{A90,15\text{-min}}$ Statistics**

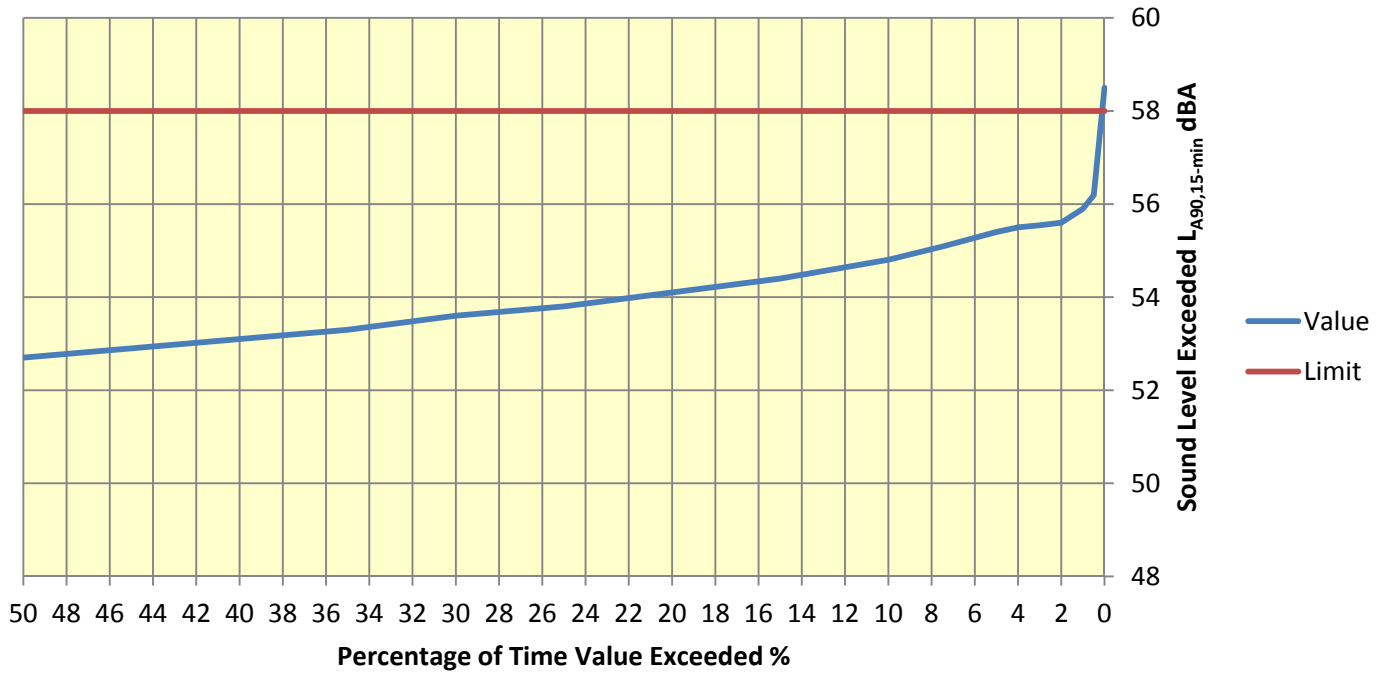


**Figure 4.20: Boral Cement Berrima Annual Noise 2019 -
Store Yard Close $L_{A90,15\text{-min}}$ Statistics**

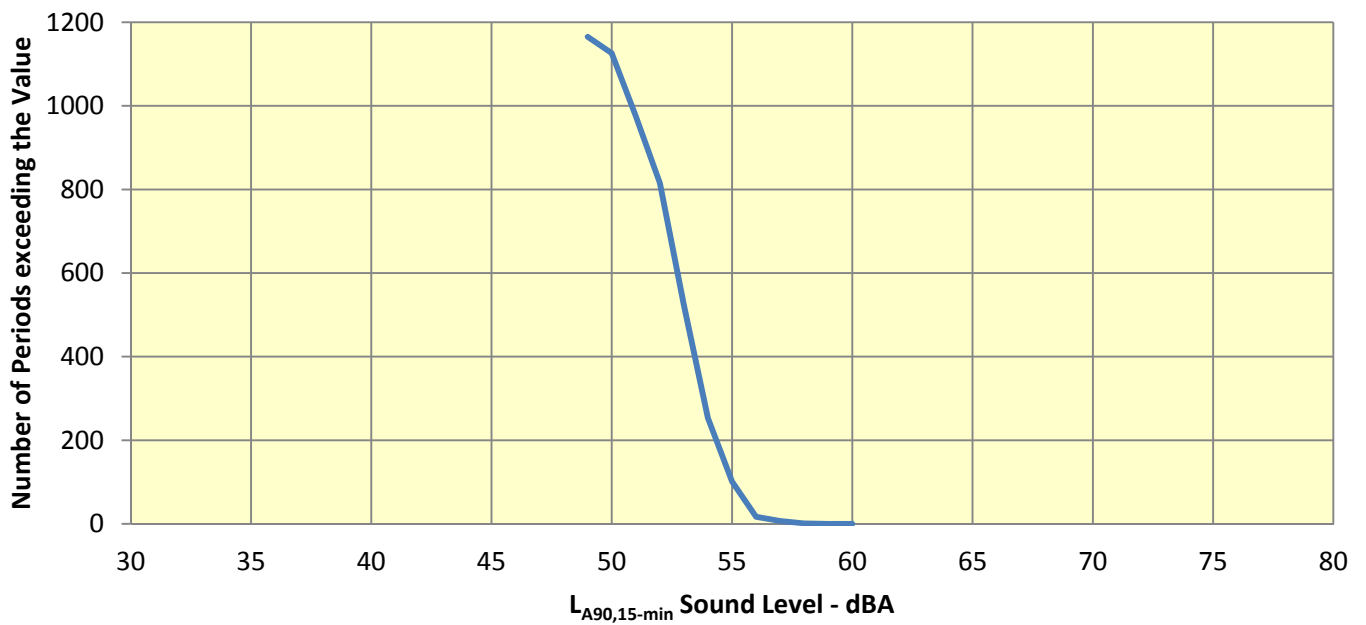


**Figure 4.20: Boral Cement Berrima Annual Noise 2019 -
Store Yard Close $L_{A90,15\text{-min}}$ Statistics**

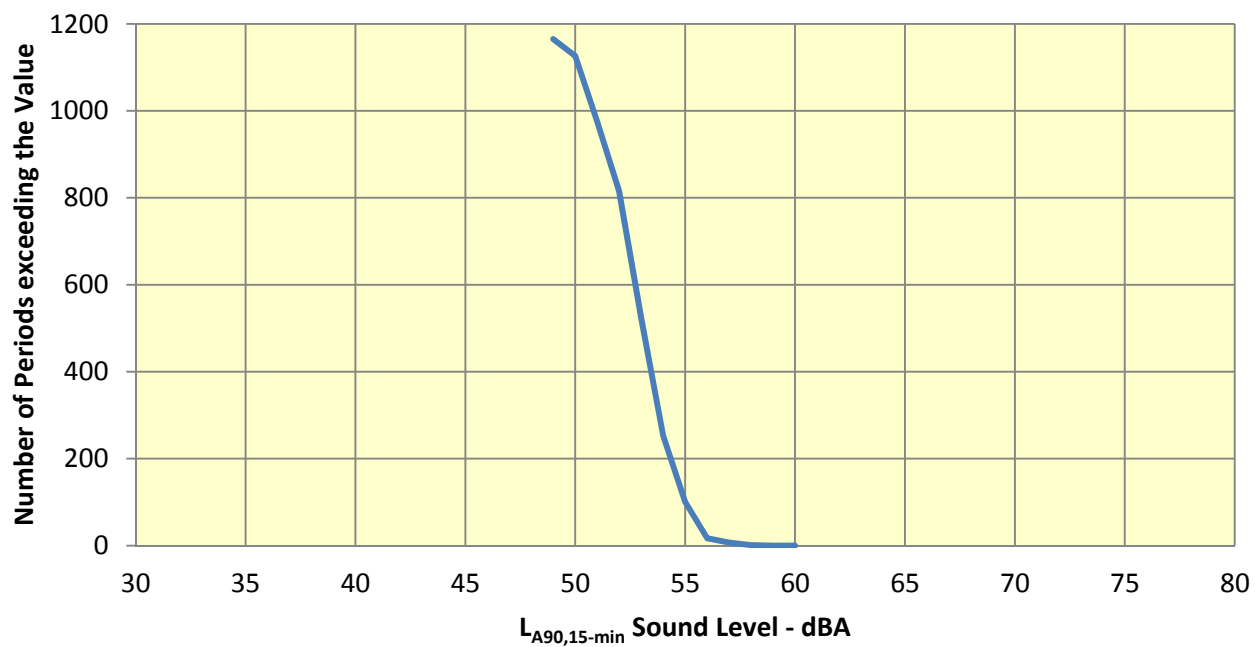


**Figure 4.21: Boral Cement Berrima Annual Noise 2019 -
Store Yard Close $L_{A90,15\text{-min}}$ Statistics**

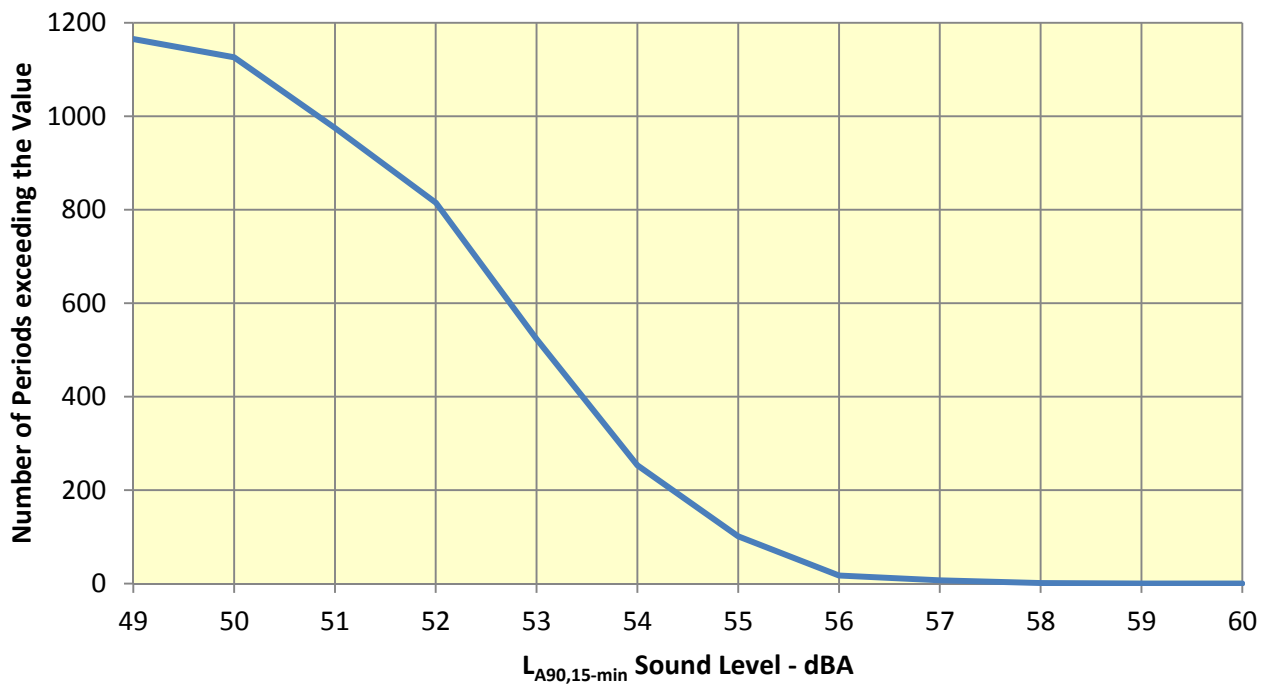
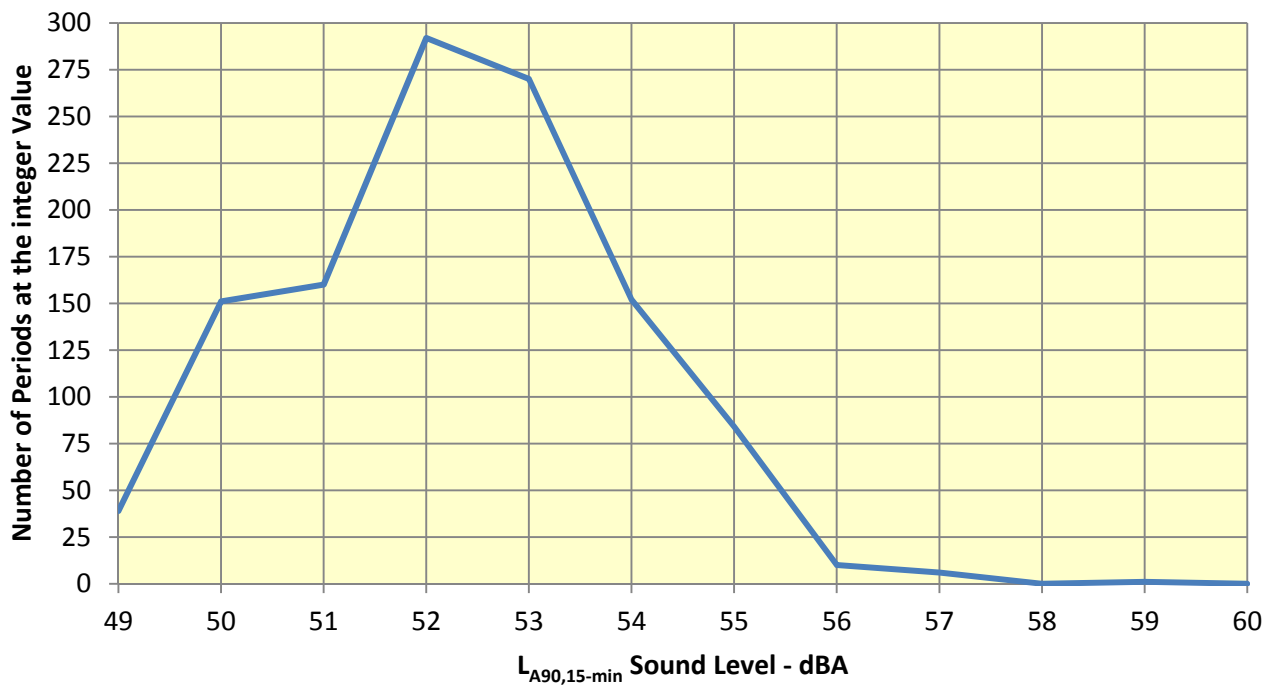


**Figure 4.22: Boral Cement Berrima Annual Noise 2019 -
Store Yard Close $L_{A90,15\text{-min}}$ Statistics**



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

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. 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 analyses were made for the Northern Boundary location showed for this location, 40 events exceeded the objective of 15 dB. 27 of these periods with $L_{A01.1\text{-minute}} - L_{A90.15\text{-minute}}$ difference results greater than 15 dB were listened to determine sources of noise occurring in the period – these periods were assumed to be typical of the events in adjoining or near-in-time periods.

Of the 40 events identified with a difference of greater than 15 dB at night-time, 3 had a difference of greater than 20 dB and 1 were greater than 25 dB. The maximum difference was 27 dB.

Figure 4.25 is a graph showing the times of events with the $L_{A01.1\text{-minute}} - L_{A90.15\text{-minute}}$ difference results greater than 15 dB for each night of the whole survey. On some nights the events occurred in one particular period, such as just before and until after dawn, on other nights there were some events also prior to midnight and other nights where the noise occurred several times.

The approach to listening to the events to determine the sources of noise was to listen to a representative sample for the monitoring period. The sampling was determined on the time sequence and difference level, for example if there was a run of events one period following directly after each other the period with the highest difference was investigated. This totalled 116 events from the sample set. This identified that heavy vehicles which had a whining gearbox were the source of the high sound levels on 27 of the 116 occasions. Other sources identified were trucks travelling over potholes in the road on 19 occasions, trucks passing 22 occasions, impacts and thumps 14 occasions, rail wheel squeal on 11 occasions, birds, insects and animals 10 occasions, train activity on 5 occasions and rain, motor bikes, heavy vehicle activity, trains' brakes or pneumatics or locomotive horns on 2 occasions.

Table 4.4 shows the effect of the whining gearbox and truck with associated bumps noise and rail squeal that to the closest receiver at 4 Melbourne St, and assuming a conservative allowance for noise attenuation from the road in front of the stock yard to that receiver. Rail squeal attenuation was calculated from the distance about 5 dBA and the added attenuation from high frequency component assumed to be at 3000Hz of 3 dBA which is referenced by ISO 9613 Part 1

Table 4.4 The effect of the Noise sources to the closest receiver of 4 Melbourne St

Noise observed at North Fence	Ave L1.1min at North Fence dBA	Attenuation to 4 Melbourne St dBA	Approx L1.1min at 4 Melbourne St dBA	Ave L90 at 4 Melbourne St - Night Time dBA	Diff : L1.1min - L90	Criteria
Whining gearbox	59	8	51	42	9	15
Bump over road	70	8	62	42	20	15
Rail Squeal	63	8	55	42	13	15

Table 4.4 indicates the whining gearbox is still within the criteria at the receiver. Also indicated that rail squeal is still close to criteria limit. Being located at the North Fence Trucks can be heard from Taylor Ave as well as the Local road in front of the Stock Yard. It was observed in the attended monitoring at the stock yard location that a bump in the site road caused an occurrence of 72 dBA approx. to be recorded on the 10 September 2019, consequently this may be identify the source observed at the North Fence compared to Taylor Ave road conditions.

A comparison of the event sound levels received at the Northern Boundary indicated that the high levels of $L_{A01,1\text{-minute}}$ which measured were caused by birds, insects or animals, the highest of 72dBA. Rail squeal was noted to have $L_{A01,1\text{-minute}}$ sound levels of greater than 60 dBA at the Northern boundary.

From these analyses it is considered 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 greater than 15 dB are relatively low and the noise emissions from the Cement Plant have a low potential for sleep disturbance. Passing vehicles on Taylor Avenue have the potential to cause a higher difference from passing over bumps on the road surface.

4.2.3 Low frequency noise

The recently introduced NSW Noise Policy for Industry now 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 ($L_C - L_A$) 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. The values given 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. 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.

As the recommended assessment criteria for the North Fence monitoring location is $L_{A90,15\text{-minute}}$ period average sound levels to avoid the influence of passing vehicles, the assessment of low frequency noise has also been made using the $L_{90,15\text{-minute}}$ sound levels.

An analysis was made for 1479 15-minute period results from 10 September to 26 September. Of these, there were 1029 periods where $L_{Ceq,15-minutes} - L_{Aeq,15-minutes}$ exceeded 15 dB. For the $L_{90,15-minutes}$ measurements in evening and night-time (788 periods), there were 500 periods where the difference exceeded 15 dB. Analysis was made of the one-third octave band frequency values for these and 189 periods exceeded the values in Table 4.5 by more than 1 dB while 11 periods exceeded the criteria by more than 5. Table 4.5 shows the numbers and exceedances. The maximum exceedance of the criteria was 7 dB in the 40 Hz band.

Table 4.5: Exceedance of Noise Policy for Industry Low frequency criteria for evening and night-time at the Store Yard Close location

	One-third octave LZ90,15min threshold level dB and number exceeding threshold												
1/3rd Oct. Freq. Band Hz	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
Threshold Level – dBZ	92	89	86	77	69	61	54	50	50	48	48	46	44
No. Exceed by > 1 dB	0	0	0	0	0	0	151	189	10	48	1	0	11
No.by > 2 dB	0	0	0	0	0	0	68	84	1	23	0	0	6
No.by > 5 dB	0	0	0	0	0	0	5	11	0	1	0	0	0
No.by>10 dB	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum exceed dB	0	0	0	0	0	0	7	6	5	6	2	0	4

The analysis indicates that low-level exceedances of the criteria are mainly in the 80 to 160 Hz region, typically related to diesel truck noise which the North Fence gets exposure from Taylor Ave and the internal road. At higher exceedances, the 40 Hz band is the main source, with the 50Hz band also significant.

It is not known what the sources of these frequency band sounds are as there are none at the plant that have been measured with that frequency band dominant at a high level. They could be conveyors and their drives, kiln drives and similar low rpm items but these usually have a relatively low sound power level. Results of the site measurements will be reviewed to identify potential sources.

Figure 4.23: Boral Cement Berrima Annual Noise - Meteorological Data 6 to 19 November 2019

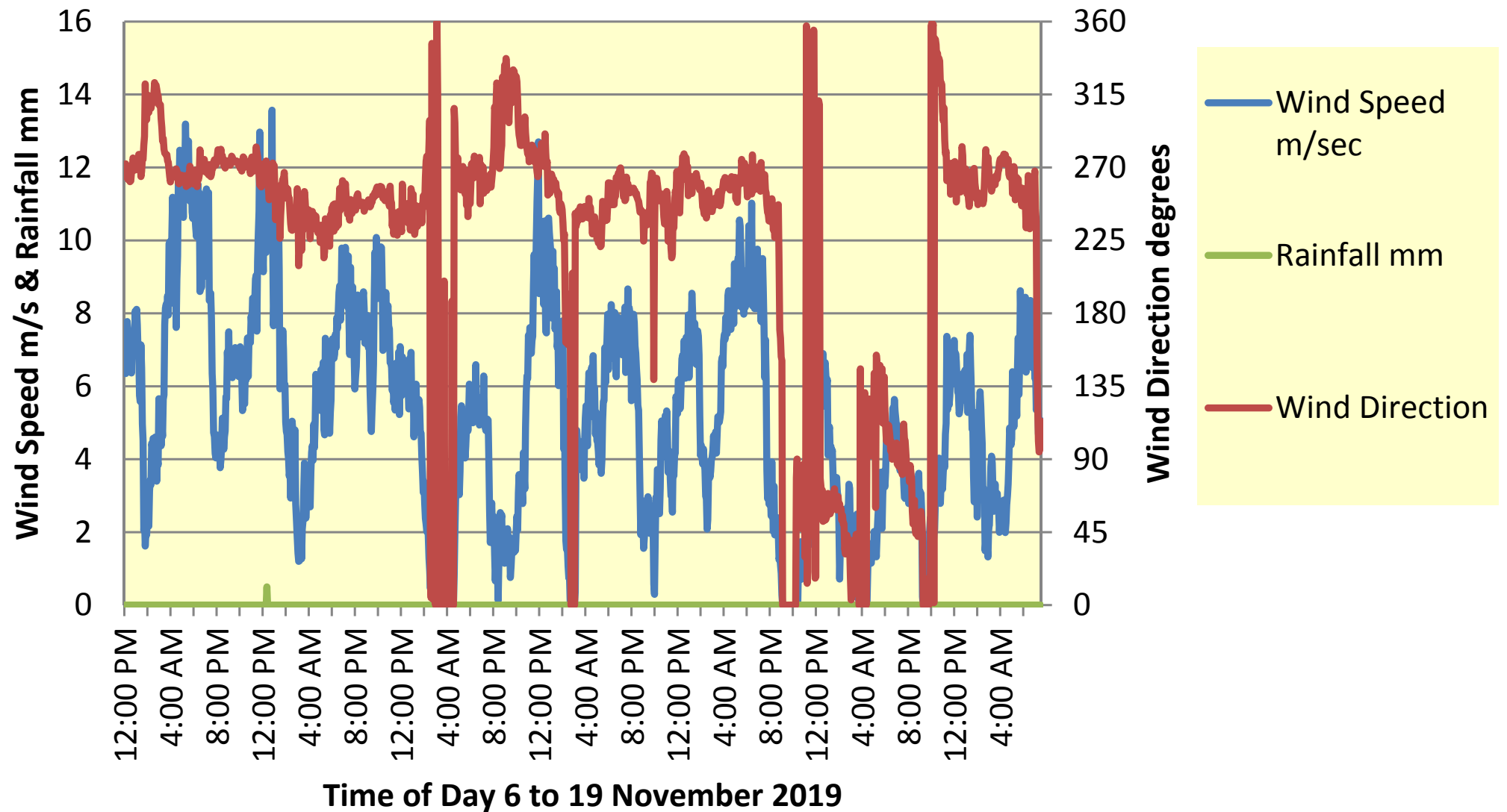


Figure 4.24: Boral Cement Berrima Annual Noise - Meteorological Data
Wind speed and rainfall 6 to 19 November 2019

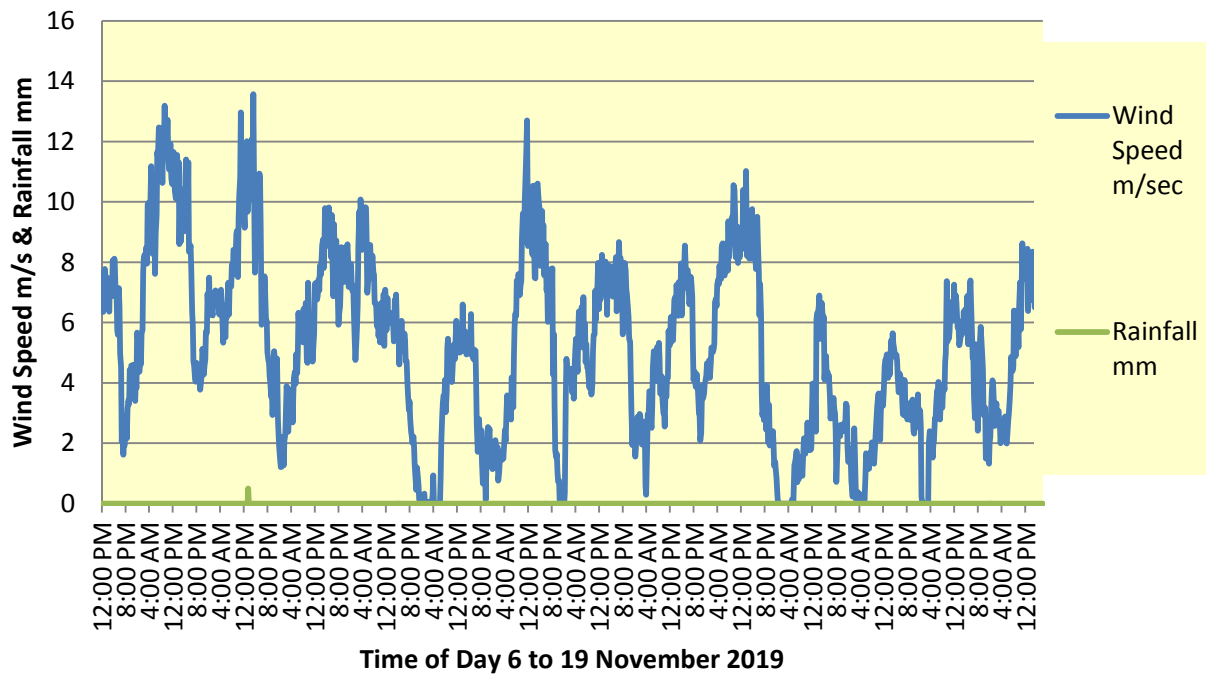
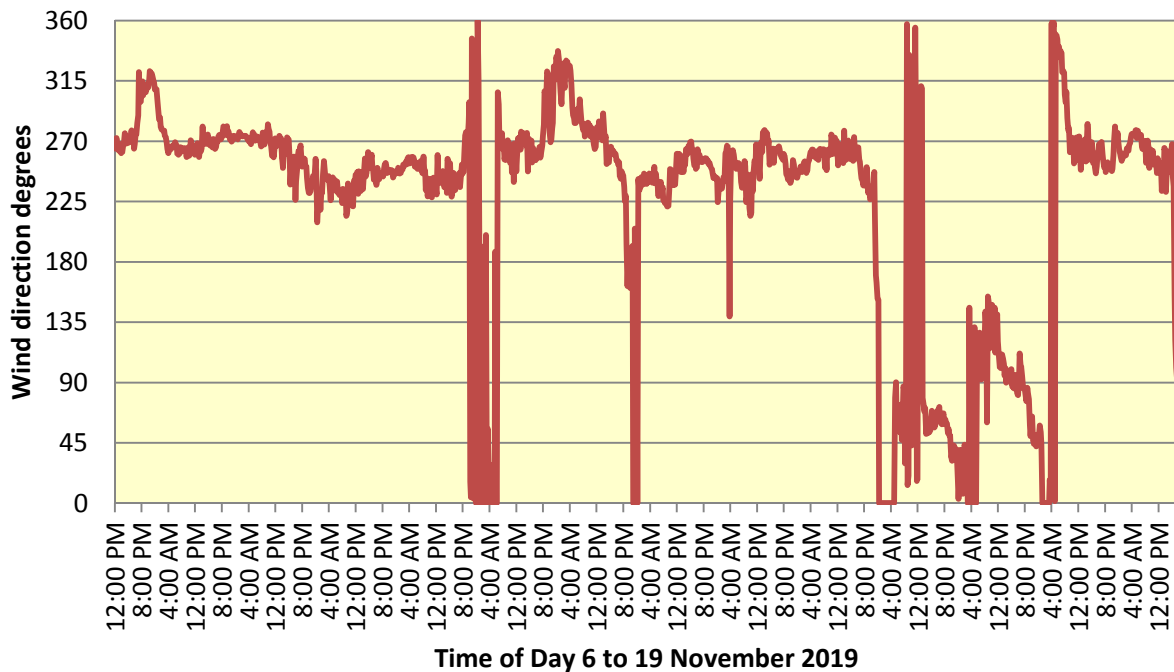


Figure 4.25: Boral Cement Berrima Annual Noise - Meteorological Data
Wind direction 6 to 19 November 2019



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 measurements were also taken in Argyle Street on the western side, 30m north of Taylor Avenue, and the same distance as the front of the first house on the eastern side of Argyle Street not facing Taylor Avenue. Table 4.1 has the collated long-term average results for each unattended monitoring location and figures 4.11 to 4.16 the graphs of those average results since 2002.

Environmental Noise Level Assessment Report shows the collated results and comments for the attended measurements, given in Appendix I. Table 4.7 shows the one-third octave band spectra from the attended monitoring. Figures A54 to A60 in Appendix A show the one-third octave band spectra and tonality graphs for each attended monitoring location. Figures A61 to A99 show the $L_{eq,15min}$ and $L_{90,15min}$ comparison graphs for each attended measurement and Figures A100 to A106 show the Low Frequency Assessment grouped by receiver location. Figures H1 to H34 in Appendix H show the narrow band spectra analysed from the site sound recordings. Table 4.8 provides a summary of the attended statistical sound level results and figures 4.26 to 4. 2 compare these statistical results.

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

Results for 4 Melbourne St attended measurements are shown in Appendix I: Environmental Noise Level Assessment Report, with unattended measurements shown in Appendix B and Table 4.1, long-term unattended results in Table 4.2 and Figure 4.11. Results have been collected for this location since 2002. Attended measurements were obtained for daytime on 10 September and 2 October, evening on and night-time on 2 October.

Sound levels in residential receiver areas continue to be mainly caused by road traffic noise, either on Taylor Avenue or Melbourne Street, and from the Hume Freeway at night-time. The noise emissions from the Cement Plant form the background sound levels on most occasions. Cement Plant sources audible included fans and thumps on occasions. Tonal noise was not evident on most occasions or for 15-minute sample periods. Night time sound levels were ranging typically from 40 to 50 dBA during these periods.

One-third octave band sound levels are shown in Appendix A, Table 4.7 and spectra and tonality graphs are combined in Figure A54. The spectra are relatively broad-band with very little tonality evident in either L_{Aeq} or L_{A90} results. Average statistical sound levels were lower than in 2018 and lower than the long-term averages.

Unattended sound levels shown on the two-day graphs of Appendix B show sound levels vary mainly diurnally with some influence from wind speed correlating with wind direction, mainly westerlies.

There was an unique period on night time of 22 September that RM6, RM7, CM6, CM7 and Kiln 6 were off and the night time $L_{A90,15-minute}$ ranged from 35 to 40 dBA, with an average of 37 dBA.

Wind direction has the most significant effect on received sound levels – the difference between south-easterly and westerly winds was 6 to 8 dB. This has been observed in previous surveys.

Average night-time $L_{A90,15-minute}$ sound levels were in the range 37 to 45 dBA.

The long-term average unattended night-time sound levels over the whole measurement period of 48 dBA $L_{Aeq,night}$ and 42 dBA $L_{A90,night}$ are above the PRP recommended PSNLs of 40 and 35 dBA respectively, however the measured sound levels include sound from all sources, not just the Cement Plant.

A comparison with average period sound levels for 72 Taylor Avenue given in Appendix B, show typically a 6 to 7 dB difference for $L_{Aeq,period}$ results and 5 dB differences for $L_{A90,period}$.

Narrow band analyses of the attended monitoring recordings are provided in Appendix H Figures H1 to H2, H22 and H28. Graphs are presented in linear scales. They show a spectral peak at 176 Hz related to the speed of the main PHT ESP fan, with its height depending on the time of the day. A smaller peak occurs at 415 Hz. These peaks are not seen as tonal in the one-third octave band analyses and would need to be over 25 dB high at this resolution to be significant. There is a peak at 120 Hz which does not correspond with known Cement works Noise sources.

4.3.2 72 Taylor Avenue

The location used for the attended measurements this year was in front of the main gate, 72 Taylor Avenue. The unattended measurements were made at the same location as in the past at 1m in front of the house. Attended measurements were obtained for daytime on 10 September and 2 October, evening and night on 2 October.

Results for attended measurements are shown in Appendix I: Environmental Noise Level Assessment Report, with unattended measurements shown in Appendix C and Table 4.1, long-term averages of unattended results in Table 4.2 and Figure 4.12. Appendix A Table 4.7 has the one-third octave band spectra and tonality assessment with Figure A55 showing graphs of the spectra and tonality.

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, with high wind speeds also having an effect, as seen in the two-day sound level graphs of Appendix C.

Attended L_{A90} sound levels were 43 to 49 dBA during daytime and evening and 45 dBA in night-time. Late at night Hume Freeway traffic can also be audible. Unattended measurements show L_{A90} values were mainly between 45 and 50 dBA with some periods of 40 dBA occurring when the wind was either northerly or easterly. While lower L_{A90} sound levels of around 40 dBA occurred during the kiln shut-down, this was also at the time when easterly and northerly winds occurred and similar sound levels occurred with the whole plant operating with those same wind conditions. Other plant items being off did also not appear to have a correlation in lower sound levels at the location.

Cement Plant site sources identified included the alarm from the eastern (Truck) access gate opening and closing and occasional reversing alarms.

Measured one-third octave band spectra are shown in Appendix A, Table 4.7 and Figures A55 show the spectra and tonality assessment graphs. The spectra are broad-band and there are no tonal elements identified.

Narrow-band spectra are shown in Appendix H figures H3 to H5, H23 and H24. As with 4 Melbourne Street analyses, the main peak visible is at 170 Hz – this difference to 176 Hz at Melbourne St is related to minor speed variation in the fan. The 415 Hz peak is lower but visible.

The long-term average unattended night-time sound levels over the whole measurement period of 54 dBA $L_{Aeq,night}$ and 47 dBA $L_{A90,night}$ are above the PRP recommended PSNLs of 43 and 38 dBA

respectively and below 2018 and approximately the same as the long-term average values. The measured sound levels include sound from all sources, not just the Cement Plant.

4.3.3 12 Brisbane Street

Monitoring locations used for 12 Brisbane Street were the same as in the previous measurements. L_{Aeq} results are affected by road traffic noise from Taylor Avenue and Brisbane Street as well as the Hume Freeway at times of westerly winds. Cement Plant noise emissions also contribute at this location. Unattended sound levels were monitored from 10 September to 23 September

Results for attended measurements are shown in Appendix I: Environmental Noise Level Assessment Report, with unattended measurements shown in Appendix D and Table 4.1, long-term averages of unattended results in Table 4.2 and Figure 4.1. Table 4.7 has the one-third octave band spectra and tonality assessment with Figure A58 showing graphs of the spectra and tonality.

Attended daytime and evening L_{Aeq} results were 45 to 48 dBA with the higher value in the evening from increased road traffic, while night-time had 47 dBA. L_{A90} results for the same periods were 46 dBA daytime, evening 43 dBA and 45 dBA at night.

Long-term average night-time sound levels from unattended monitoring were 49 dBA L_{Aeq} and 43 dBA L_{A90} , compared to the PRP recommended objectives of 40 and 35 dBA respectively. As with the other measurements the total sound levels include sources other than the Cement Plant. Average sound levels were higher than 2018 and the long-term average by 0 to 3 dB.

Graphs of unattended statistical sound levels in Appendix D show slightly lower sound levels occurring with northerly or easterly winds, with wind speed and direction having more effect than major plant non-operation. Quieter $L_{A90,15-min}$ sound levels ranged from 36 to 42 dBA (when the plant was off) while higher level periods ranged from 50 to 57 dBA, even with major plant not operating.

Road traffic on Taylor Avenue is the source of the highest sound levels. Hume Freeway traffic is also significant at night-time with westerly winds. Site noise was noted as general industrial with observed slight tone at 160Hz band. The PHT fan noise would have been the source of a minor tonal noise in the 160 to 200 Hz one-third octave bands.

One-third octave band sound level graphs of the attended measurements, shown in Figures A58 are generally broad-band and non-tonal, as occurred for the other residential measurements.

Narrow-band spectra from attended measurements are shown in Appendix H figures H20, H29 and H31. The daytime spectra have few stand-out peaks, with peak at 170 to 176 Hz again and all other peaks were also mostly non-existent, especially in daytime. None of the measurements are considered to have tonal aspects.

Low-frequency screening assessment

For 12 Brisbane St, a C-weighted sound level logger was also placed at the residence to provide a difference between C and A weighted sound levels for a low-frequency assessment. Results are shown in the two-day figures of Appendix D. For a low-frequency screening assessment, the criterion is $L_{Ceq,15-min} - L_{Aeq,15-min}$ difference is greater than 15 dB.

For most of the monitoring period the $L_{Ceq,15-min} - L_{Aeq,15-min}$ difference ranged between 5 and 18 dB and the higher differences appeared to occur with higher wind speed periods, indicating an influence from wind-in tree noise. Over the whole monitoring period, the period average (day, evening and

night) differences were 10 dB in daytime, 13 dB in evening and 15 dB in night-time. For 22% of all periods the difference was greater than 15 dB.

If $L_{C90,15-min} - L_{A90,15-min}$ difference is considered, the 15 dB difference criterion is exceeded for 39% of all periods. The period averages are 14 dB day and evening and 16 dB night-time.

The sources of the low-frequency noise content may include more than the Cement Plant. From around mid-day on 21 September, the C-weighted sound levels increased significantly by approximately 10 dB, when there was no change in wind conditions or operational conditions apparent at the plant. This may be caused by locally operating air-conditioners or similar. Further assessment of this would be required before assuming that all of the low-frequency components of the noise arise from the Cement Plant.

4.3.4 30 Adelaide St.

This location was added to provide background sound levels prior to commencement of operation of the Austral Bricks Quarry for the nearest residential receivers to its access road.

Results for attended measurements are shown in Appendix I: Environmental Noise Level Assessment Report, and summarised in Table 4.8, with unattended measurements shown in Appendix E and Table 4.1. Table 4.7 has the one-third octave band spectra and tonality assessment with Figure A60 showing graphs of the spectra and tonality. Unattended sound levels were monitored from 10 September to 23 September.

Road traffic noise on Taylor Avenue and local roads was the source of higher sound levels, with wind noise being significant at higher wind speeds. Industrial noise from the Cement Plant was audible as low-level general broad band industrial noise. Some variation of the sound level occurred with variations in wind as noted for other monitoring locations. Statistical sound levels at this location were lower than at the other monitoring locations and similar to Melbourne St, as seen in figures 4.26 to 4. 2. This is because the location is more distant from road traffic sources and industrial sources, at 270m north of Taylor Avenue.

Unattended sound level statistical averages for L_{A90} were comparably low with the other sites but not the lowest – 4 Melbourne St had lower average $L_{A90,period}$ sound levels for daytime, but evening and night-time periods were lowest. As with other sites, lower sound levels with and without major plant off and depended on wind direction more than plant non-operation. Time-scatter graphs in Appendix E show slightly higher sound levels with southerly quadrant winds but the same range of sound levels occurred for all wind speeds and directions.

Figure A60 show the one-third octave band spectra are non-tonal with the 160 Hz band being easily observed.

Narrow-band spectra are shown in Appendix H Figures H21 and H30 with the peak at 170 to 176 Hz observed.

4.3.5 Argyle St

Attended sound levels are measured at the western side of Argyle Street 30m north of Taylor Avenue. Measurements have been done in the evening and night-time as daytime measurements are affected by noise from the adjacent shop and road traffic noise. Attended sound levels are shown in Appendix

I: Environmental Noise Level Assessment Report and summarised in Table 4.8. One-third octave band sound levels are shown in Figures A59 and narrow band spectra in Figures H25 and H32.

The main noise sources at this location are traffic along Taylor Avenue and its extension to the Hume Highway to the west, and Hume Freeway noise. Cement Plant noise is audible at times as a general industrial noise, but is lower than in other monitored locations because of the additional distance.

One-third octave band spectra from the measurements are shown in Appendix A, Table 4.7 and Figure A59. Spectra are broad-band and non-tonal.

Narrow-band spectra are shown in Appendix H Figures H25 to H32. They show that the frequency peak at 170 and 176 Hz was easily observable.

The Cement plant is considered to not be a significant source at this location.

4.3.6 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 I: Environmental Noise Level Assessment Report, and summarised in Table 4.8, with unattended measurements shown in Appendix F and Table 4.1, long-term unattended results in Table 4.2 and Figures 4.14 measured between 10 September and 26 September. The results of the reliable data points are similar to those of previous years. Statistical averages are slightly lower than the 2018 results but similar to the long-term averages.

Taylor Avenue vehicle movements are lower at this location than for the residential locations but are still an influence. Site sources identified in the attended monitoring included vehicle movements and general industrial noise.

Measured attended L_{Aeq} sound levels were 51-55 dBA daytime and night-time, 55 dBA evening. For L_{A90} sound levels 46-54 dBA for all periods measured.

One-third octave band spectra of attended measurements are shown in Appendix A, Table 4.7 and Figure A56. Spectra were broad-band and non-tonal. Higher octave band sound levels in the 80 and 100 Hz bands is related to diesel vehicle noise.

Narrow-band spectra are shown in Appendix H Figures H6 to H10, H27, and H33. As with other measurements they show a peak at 170 to 176 Hz related to FA39 for daytime and evening.

A comparison between the results for the North Fence and other New Berrima residential receivers is shown in Tables 4.9 and 4.10. The highest differences occur for 4 Melbourne St and 30 Adelaide St, which have similar differences – this is despite 30 Adelaide St being 790m from CM7 while 4 Melbourne St is 615m. This also indicates the effect that road traffic noise has on sound levels at residences near Taylor Avenue.

4.3.7 Store Yard Close location

This location is proposed to be a monitoring location to replace the monitoring at the other locations to indicate achievement of continuously acceptable sound levels from the Cement Plant site, without significant intrusion from other external noise sources (traffic) outside the plant boundary. Objectives of a long-term $L_{A90,period}$ over 7 days of 56 dBA and 58 dBA for any 15-minute period without transient noise sources have been proposed. Earlier discussion of the results of this monitoring was provided in Section 4.2.

There was an instrument failure in the initial survey period of 10 September to 2 October due to moisture and extreme heat, consequently the successful logging period of this location occurred from 6 November to 19 November. Due to different meteorological conditions in this period, comparisons to other receiver sites could not be done.

Results discussed in this section are for attended monitoring and one-third octave band and narrow-band analyses. Results of the attended monitoring are given in Appendix I: Environmental Noise Level Assessment Report, and summarised in Table 4.8. Appendix G provides the unattended sound level results and Appendix H the analysed narrow band spectra of attended sound level recordings.

Main sources were industrial noise of fans from the main parts of the plant, locomotive and train movements at times (sometimes with wheel squeal) and internal traffic movements. Mobile equipment loading and stockpile operations on the southern side of the rail line were noted during some measurements.

Appendix A: Table 4.7 show one-third octave band and tonality assessments, with Figures A57 showing the spectra and tonality assessment. The spectra are relatively broad-band and non-tonal. A event measured on 10 September showed noticeable peaks in the 80 and 100 Hz band indicating diesel motors associated with trucks and heavy vehicles.

Narrow-band spectra are shown in Appendix H figures H25 and H32. They show similar peaks in the spectrum to other measurements – 160-168 Hz from unknown sources and 415 Hz.

Unattended sound levels shown in the two-day graphs of Appendix G show fairly constant sound levels for $L_{Aeq,15-min}$ between 53 and 62 dBA and for $L_{A90,15-min}$ 50 to 56 dBA. Wind speed and direction had minimal effect on L_{90} sound levels.

Weather conditions during the measurement period for the Store Yard Close location included extended periods of high wind speeds, mostly westerlies. Figures 4.23 to 4.25 show a summary of the weather conditions for the period 6 to 19 November. Rain for extended periods did not occur during the period. Wind speeds exceeded 10m/s for 6% of the period and 5m/s for 51% of the period. There were only 6% of periods with calm wind conditions. Long-term average statistical sound levels shown in Table 4.2 and Figure 4.15 were higher than previous years because of the higher wind speed. Sound levels over all have not changed significantly since monitoring at this location commenced.

4.3.8 Low Frequency sound assessment for receiver locations

As noted in section 4.2.3, the recently introduced 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 ($L_C - L_A$) 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. The criterion values 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. 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.

An analysis of the exceedance of the screening criteria and one-third octave band levels has been made for the attended monitoring at the receiver locations for both L_{eq} and L_{90} sound levels. L_{90} has also been used because of the influence of road traffic and other intermittent noise sources which affects L_{eq} values. Results of the analysis are given in Table 4.10 and also in Figures A100 to A106.

The analysis of residential receiver locations indicates that For L_{eq} values the frequency band criteria are exceeded for all locations in daytime but not for all locations at night-time or evening. The exceedance depends on the distance from Taylor Avenue, the closer the distance the higher the exceedance. It is considered that the residential receiver locations currently exceed the low frequency criteria in the NPI on some occasions in daytime, but the source of this low-frequency exceedance noise is not necessarily from the Cement Plant and is considered more likely to be from road traffic diesel vehicle noise. Night-time and evening exceedances are mostly only occurring at 72 Taylor Avenue

Based on this assessment it is considered that the residential receiver locations currently exceed the low frequency criteria in the NPI mainly in daytime, but the source of this noise is not necessarily from the Cement Plant and is considered more likely to be from road traffic diesel vehicle noise.

Table 4.8: Boral Cement Berrima - 2019 Annual Noise Assessment

Summary of attended receiver statistical sound level results

Location	File No	Date	Time	Period (sec)	Time of Day	Statistical Sound Levels - dB				
						L1	L90	Leq	LeqC	Lceq-Laeq
12 Brisbane St.	4	2/10/19	21:28	900	Evening Time	52	43	45	62	17
12 Brisbane St.	8	2/10/19	22:45	900	Night Time	54	45	47	62	14
12 Brisbane St.	639	2/10/10	16:23	900	Day Time	62	43	51	65	14
30 Adelaide St.	3	2/10/19	21:09	900	Evening Time	58	42	46	63	17
30 Adelaide St.	9	2/10/19	23:05	900	Night Time	51	42	45	63	18
30 Adelaide St.	200	10/9/19	10:06	900	Day Time	52	46	48	66	18
30 Adelaide St.	640	2/10/19	16:45	900	Day Time	53	42	45	63	18
4 Melbourne St.	195	2/10/19	16:50	900	Day Time	67	46	56	67	11
4 Melbourne St.	122	10/9/19	12:17	900	Day Time	69	50	58	69	11
4 Melbourne St.	1	2/10/19	20:28	900	Evening Time	64	45	51	66	15
4 Melbourne St.	7	2/10/19	22:25	900	Night Time	60	45	50	63	14
72 Taylor Ave ~ Outside house	123	10/9/19	12:55	900	Day Time	80	49	67	79	12
72 Taylor Ave ~ Outside house	196	2/10/19	17:28	900	Day Time	75	47	63	72	8
72 Taylor Ave ~ Outside house	2	2/10/19	20:48	900	Evening Time	70	46	57	69	12
72 Taylor Ave ~ Outside house	10	2/10/19	23:25	900	Night Time	67	49	54	67	13
Argyle St, 30m N of Taylor Ave.	5	2/10/19	21:47	900	Evening Time	60	46	50	62	12
Argyle St, 30m N of Taylor Ave.	6	2/10/19	22:04	900	Night Time	62	44	50	61	11
North Fence	19	6/11/19	15:11	900	Day Time	57	48	50	68	18
North Fence	21	19/11/19	12:31	900	Day Time	57	49	52	68	17
North Fence	194	2/10/19	16:03	900	Day Time	56	49	51	68	17
North Fence	119	10/9/19	10:34	900	Day Time	61	52	55	69	14
North Fence	16	1/11/19	13:30	900	Day Time	57	46	51	69	18
North Fence	14	15/10/19	14:22	900	Day Time	56	46	50	68	19
North Fence	13	15/10/19	13:59	900	Day Time	56	47	50	69	19
North Fence	199	2/10/19	19:37	900	Evening Time	53	49	51	67	17
North Fence	11	3/10/19	0:14	900	Night Time	58	54	55	67	12
Stock Yard	120	10/9/19	11:30	900	Day Time	72	59	62	78	16
Stock Yard	121	10/9/19	11:48	302	Day Time	62	55	57	71	14
Stock Yard	15	15/10/19	15:04	900	Day Time	60	52	55	71	17
Stock Yard	17	1/11/19	14:03	900	Day Time	66	53	57	73	16
Stock Yard	18	1/11/19	15:33	900	Day Time	60	53	55	72	17
Stock Yard	193	2/10/19	15:33	900	Day Time	66	52	56	71	15
Stock Yard	20	6/11/19	16:24	900	Day Time	64	53	59	79	20
Stock Yard	22	19/11/19	13:18	900	Day Time	68	54	58	74	16
Stock Yard	192	2/10/19	15:12	900	Day Time	67	52	55	71	16
Stock Yard	200	2/10/19	20:04	900	Evening Time	61	56	58	72	14
Stock Yard	12	3/10/19	0:37	900	Night Time	62	59	60	72	12

**Figure 4.26: Boral Cement Berrima 2019 Annual Environmental Noise Assessment - Summary of
Attended monitoring statistical results**

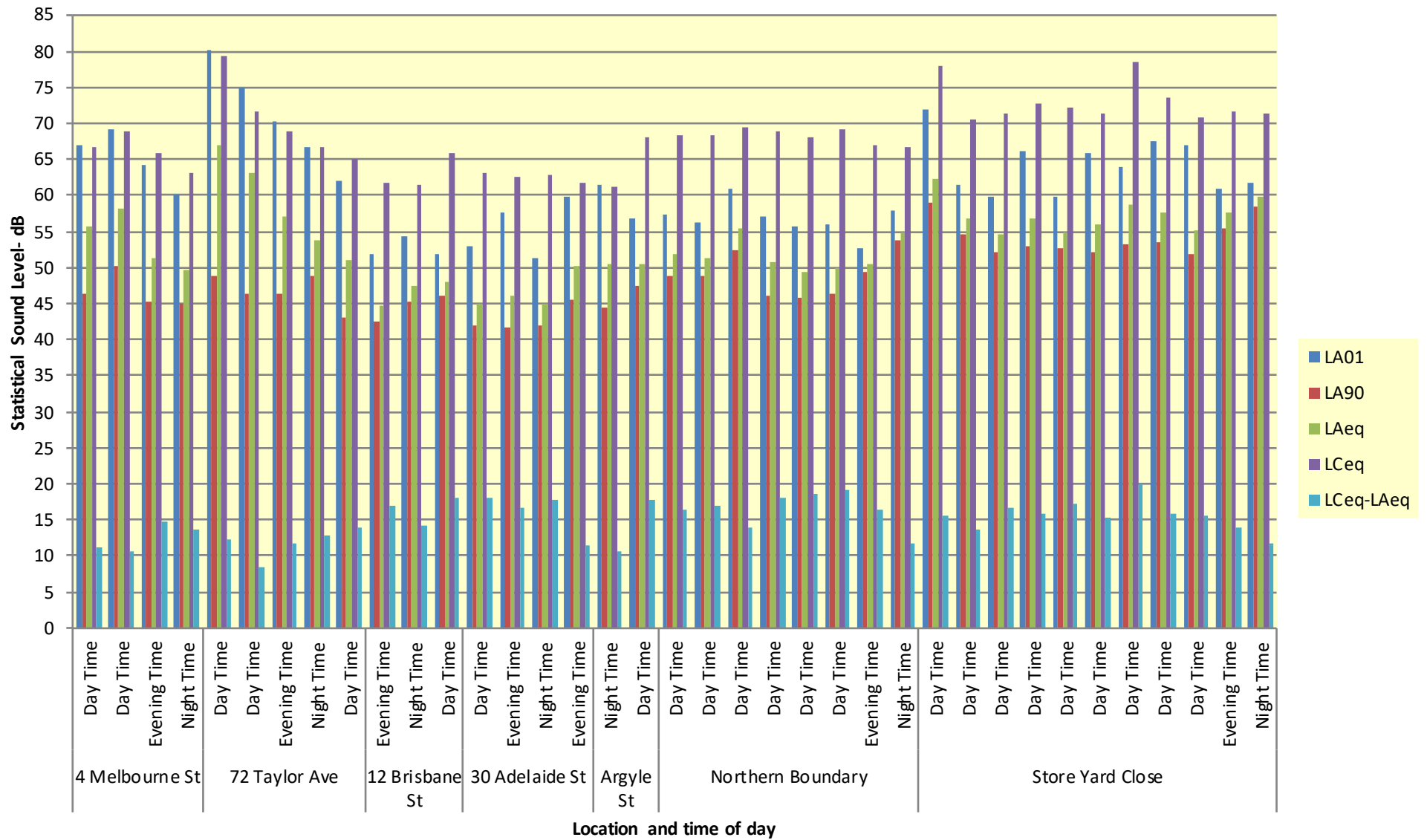


**Figure 4.27: Boral Cement Berrima 2019 Annual Environmental Noise Assessment - Summary of
Attended monitoring statistical results**

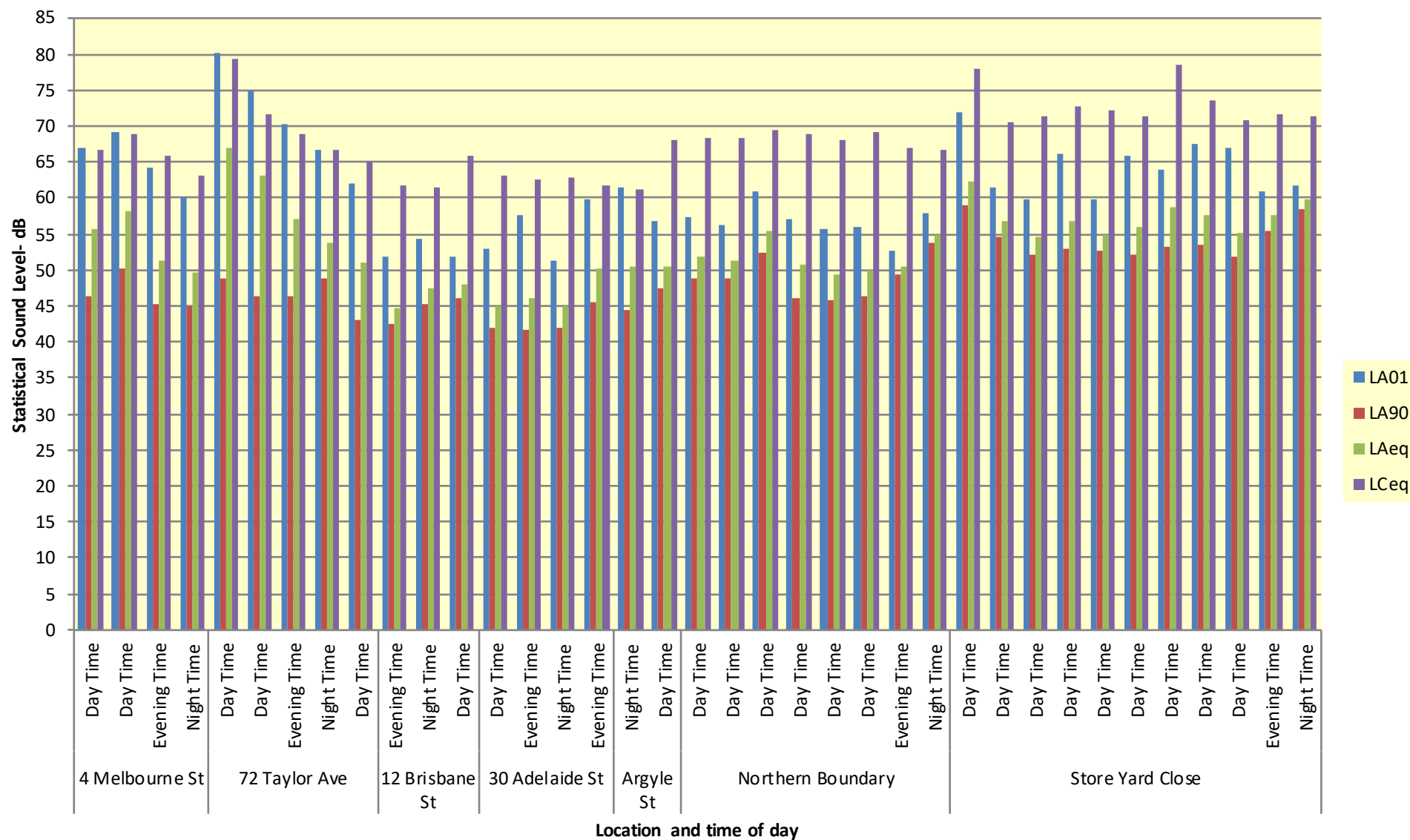


**Figure 4.28: Boral Cement Berrima 2019 Annual Environmental Noise Assessment - Summary of
Attended monitoring statistical results**

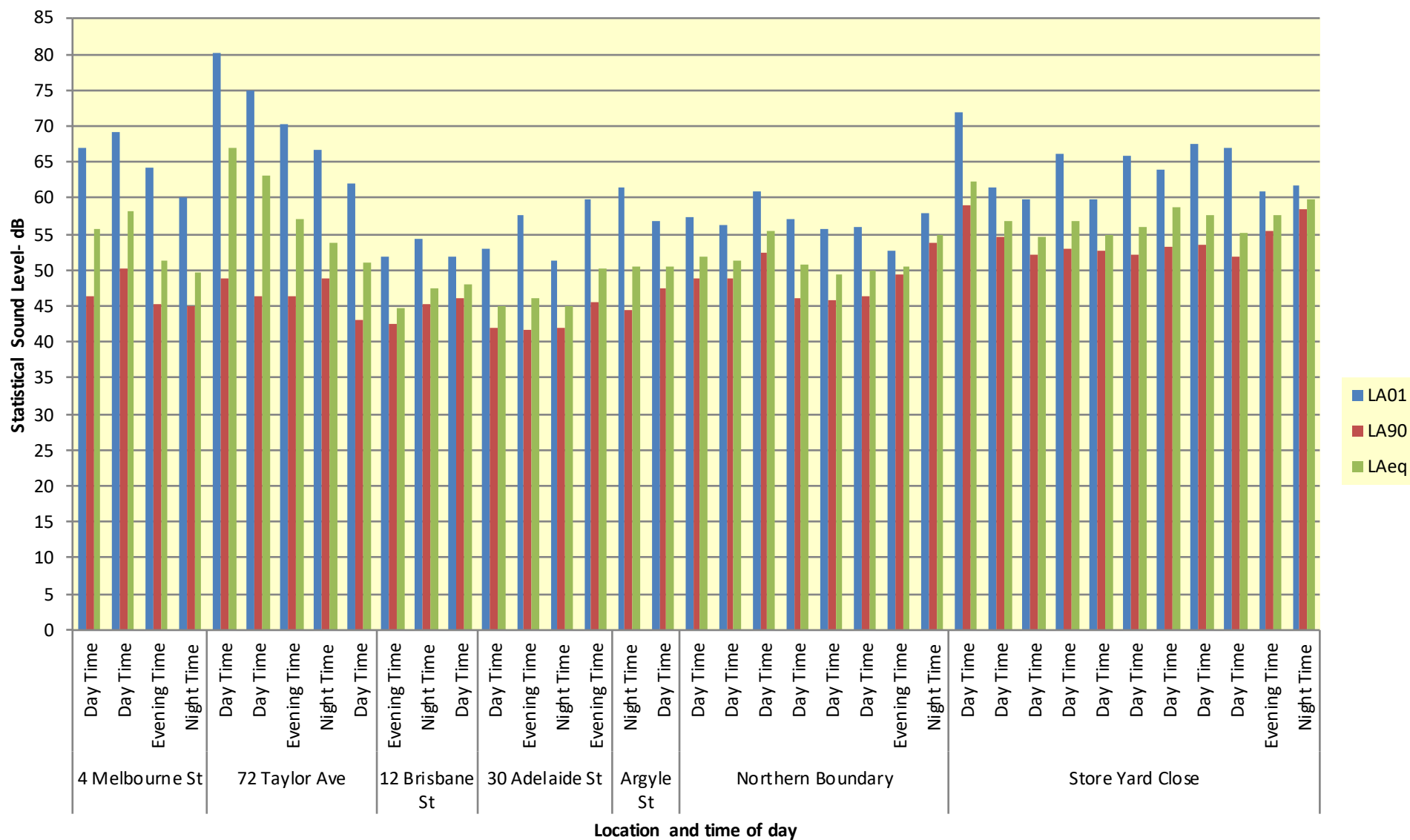


**Figure 4.29: Boral Cement Berrima 2019 Annual Environmental Noise Assessment - Summary of
Attended monitoring statistical $L_{A90,15\text{-min}}$ and $L_{Aeq,15\text{-min}}$ results**

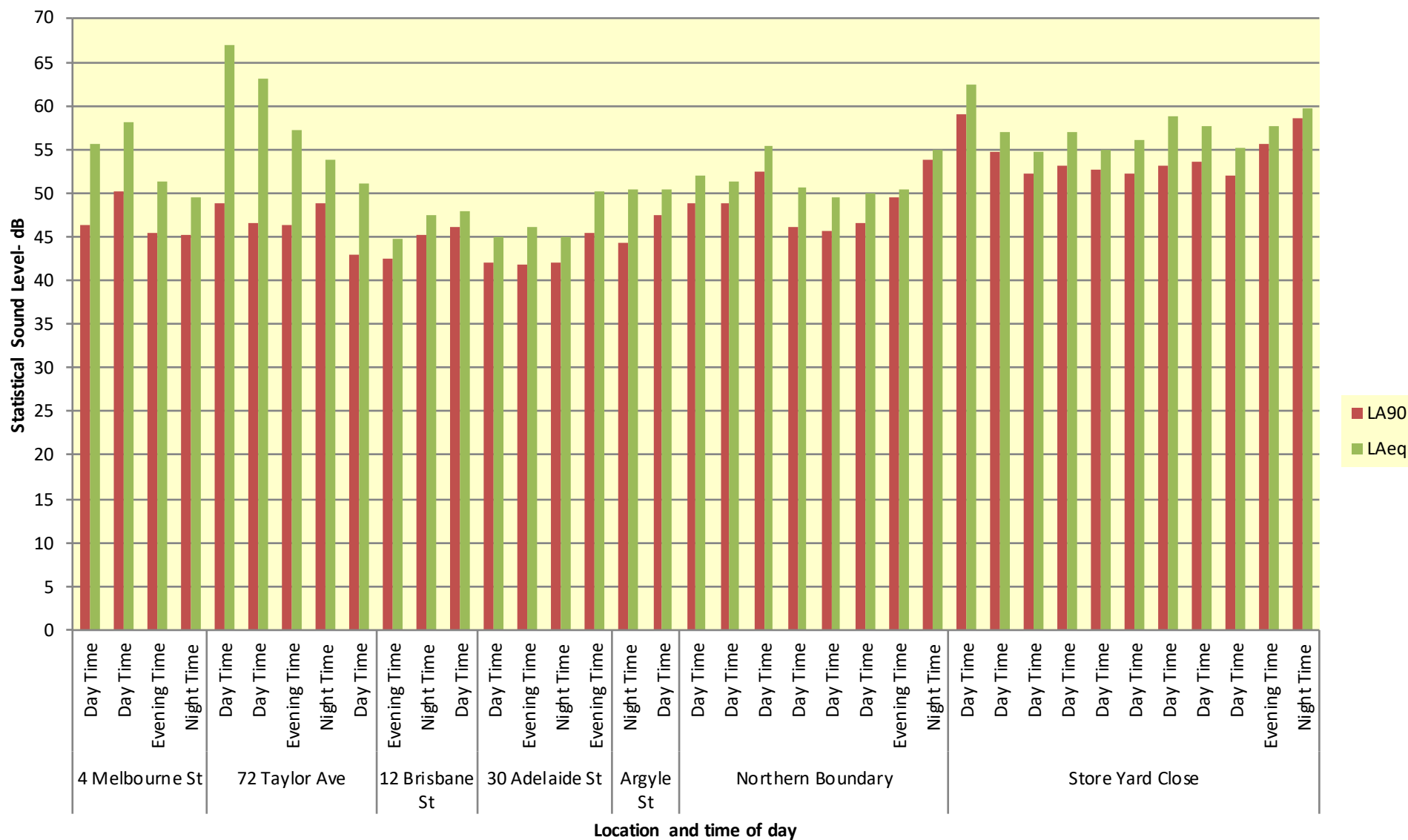


**Figure 4.30: Boral Cement Berrima 2019 Annual Environmental Noise Assessment - Summary of
Attended monitoring statistical $L_{A90,15-min}$ and $L_{Aeq,15-min}$ results**

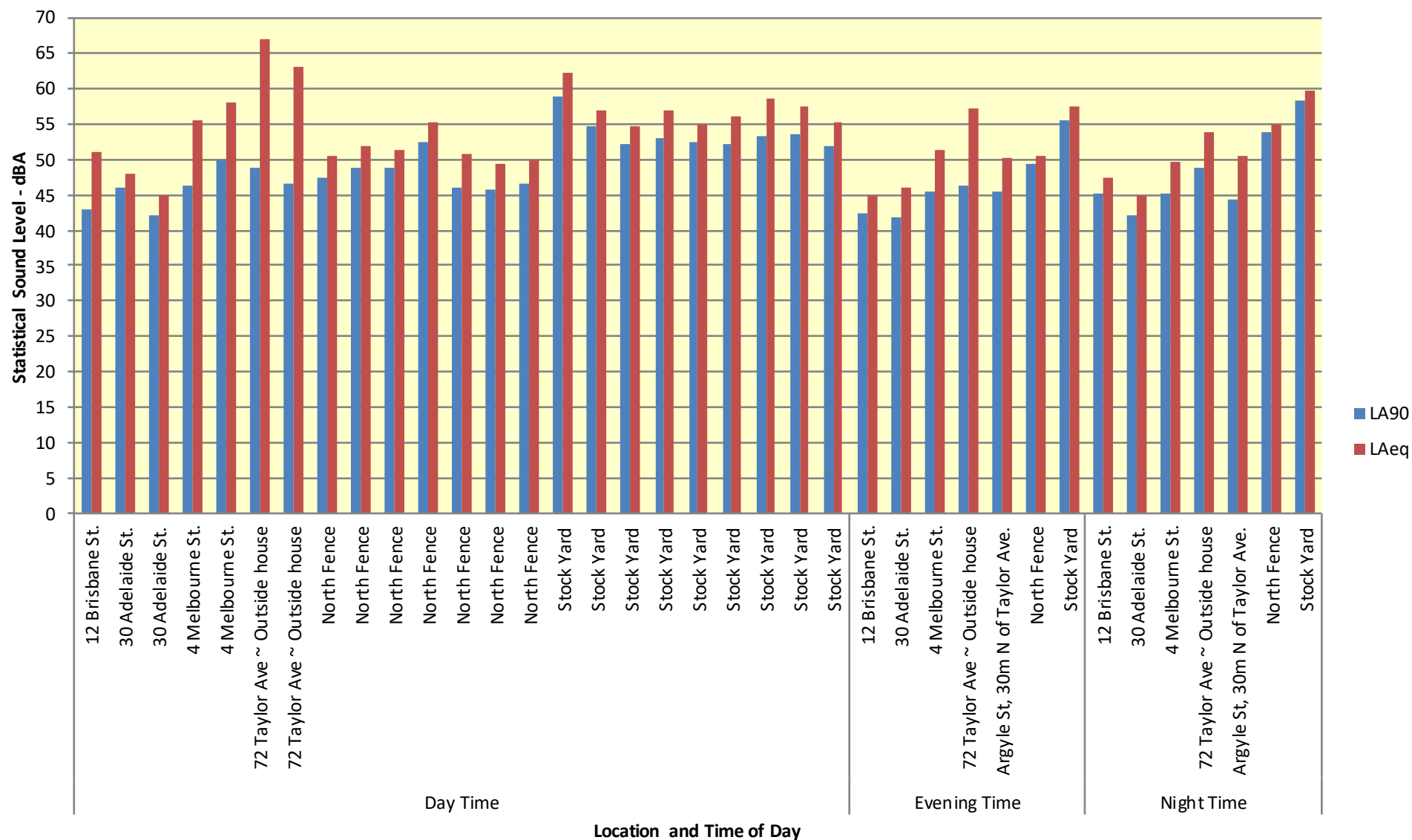


**Figure 4.31: Boral Cement Berrima 2019 Annual Environmental Noise Assessment - Summary of
Attended monitoring
L_{A90,15-min} results**

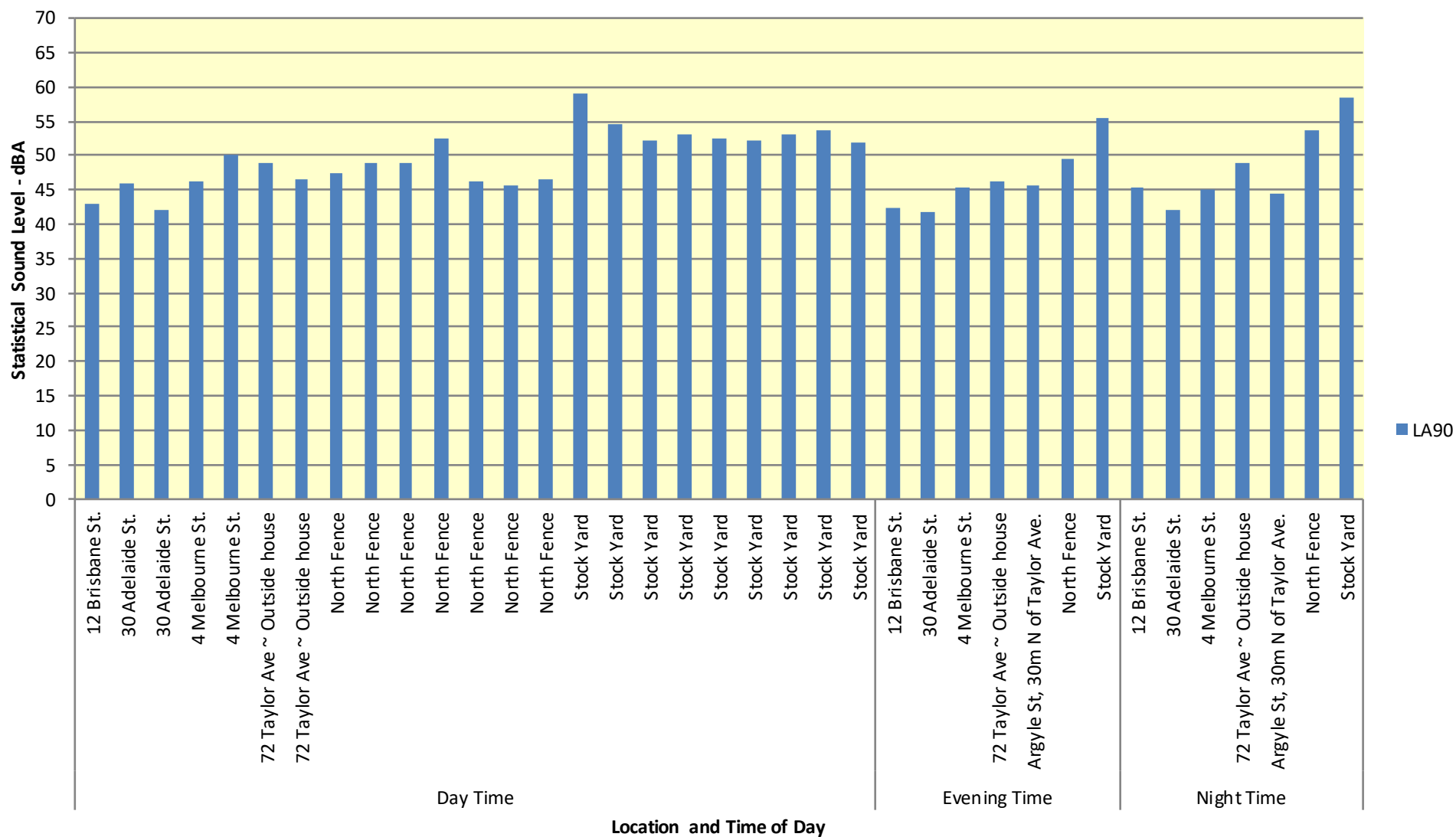


**Figure 4.32: Boral Cement Berrima 2019 Annual Environmental Noise Assessment - Summary of
Attended monitoring
 $L_{Aeq,15-min}$ results**

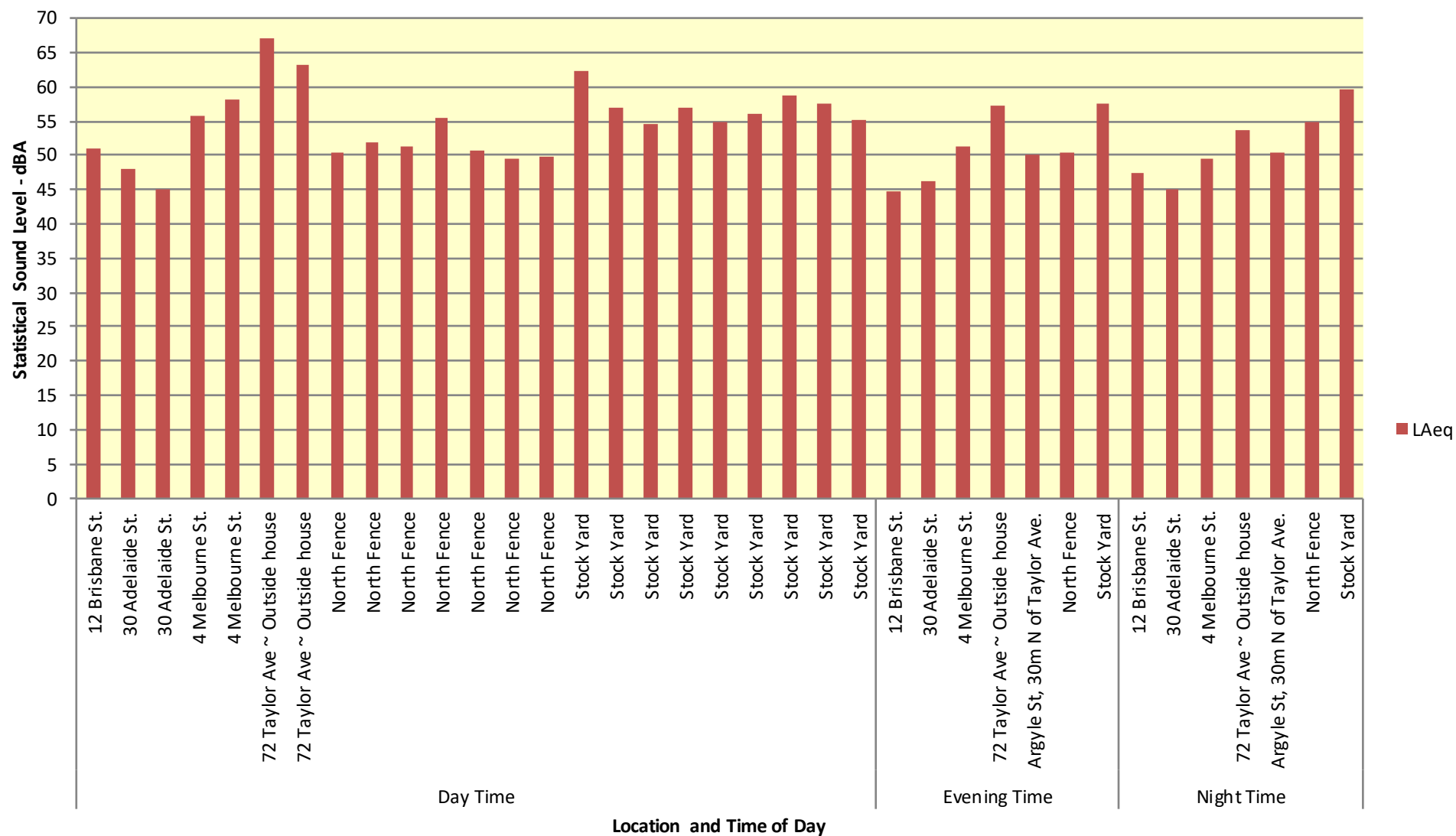


Table 4.9 10 to 26 September 2019
Comparison of Period LAEQ, Period Average LA10 and Period 90% LA90 Results
Summary of Statistical Data

LAEQ.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}
North Fence, New Berrima	57	48	51	56	47	51	56	47	51	55	47	51
4 Melbourne St	60	50	53	52	43	48	52	43	47	55	46	50
72 Taylor Ave.	64	56	60	58	51	54	59	49	54	53	48	50
12 Brisbane St.	58	51	54	57	46	51	56	43	49	62	44	52
30 Adelaide St	59	48	51	50	43	47	51	41	46	60	40	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}
North Fence, New Berrima	54	42	46	45	53	43	47	46	53	40	47	46
4 Melbourne St	49	36	41	40	46	37	41	40	46	34	40	39
72 Taylor Ave.	54	43	46	45	52	42	45	45	54	39	45	44
12 Brisbane St.	53	39	44	42	51	41	44	43	52	36	43	43
30 Adelaide St	48	37	42	40	47	36	41	40	47	33	40	40

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}
North Fence, New Berrima	54	43	48	47	54	44	48	47	54	43	49	48
4 Melbourne St	50	38	43	42	48	38	42	41	48	36	42	41
72 Taylor Ave.	55	45	48	47	54	42	47	46	55	41	47	46
12 Brisbane St.	53	42	46	45	53	40	46	45	52	38	45	44
30 Adelaide St	49	41	44	43	48	38	43	42	48	35	43	43

Table 4.9A: Comparison of Period LAEQ, Period Average LA10 and Period 90% LA90 Results for North Fence with
4 Melbourne, 72 Taylor, 12 Brisbane and 30 Adelaide

	LAeq,period average				LA90,15-min Period Average			L90.15-min 10%		
	Day	Evening	Night	24-hr	Day	Evening	Night	Day	Evening	Night
North Fence - 4 Melbourne	-2	3	4	1	5	7	7	5	6	8
North Fence - 72 Taylor	-9	-3	-3	1	-1	2	2	0	2	2
North Fence - 12 Brisbane	-3	0	2	-1	2	3	4	3	4	4
North Fence - 30 Adelaide	0	4	5	2	4	6	6	5	6	6

Table 4.10: Boral Cement Berrima Annual Noise 2019 - Low frequency assessment for attended monitoring - exceedance of criteria for each location measurement

Time of Day	Location	Date & Time	Parameter	Exceedance of criterion by measurement dB in One-third Octave Frequency Band Hz											
				12.5	16	20	25	31.5	40	50	63	80	100	125	160
Day Time	4 Melbourne St.	10/09/2019 12:17	Leq	-19	-23	-17	-5	0	3	9	10	10	10	13	13
Day Time	4 Melbourne St.	10/09/2019 12:17	L90	-6	-9	-6	-4	-2	1	1	0	1	2	6	7
Day Time	4 Melbourne St.	2/10/2019 16:50	Leq	-19	-23	-19	-7	-4	2	7	9	9	7	11	12
Day Time	4 Melbourne St.	2/10/2019 16:50	L90	-6	-9	-6	-4	-2	1	0	1	1	2	2	4
Evening Time	4 Melbourne St.	2/10/2019 20:28	Leq	-29	-29	-20	-6	-5	2	6	5	11	9	10	10
Evening Time	4 Melbourne St.	2/10/2019 20:28	L90	-16	-19	-16	-9	-10	-3	2	-1	1	0	0	7
Night Time	4 Melbourne St.	2/10/2019 22:25	Leq	-28	-30	-21	-6	-8	-2	3	3	4	3	5	8
Night Time	4 Melbourne St.	2/10/2019 22:25	L90	-16	-19	-16	-9	-12	-6	-1	-1	0	0	0	4
Day Time	72 Taylor Ave ~ Outside house	10/09/2019 12:55	Leq	-19	-23	-13	3	4	11	20	25	25	18	25	23
Day Time	72 Taylor Ave ~ Outside house	10/09/2019 12:55	L90	-6	-9	-6	0	-2	3	4	2	3	4	6	7
Day Time	72 Taylor Ave ~ Outside house	2/10/2019 17:28	Leq	-9	-15	-11	0	-2	10	15	11	12	10	13	15
Day Time	72 Taylor Ave ~ Outside house	2/10/2019 17:28	L90	5	1	4	6	9	11	10	6	5	1	3	6
Evening Time	72 Taylor Ave ~ Outside house	2/10/2019 20:48	Leq	-19	-24	-17	0	-3	8	8	5	6	9	8	12
Evening Time	72 Taylor Ave ~ Outside house	2/10/2019 20:48	L90	-6	-9	-6	-2	-2	6	3	0	2	3	3	8
Night Time	72 Taylor Ave ~ Outside house	2/10/2019 23:25	Leq	-29	-28	-19	-3	-2	2	6	5	7	5	8	13
Night Time	72 Taylor Ave ~ Outside house	2/10/2019 23:25	L90	-16	-19	-16	-6	-6	-3	2	0	3	2	4	10
Day Time	North Fence	10/09/2019 10:34	Leq	-26	-24	-15	-3	3	9	12	12	10	9	6	7
Day Time	North Fence	10/09/2019 10:34	L90	-16	-19	-16	-7	-2	3	6	1	2	3	1	2
Day Time	North Fence	2/10/2019 16:03	Leq	-19	-23	-16	-3	1	8	11	10	10	7	5	4
Day Time	North Fence	2/10/2019 16:03	L90	-6	-9	-6	-4	-2	2	5	3	3	3	1	-1
Day Time	North Fence	15/10/2019 13:59	Leq	-19	-22	-12	1	1	6	9	7	7	6	2	6
Day Time	North Fence	15/10/2019 13:59	L90	-6	-9	-6	-2	-2	1	3	1	1	-2	-4	-1
Day Time	North Fence	15/10/2019 14:22	Leq	-19	-23	-13	0	-1	5	8	8	4	2	2	4
Day Time	North Fence	15/10/2019 14:22	L90	-6	-9	-6	-3	-2	1	1	-1	-1	-3	-5	-2
Day Time	North Fence	1/11/2019 13:30	Leq	-19	-23	-13	0	-1	7	9	8	10	3	3	4
Day Time	North Fence	1/11/2019 13:30	L90	-6	-9	-6	-3	-2	3	3	1	0	-2	-4	-1
Day Time	North Fence	6/11/2019 15:11	Leq	-19	-21	-12	0	1	6	6	4	5	2	1	5
Day Time	North Fence	6/11/2019 15:11	L90	-6	-9	-6	-4	-2	1	1	-1	-1	-2	-4	-1
Day Time	North Fence	19/11/2019 12:31	Leq	-19	-21	-12	-2	2	7	8	6	6	4	2	5
Day Time	North Fence	19/11/2019 12:31	L90	-6	-9	-6	-4	-2	2	2	-1	0	-2	-2	0
Evening Time	North Fence	2/10/2019 19:37	Leq	-19	-22	-16	-2	0	8	6	5	7	6	1	6
Evening Time	North Fence	2/10/2019 19:37	L90	-6	-9	-6	-4	-2	4	3	-1	3	3	-2	2
Night Time	North Fence	3/10/2019 0:14	Leq	-19	-23	-16	-3	-3	2	6	4	6	6	3	11
Night Time	North Fence	3/10/2019 0:14	L90	-6	-9	-6	-4	-2	1	2	0	3	3	0	8
Day Time	12 Brisbane St.	10/09/2019 10:06	Leq	-27	-25	-16	-4	-2	1	4	5	6	7	7	10
Day Time	12 Brisbane St.	10/09/2019 10:06	L90	-89	-37	-25	-10	-11	-5	-2	-1	-2	-2	-1	2
Evening Time	12 Brisbane St.	2/10/2019 21:28	Leq	-28	-31	-22	-6	-6	-4	0	-1	0	-2	-2	8
Evening Time	12 Brisbane St.	2/10/2019 21:28	L90	-16	-19	-16	-9	-10	-8	-4	-4	-4	-5	-5	5
Night Time	12 Brisbane St.	2/10/2019 22:45	Leq	-28	-31	-22	-8	-8	-5	-1	1	1	0	2	10
Night Time	12 Brisbane St.	2/10/2019 22:45	L90	-16	-19	-16	-12	-12	-9	-5	-5	-3	-3	-1	7
Day-time	30 Adelaide St.	10/09/2019 10:06	Leq	-27	-25	-16	-4	-2	1	4	5	6	7	7	10
	30 Adelaide St.	10/09/2019 10:06	L90	-89	-35	-22	-8	-7	-4	-1	-1	1	3	4	5
Day-time	30 Adelaide St.	2/10/2019 16:45	Leq	-33	-30	-20	-4	-6	-2	1	1	1	1	1	5
	30 Adelaide St.	2/10/2019 16:45	L90	-89	-37	-23	-6	-11	-6	-3	-3	-2	-3	-3	0
Evening Time	30 Adelaide St.	2/10/2019 21:09	Leq	-29	-32	-22	-5	-7	-2	1	0	1	2	2	7
Evening Time	30 Adelaide St.	2/10/2019 21:09	L90	-16	-19	-16	-8	-11	-6	-2	-3	-3	-1	0	4
Night Time	30 Adelaide St.	2/10/2019 23:05	Leq	-29	-32	-21	-5	-6	-4	0	0	2	1	2	6
Night Time	30 Adelaide St.	2/10/2019 23:05	L90	-16	-19	-16	-7	-10	-7	-4	-4	-1	-2	-1	3
Evening Time	Argyle St, 30m N of Taylor Ave.	2/10/2019 21:47	Leq	-29	-30	-22	-14	-9	-3	1	1	5	2	3	11
Evening Time	Argyle St, 30m N of Taylor Ave.	2/10/2019 21:47	L90	-16	-19	-16	-14	-12	-8	-5	-3	1	-2	-1	8
Night Time	Argyle St, 30m N of Taylor Ave.	2/10/2019 22:04	Leq	-29	-29	-22	-14	-10	-4	0	1	4	2	2	10
Night Time	Argyle St, 30m N of Taylor Ave.	2/10/2019 22:04	L90	-16	-19	-16	-14	-12	-8	-5	-3	1	-2	-1	7

Copy of berrima attended low freq src graphed

5 Summary and Conclusions

The Boral Cement Berrima works has noise limit conditions on two major projects with noise emissions (from 2002 and 2007) – No.6 Kiln Upgrade and No.7 Cement Mill. 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 these projects. Monitoring of both site source sound levels and residential receiver sound levels on an annual basis since 2008 has confirmed that both of the projects are in compliance with their noise limit conditions.

Discussions with the NSW EPA over the past 8 years have sought to include noise limit conditions for the whole site (rather than just the two projects) and these conditions have yet to be finalised. A recommended noise objective for a nominated monitoring site has been proposed inside but close to the plant boundary where noise emissions from sources other than the Cement Plant are not significant; residential receiver locations are affected by other noise sources such as road traffic.

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

- comparative measurements at the same locations around major plant sources of noise which have been assessed previously as in compliance with the limit conditions;
- calculation of the contribution sound levels at residential receiver locations from those source emission locations which are higher than in the past and comparison with a contribution objective;
- monitoring of sound levels in residential receiver locations with unattended monitoring over long-term periods of two weeks and attended monitoring in day, evening and night-time to compare with long-term averages from previous years.

The findings of this 2019 annual environmental noise assessment are that the two projects are in considered to be compliance with their noise limit conditions 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 indicate that the Cement Plant is not increasing its emissions. Long-term average sound levels were lower in several locations.

From the measurements at the proposed in-plant annual environmental noise monitoring location in the Store Yard, it is also considered that the plant is achieving its proposed objectives of 56 dBA for long-term $L_{A90,period}$ and 58 dBA $L_{A90,15-minutes}$ (unaffected by transient noise sources).

Sleep disturbance and Low-frequency noise assessment

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

Calculations of sleep disturbance potential use $L_{A01,1-minute} - L_{A90,15-minute}$ at night-time to provide comparisons with recommended maximum values for night-time of 60 dBA for $L_{A01,1-minute}$ night-time for the Northern Boundary location and not greater than 15 dB difference for $L_{A01,1-minute} - L_{A90,15-minute}$. From the analyses it is considered that the number or times that the objectives of $L_{A01,1-minute}$ greater than 60 dBA and $L_{A01,1-minute} - L_{A90,15-minute}$ 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 and truck bumps were likely to cause the 60 dBA objective to be exceeded. Some rail wheel squeal events also come close to the criteria and may exceed on occasions.

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 both $L_{Aeq,15-min}$ and $L_{A90,15-min}$ values. For L_{eq} values the frequency band criteria are exceeded for all locations in daytime but not for all locations at night-time or evening. The exceedance depends on the distance from Taylor Avenue. It is considered that the residential receiver locations currently exceed the low frequency criteria in the NPI on some occasions in daytime, but the source of this low-frequency exceedance noise is not necessarily from the Cement Plant and is considered more likely to be from road traffic diesel vehicle noise. Night-time and evening exceedances are mostly only occurring at 72 Taylor Avenue.

Low frequency was also assessed at the Store Yard monitoring location although this is not a residential receiver location. Low-level exceedances of the low-frequency criteria were mainly in the 80 to 160 Hz region, typically related to diesel truck noise. These could be internal trucks close to the meter. At higher exceedances, the 40 Hz band is the main source with some in the 50 Hz band also, but the sources of these frequency bands is not known. They are not seen to be as significant in the residential receiver locations.

Site noise sources

Some sources of noise at the Cement Plant had increased sound levels from previous measurements. Recommendations for review of plant item performance or maintenance were made for the following:

For No.6 Kiln

- PHT Level 2.5 - A review of the condition of FA63 and its discharge silencer for 63 Hz band sound levels.
- The new kiln shell cooling fans have significantly increased the sound levels at locations on the northern side of the centre of Kiln 6. A review of alternatives for cooling of this area is recommended from a long-term aspect.
- Sound levels have increased by 7 dB in the grate cooler fan courtyard. The maintenance condition of the fans and their inlet silencers in this area – FA201 to 207, is recommended for review to identify if there is a reason for this increase.
- .

For the No.7 Cement Mill and Cement Mill No.6:

- Cement Mill No.6 western wall fans discharge silencer.
- Cement Mill No.5 building FA502 and northern wall annex fan (DC702) fan discharges.
- Openings at the bottom of all main roller doors be able to seal to ground, not left open 50 to 100mm

- Openings of all smaller doorways be cleaned so they can close fully.
- Cement Mill No.6 - edges of the main northern wall doors have edge seals installed.

It is recommended that these items be reviewed for condition and silencers cleaned, replaced or installed if appropriate.

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

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
PHT Level 8	PHT L8 Top platform level with top of stack	202	37	42	45	45	50	51	59	62	70	66	61	64	69	63	61	65	62	62	63	60	58	55	52	51	51	45	38	32
	PHT L8 Top platform EL16 Gbox @ 1m to coupling NW side	203	39	44	47	48	52	53	56	59	64	65	62	67	73	66	65	68	66	67	67	66	65	63	61	63	64	59	53	49
	PHT L8 Top platform EL16 Gbox @ 1m to coupling SW side	204	38	44	48	49	51	52	55	59	67	64	62	64	69	66	65	67	67	67	70	67	63	61	59	59	61	54	47	43
	PHT L8 Top platform EL16 Gbox @ 2m to motor S side	205	41	44	48	47	50	53	57	61	71	66	58	63	73	64	61	64	62	63	65	61	60	58	56	56	58	53	49	44
	PHT L8 Top platform EL16 Gbox @ 1m to NE side	206	40	44	48	50	50	51	59	62	65	62	61	64	72	61	63	74	64	67	67	63	62	57	54	52	50	46	42	39
	PHT L8 Lower platform	207	33	40	46	45	48	52	59	63	69	64	59	61	65	60	59	61	57	57	59	54	51	49	47	47	48	43	36	30
	PHT L8 Top platform EL16 Gbox @ 3m to N side	208	30	39	44	47	46	52	59	61	67	63	60	60	66	60	60	71	59	61	59	58	56	53	50	50	49	44	39	35
	PHT L8 proper FA263 motor & casing @ 1m	209	38	45	44	46	45	49	54	60	67	75	67	67	67	74	73	85	73	73	83	72	69	67	65	63	61	59	54	49
	PHT L8 proper 1m to vent on FA263 filter room	210	35	43	45	49	47	50	55	56	63	72	64	62	61	63	65	70	61	63	69	63	58	56	54	50	46	42	36	30
	PHT L8 centre tower W side	211	33	36	43	44	44	49	52	64	64	65	60	63	61	61	61	63	62	61	61	58	55	54	51	44	43	37	33	24
	L8 new PHT centre	212	31	36	41	41	42	47	50	58	64	59	58	60	61	60	62	63	62	61	62	57	55	54	50	43	41	35	31	22
	PHT L8 centre tower N side	213	34	39	38	42	44	49	54	59	61	60	60	61	62	63	63	63	61	60	60	56	54	51	47	41	36	30	26	17
	PHT L8 centre tower E side	214	35	38	37	40	44	45	52	57	61	58	59	61	61	61	61	62	63	61	61	57	55	53	49	42	40	33	28	19
	PHT L8 centre tower S side	215	35	38	41	40	41	43	48	52	56	53	54	55	54	54	54	56	56	57	57	57	53	53	53	49	40	41	35	27
PHT Level 7	PHT L7 New S side centre	216	31	37	38	41	41	41	48	54	57	55	57	60	59	58	60	61	59	58	59	54	51	49	46	42	40	37	36	28
	PHT L7 New E side centre	217	29	36	36	40	42	44	51	56	58	56	59	60	62	61	62	62	60	60	61	56	53	51	47	42	38	32	42	24
	PHT L7 New N side centre	218	30	43	41	42	42	45	51	58	62	58	59	62	61	62	63	62	61	60	59	56	54	51	47	43	37	31	35	20
	PHT L7 New E side 4m to base of Alt Fuel chute, 1m to bin W	219	33	41	40	43	42	45	52	57	61	56	58	61	62	62	62	62	60	59	58	55	52	49	46	41	36	30	38	21
PHT L7 Alt Fuels Platform L1	PHT L7 Alt Fuels Platform L1: E side of feeder @ 1m	220	26	37	37	41	42	47	53	55	57	57	59	61	62	61	62	64	63	61	61	57	54	52	48	44	40	34	45	26
	PHT L7 Alt Fuels Platform L1: E side of mixer @ 1m	221	27	36	38	42	44	47	52	56	59	56	60	64	62	62	64	63	62	61	60	57	54	51	47	43	37	32	41	24
	PHT L7 Alt Fuels Platform L2: N side of conveyor discharge	222	33	43	40	43	41	48	57	60	59	59	62	63	64	64	64	64	63	62	61	57	54	52	50	49	47	43	55	36
	PHT L7 Alt Fuels Platform L2: 1m E side of chute inlet	223	30	39	38	40	44	49	54	57	57	58	60	61	62	63	63	63	62	62	61	58	55	53	49	46	42	38	48	30
	PHT L7 Alt Fuels Platform L2: 1m E side of conveyor 3m from entry to chute	224	28	33	36	39	43	49	55	58	60	56	60	60	63	62	63	62	62	60	61	57	55	52	48	43	37	32	35	20
	PHT L7 Alt Fuels Platform L2: 1m NW side of conveyor drive motor	225	34	40	37	40	42	46	53	59	63	58	61	62	62	63	63	63	62	61	60	57	54	52	51	52	50	47	61	43
	PHT L7 Alt Fuels Platform L2: 1m SW side of conveyor drive gearbox	226	33	39	39	41	42	45	55	59	60	57	60	62	62	62	62	62	61	60	60	57	55	52	51	53	52	47	58	40
PHT Level 7	PHT L7 New centre between towers faces S	227	35	40	41	46	42	44	52	57	64	60	58	62	60	60	61	65	60	59	60	55	53	50	47	42	39	33	37	23
	L7 between PHTs centre facing W	228	35	40	41	45	42	46	53	58	64	59	58	62	61	61	61	64	60	59	60	55	53	50	47	42	38	33	36	22
	PHT L7 Old S side centre	229	36	40	43	46	42	46	53	59	65	62	59	62	62	64	63	66	61	61	63	57	56	53	50	46	42	37	32	25
	PHT L7 under EL13 platform E side	230	40	45	47	49	50	53	54	55	68	62	60	65	62	63	63	65	63	61	62	58	57	57	54	50	47	38	34	30
	EL13 platform E side Gbox & coupling @ 0.5m	231	37	41	45	48	48	50	56	58	68	69	65	75	70	73	71	72	74	72	71	69	66	63	60	57	54	50	46	41
	EL13 platform N side GB end & side EL @ 1m	232	36	41	46	48	49	50	52	57	71	63	61	68	62	66	67	68	64	64	66	61	61	56	54	50	45	41	36	30
	L7 BE drive platform N side @ 1m to BE	233	36	39	44	46	48	50	56	59	69	61	60	63	61	60	61	64	61	59	60	56	56	52	48	45	40	35	30	23
	EL13 platform SW side motor & EL & coupling @ 1m	234	36	39	44	47	50	50	55	63	73	63	63	69	69	74	71	72	71	69	68	64	65	62	59	56	52	49	44	39
	EL13 platform W side 0.5m	235	34	37	42	49	48	50	56	62	76	61	57	62	62	65	61	63	60	62	60	56	54	52	51	50	44	38	33	27
	EL13 platform motor end @ 0.6m	236	38	42	45	49	51	49	57	61	72	65	65	73	74	76	76	77	76	74	71	67	66	66	65	62	58	57	53	49
	L7 centre between cylinders	237	41	44	44	46	42	46	53	58	67	62	60	62	60	61	61	64	59	60	62	57	54	51	49	45	41	37	33	25
	PHT L7 old NW corner 1.5m to stack	238	37	42	47	47	42	47	55	61	67	59	60	62	61	59	57	57	55	55	55	52	49	46	44	42	37	31	25	19
	PHT L7 old centre N side	239	40	44	44	43	43	48	57	66	69	61	59	61	61	60	58	58	57	57	57	54	51	49	46	43	39	35	31	25
	PHT L7 old centre N side on new platform	240	37	42	44	45	45	50	56	60	68	58	58	57	57	57	56	55	55	55	55	51	48	45	42	39	35	31	27	21
	PHT Level 7: FA213 @ 1m, door open	241	34	42	44	50	49	50	56	61	69	64	68	67	72	68	71	68	68	72	72	69	67	64	61	58	55	51	48	43

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
PHT Level 6 RM Silo Top	PHT L6 RM silo above baghouse discharge @ 2m at base of stairs to EL	242	35	41	45	55	56	53	59	58	64	64	67	68	69	66	72	71	71	68	67	60	57	55	53	50	46	42	36	29
	PHT L6 RM silo Top FA260 NE side @ 1m casing & motor	243	32	38	40	50	56	51	61	63	68	71	72	73	71	75	77	80	72	75	80	72	71	66	65	62	64	59	54	49
	PHT L6 RM Silo top EL15 platform motor side 0.6m	244	32	38	41	49	56	53	60	61	65	65	63	70	71	68	70	72	69	69	70	64	61	60	58	55	52	49	45	38
	EL15 W side @ 1m	245	31	36	40	48	55	53	56	57	61	60	59	63	64	60	62	64	61	59	61	55	52	50	47	44	40	36	32	27
	L6 RM silo top on BE EL15 platform SW side @ 0.8m	246	31	36	42	47	53	52	56	54	59	55	57	59	60	57	58	62	59	57	58	54	52	49	46	43	40	36	34	28
	EL15 S side Gbox @ 1m	247	31	36	41	50	55	52	56	57	64	58	61	61	73	63	62	71	65	62	61	61	56	53	51	47	44	41	36	30
	EL15 E side Gbox @ 0.5m	248	34	39	42	50	54	52	59	57	60	59	60	62	73	65	68	76	67	64	64	61	58	56	54	50	47	44	40	34
	RM silo top baghouse fan DC30 discharge @ 1.5m	249	35	44	46	60	64	58	67	70	74	74	72	78	74	70	77	77	78	76	79	71	68	66	63	61	57	52	47	39
	RM Silo top E side 12.7m to FA260	250	31	37	41	43	47	47	53	56	66	62	59	61	62	61	64	64	62	61	68	57	55	52	49	45	44	39	34	28
	RM Silo top N side 12.7m to FA260	251	29	36	40	47	47	45	55	57	66	58	61	65	64	61	64	64	62	60	62	56	54	52	49	45	43	38	33	27
PHT Level 6	PHT L6 centre W side	252	33	35	38	42	45	45	52	58	62	58	59	66	62	62	64	64	64	60	59	57	55	52	52	48	45	41	36	32
	PHT L6 stack test port 100mm diam @ 200mm	253	42	45	48	52	56	60	63	70	73	72	74	84	74	75	72	70	76	76	70	69	68	64	62	58	55	54	49	44
	PHT L6 stack test port 100mm diam @ 200mm	254	41	44	47	49	51	60	62	68	73	72	74	85	74	75	72	70	76	76	70	70	68	64	62	58	55	54	48	42
	PHT L6 NW corner 1m to stack	255	35	39	40	43	46	48	50	58	64	63	63	73	69	66	64	65	65	62	61	62	60	56	56	59	50	45	40	33
	PHT L6 centre N side by platform	256	29	39	38	45	44	46	48	55	60	58	59	63	62	63	63	64	62	61	59	57	55	52	51	47	42	39	34	29
	PHT L6 centre N side on platform	257	33	40	40	42	44	47	50	56	60	57	59	62	64	63	64	64	63	61	59	57	54	52	48	45	40	36	32	27
	PHT L6 centre between towers	258	30	36	35	39	43	45	48	55	57	57	58	63	62	63	63	64	62	60	60	56	54	52	49	49	49	49	47	42
	PHT L6 new N side centre	259	34	36	36	45	46	46	49	57	59	58	60	62	64	64	65	65	63	62	60	58	56	53	49	46	41	38	33	25
	PHT L6 new E side centre	260	33	32	33	40	43	47	50	55	59	56	58	62	63	63	64	65	63	61	60	57	56	52	49	45	43	40	36	30
	PHT L6 new S side centre	261	31	34	35	43	45	48	53	58	60	57	61	63	63	63	63	64	63	62	62	60	60	58	57	55	53	50	46	40
PHT Level 6 Inside Silo Top	L6 centre S side old PHT by elevator	262	28	34	38	43	45	46	51	55	60	56	58	62	62	63	64	64	62	60	61	57	56	53	55	51	47	45	38	34
	L6 inside doorway to top RM silo room	263	36	43	44	50	53	54	61	60	64	65	64	70	71	75	74	72	67	65	63	60	58	56	54	49	46	47	35	29
	RM Silo top inside centre	264	31	36	48	54	57	55	64	64	66	70	67	74	73	76	70	71	70	68	68	66	64	63	60	56	54	57	45	39
	RM silo top inside E doors open	265	30	39	46	53	56	53	64	64	67	69	67	72	70	73	70	69	68	67	66	64	63	62	59	54	54	60	41	34
	L6 RM silo top room inside S man door	266	35	42	48	57	56	52	60	63	65	67	68	74	72	73	70	70	68	69	66	65	66	63	61	58	55	55	51	43
PHT Level 5	RM silo top outside S man door	267	32	36	40	47	50	49	54	56	59	58	59	62	61	61	68	66	60	61	61	59	57	54	52	48	44	39	34	27
	PHT Level 5 old centre S side by stairs	268	33	34	39	41	45	48	50	54	60	57	58	63	64	63	66	66	64	63	62	61	60	58	59	56	55	50	46	40
	PHT Level 5 old centre W side by gas valves @ 1m	269	34	38	39	41	43	44	49	57	62	59	60	64	62	62	66	65	66	66	64	64	69	68	73	70	70	63	62	57
	PHT Level 5 old NW corner @ 1m to stack	270	38	37	40	43	47	46	48	58	62	60	60	65	63	62	63	64	64	62	62	60	60	56	59	55	54	47	45	38
	PHT Level 5 old centre N side	271	34	36	38	42	45	48	53	58	62	59	60	64	63	64	65	65	64	63	62	59	57	54	57	53	49	46	40	36
	PHT Level 5 centre between towers	272	31	32	35	41	43	46	49	55	58	56	58	62	63	63	64	64	63	62	61	58	57	55	53	50	49	47	41	35
	PHT Level 5 New centre N side	273	31	32	36	43	45	48	51	58	60	57	59	63	64	64	65	65	65	63	62	60	57	54	51	48	47	46	43	40
	PHT Level 5 New centre E side above kiln	274	30	32	35	40	44	48	51	58	60	58	59	62	63	64	66	66	64	63	62	60	57	54	51	48	49	46	44	40
	PHT Level 5 New centre S side	275	30	32	35	40	44	46	52	55	58	55	59	61	62	62	62	62	62	60	60	58	56	54	53	55	60	57	57	55
PHT Level 4	PHT Level 4 old centre S side by stairs	276	35	36	39	43	58	54	50	56	59	60	61	66	67	68	69	69	69	70	71	73	72	71	71	70	69	67	65	61
	PHT Level 4 old SW corner by water pumps SV09 @ 1m N	277	35	38	40	44	55	52	51	56	60	61	61	65	66	66	70	70	72	71	70	70	69	68	67	66	63	61	56	51
	PHT Level 4 old centre W side	278	38	42	44	43	48	49	51	58	64	63	60	65	65	64	68	67	69	68	67	65	63	61	59	56	52	48	43	37
	PHT Level 4 old NW corner @ 1.2m to stack	279	39	42	43	45	48	49	50	59	65	62	60	65	65	63	64	64	65	64	62	60	58	55	53	50	46	43	36	29
	PHT Level 4 old centre N side	280	34	38	39	41	46	50	51	60	63	59	60	64	64	64	65	65	65	64	64	63	61	60	60	58	56	53	49	44
	PHT Level 4 centre between towers by air cannon @ 2m	281	36	38	39	41	51	48	54	59	62	60	64	67	66	66	67	67	67	66	64	63	61	57	55	52	50	51	44	39
	PHT Level 4 new centre N side	282	32	35	36	42	47	48	53	59	61	59	61	64	65	65	66	66	66	64	63	61	58	56	53	49	46	46	37	31
	PHT Level 4 new centre E side above kiln	283	33	36	35	41	46	48	52	59	61	58	61	64	64	64	65	65	64	63	62	60	58	55	52	51	48	50	40	34
	PHT Level 4 new centre S side	284	31	33	37	42	51	48	51	57	59	57																		

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
ESP	ESP Centre E side top walkway looking E to PHT	285	36	39	40	41	48	47	50	56	62	61	58	60	64	63	64	69	64	64	66	61	60	57	55	52	49	44	38	30
	ESP top SE corner at barrier	286	35	37	39	40	49	48	51	57	59	60	58	60	63	63	64	70	64	63	65	62	61	59	57	54	51	46	41	36
	ESP top SE corner at barrier - facing ESP	287	34	38	39	40	45	46	49	55	58	57	57	60	61	60	63	65	61	61	61	59	56	53	52	49	46	42	37	32
	ESP top centre E side S platform facing PHT	288	34	36	40	40	51	49	50	57	60	60	59	60	62	63	68	69	64	63	64	62	60	57	56	53	49	45	39	34
	ESP top NE corner at barrier	289	35	36	40	41	54	50	52	57	63	64	59	60	61	62	64	65	63	62	61	59	56	54	53	50	46	43	36	32
	ESP top NE corner at barrier - facing west	290	34	36	39	40	48	48	51	56	61	60	58	60	60	60	62	61	60	60	60	57	55	52	50	47	42	38	30	25
PHT Level 3	L3 old PHT centre S side @ 2m to edge facing centre	291	34	40	46	47	58	54	55	59	62	62	62	66	69	69	69	71	71	68	66	65	63	62	60	58	55	53	50	47
	PHT Level 3 old centre W side above FA39	292	35	42	49	47	59	56	57	62	66	65	64	69	68	68	68	69	68	68	66	64	62	60	59	56	53	49	45	40
	PHT Level 3 old centre N side	293	38	45	44	45	57	54	54	61	66	66	64	68	68	68	68	68	68	67	65	63	60	58	55	52	49	46	42	38
	PHT Level 3 old centre E side above kiln	294	33	41	47	46	51	53	56	63	65	65	66	69	69	69	70	70	69	68	67	65	63	60	57	55	52	51	49	46
	PHT Level 3 old NW corner by stack @ 1.5m, above FA39 inlet	295	40	45	52	50	55	56	58	61	66	68	68	71	69	69	69	70	69	69	67	65	63	61	60	57	54	51	45	37
PHT Level 2	PHT Level 2.5 by DC31 drives @ 0.6m	296	52	49	59	59	71	70	70	74	75	74	73	76	80	81	76	77	77	75	74	72	71	69	68	66	63	62	57	50
	PHT Level 2.5 by DC31 discharge @ 1m	297	54	52	55	60	75	70	69	71	79	75	73	78	78	78	76	77	77	77	76	74	71	71	69	67	64	61	56	49
	PHT Level 2.25 by centre by kiln entry	298	48	47	54	50	61	60	61	63	68	70	67	71	74	73	76	74	80	75	75	76	76	78	76	76	75	74	70	67
	PHT Level 2.25 North Side centre	299	45	45	49	51	69	64	59	64	69	70	68	70	72	72	71	71	73	72	70	70	70	72	71	71	70	67	64	61
	PHT Level 2.25 by Radicon Gbox drive E end @ 2.5m	300	41	44	48	51	64	60	60	65	68	67	66	72	76	78	78	77	83	77	74	74	71	71	68	66	63	59	55	49
	L2.25 PHT centre W side facing fan discharge DC70 FA63 @ 4.66m, stack @ 6.35m and stack entry duct @ 6.23m	301	42	46	52	56	80	74	67	68	70	71	68	75	77	77	79	77	79	76	74	73	73	72	72	70	68	66	62	55
	L2 PHT FA03 casing @ 1m E side	303	45	49	54	53	65	61	63	68	72	71	68	73	75	75	76	73	76	75	71	70	70	68	66	63	60	58	55	48
	PHT Level 2 by E side drive coupling & casing DC70 FA63 centre N side	302	45	49	55	51	62	60	65	67	72	70	69	72	76	77	76	74	77	75	73	71	70	69	67	65	63	62	60	53
	PHT Level 2 FA63 discharge @ 1.5m	305	48	51	55	57	79	74	72	71	77	73	72	75	78	78	78	77	79	78	77	75	74	73	72	70	68	66	62	56
	PHT Level 2 @ 1m to south side FA39 stack entry duct	306	50	54	58	57	75	69	64	70	78	76	73	73	76	75	76	77	78	76	74	73	71	69	67	65	62	58	54	46
	PHT Level 2 FA65 inlet filter @ 1m in front	307	44	51	55	58	72	67	64	72	73	73	73	74	78	79	77	77	79	76	73	72	70	69	68	64	60	56	51	44
	PHT Level 2 FA65 rear side 1m	308	43	48	52	58	78	72	65	67	74	73	69	72	78	76	77	76	78	75	72	71	68	67	65	62	57	55	51	45
	L2 PHT centre N side edge @ 2m facing centre	304	41	45	48	50	68	63	61	67	70	67	68	71	73	74	72	72	74	73	69	68	66	64	62	60	56	52	50	50
	PHT Level 2 @ 1m to north side FA39 stack entry duct	309	50	52	55	53	68	64	64	69	78	77	72	73	75	74	73	74	75	75	73	71	70	66	63	59	55	50	46	39
PHT Level 1	PHT Level 1 RM silo base blower room N side man door @ 1m	310	42	43	47	51	60	55	63	69	66	70	64	68	70	69	73	70	71	70	68	68	65	65	65	65	64	61	57	54
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m NW side	311	52	48	48	56	54	54	68	66	66	66	67	71	72	71	74	73	72	72	69	68	67	66	66	65	63	58	54	51
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m E side	312	48	42	46	49	55	55	69	67	64	67	68	71	73	73	73	72	72	72	69	69	66	64	63	64	60	56	52	48
	PHT Level 1 FA92 silo vent fan inlet duct @ 1m SE side	313	48	44	47	53	53	55	61	62	64	64	66	69	71	70	71	71	70	70	68	67	65	62	60	57	56	50	44	38
	PHT Level 1 FA92 silo vent fan inlet front @ 1m	314	48	42	48	55	60	62	71	68	66	66	66	67	68	69	71	69	68	69	68	64	62	60	57	54	51	48	43	36

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
FA39	FA39 E side at concrete line 5.4m to motor	315	40	45	52	52	59	57	60	64	73	69	68	69	69	73	70	74	73	76	73	69	70	66	63	60	55	51	47	42
	FA39 E side @2.3m in line with columns	316	44	48	55	53	62	57	59	63	69	68	75	69	69	70	72	75	73	78	74	71	71	67	64	61	56	51	46	40
	FA39 under discharge duct @ 1m	317	47	54	60	59	64	60	63	67	72	71	67	70	70	71	73	80	71	73	77	70	71	67	63	61	54	50	47	42
	FA39 E side motor platform @ 0.82m to coupling cover	318	46	48	57	54	61	58	64	65	70	70	80	77	74	79	78	80	82	83	83	81	79	77	75	72	68	64	60	54
	FA39 motor platform centre E side@ 1m	319	44	47	51	59	58	57	65	63	72	72	76	72	72	77	76	79	81	86	78	77	77	74	73	71	63	59	53	47
	FA39 motor N end @ 2.7 to end plates/stop button	320	41	44	51	51	59	55	56	61	66	65	71	66	67	68	68	71	68	71	68	66	65	62	61	57	50	46	40	33
	FA 39 N side on kerb	321	37	40	48	51	52	54	59	61	66	64	66	66	67	66	69	72	68	69	68	65	65	61	59	55	49	44	37	30
	FA39 W side at metal strip 5.25m to motor	322	43	44	48	48	57	56	58	62	67	66	75	69	69	69	71	77	73	77	76	71	72	68	67	62	56	51	46	39
	FA39 W side at columns @2.7m to plinth	323	44	45	50	50	57	54	58	60	66	68	82	68	69	71	71	76	74	83	77	73	71	69	67	64	57	53	48	42
	FA39 W side motor platform at 0.8m to couling cover & 1m to coupling	324	44	48	58	54	60	58	65	64	70	71	84	73	73	79	79	78	80	82	79	77	76	73	73	69	65	60	56	51
	FA39 W side @ 1m to cladding door open, 1.33m to casing	325	44	50	56	55	61	57	58	67	78	73	77	68	69	69	71	78	73	75	78	70	71	68	64	60	56	54	49	43
	FA39 S side @ columns 2.7m to bearing	326	43	46	54	54	64	59	58	62	68	67	69	70	73	71	74	82	72	75	81	74	75	71	66	62	58	53	49	41
	FA39 S side platform bearing cover @ 0.8m	327	43	48	54	55	62	63	61	62	69	69	67	72	75	74	77	84	73	75	81	74	73	71	66	63	60	55	50	44
	Centre between FA38 & FA39 @ 11.2m facing E	328	42	43	46	50	54	54	55	60	65	63	67	66	68	69	71	76	72	79	74	69	68	65	63	59	54	50	44	37
FA38	Centre between FA38 & FA39 @ 7.7 m facing FA 38	329	42	43	46	50	53	53	57	61	65	63	66	67	67	70	74	72	72	75	69	67	65	62	60	56	52	48	43	37
	FA38 @ 3.9m to E side	330	40	45	46	52	54	54	56	61	65	65	71	66	66	68	73	70	74	78	69	66	65	62	59	56	53	49	44	39
	FA38 @ 3m to N side	331	40	46	47	49	55	53	55	60	65	65	69	66	66	68	72	69	74	78	68	66	65	62	59	56	52	47	41	34
	FA38 @ 5m to NW side at NW column	332	37	44	47	50	53	57	57	59	64	64	68	65	66	67	72	70	74	77	68	66	65	63	60	57	53	48	43	37
	FA38 @ 5m to NW side at W column	333	37	42	47	49	53	56	56	61	63	64	67	64	67	68	69	74	73	74	71	67	65	63	61	58	55	51	47	42
	In centre opening of wall on W side	334	38	42	45	47	56	54	56	58	62	62	65	64	66	67	69	74	74	74	70	68	67	65	62	59	54	50	44	37
	FA38 motor platform W side @ 1m to couling cover, 1.9m to casing, 0.7m to motor side	335	39	44	48	51	58	55	59	59	63	66	64	68	69	68	71	73	79	86	75	71	69	68	67	67	65	62	59	55
	FA38 at opening on S side of road facing FA38 opening	336	35	41	43	47	52	52	53	58	61	62	59	64	67	65	70	71	67	69	67	65	63	63	60	57	53	50	44	37
	56' Road kerb N side opp. Opening to FA38	337	36	39	43	47	49	50	53	59	62	61	62	63	64	63	66	67	65	66	63	61	59	58	55	52	49	45	39	32
	57 Road N side opp FA38 doorway	338	38	40	41	47	54	52	54	59	62	62	67	66	66	64	67	67	66	69	63	61	59	57	53	50	46	41	34	25
	58 Road N side between FA38 & FA39	339	37	43	45	50	52	53	55	60	64	63	65	65	65	66	67	67	67	68	64	62	61	57	55	51	45	39	32	24
RM6	1 RM6 W door @ 1m	340	29	33	38	40	41	43	47	52	57	62	60	62	66	62	72	74	67	66	65	62	61	60	57	52	46	39	32	22
	1' RM6 W door at kerb W side @ 13.3m	341	27	34	35	39	42	43	47	50	54	55	53	59	63	57	62	64	58	58	58	55	54	51	47	43	37	32	24	17
RM7	1 RM7 at roadside kerb ~32m	474	28	31	39	40	47	48	46	48	56	58	53	54	58	56	57	56	55	56	55	55	53	52	49	45	41	34	26	17
	2 Rm7 @ 15.5m to W door	475	28	32	40	41	47	53	49	53	62	63	57	58	62	60	62	61	61	61	60	59	57	54	51	47	42	36	27	
	3 RM7 W wall door @ 1m	476	30	35	45	42	44	52	52	54	63	64	64	65	68	68	69	69	68	67	67	67	65	64	62	58	53	48	40	31
	4 RM7 NE corner wall vents 2 1m	477	33	37	46	44	48	57	55	58	68	66	64	65	69	69	69	71	68	69	69	68	67	65	62	58	53	48	42	35
	5 RM7 N side NW roll door @ 1m	478	38	41	51	47	52	54	55	61	70	64	66	65	70	68	72	68	68	68	67	66	65	64	62	58	54	49	42	34
	6 RM7 N wall vents centre next to Roll door	479	36	40	50	48	51	53	57	60	68	67	66	67	73	71	73	72	71	71	72	71	70	68	65	62	57	51	46	40
	RM7 vents N wall W of man door	480	36	43	54	52	50	53	56	61	69	67	65	66	73	72	77	71	70	72	71	70	69	69	65	62	58	54	49	43
	7 RM7 N wall man door	481	36	42	51	50	54	53	61	60	65	65	63	65	71	69	73	69	68	70	69	68	67	66	63	59	55	51	45	38
	8 RM7 E wall vents NE corner @ 1m	482	33	39	47	50	55	54	55	61	68	67	66	66	71	70	78	71	70	73	71	71	69	68	65	61	57	52	47	39
	9 RM7 E side under duct	483	35	41	43	49	51	53	55	58	64	66	63	64	67	68	78	69	67	69	67	66	64	63	61	57	53	49	42	35
	10 RM7 By E door RM7 floor	484	34	39	43	49	55	53	54	57	63	64	62	62	65	65	73	67	65	66	65	64	62	61	59	55	51	49	42	34
	10 RM7 By E door Hydraulics room open	485	34	34	41	45	48	49	50	52	58	57	57</																	

Table 3.2 Kiln 6 Upgrade Frequency p.4

Table 3_2

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
FA249	13 FA249 under inlet duct W side	491	39	41	49	53	56	54	59	70	63	62	66	63	65	67	79	66	64	69	65	64	63	60	58	54	51	48	42	34
	14 FA249 2m W side ground level	492	40	40	45	50	52	53	61	74	65	67	77	66	68	71	81	70	67	71	67	67	66	63	61	57	54	51	45	37
	14' FA249 motor platform fan coupling & casing W side @ 1m	493	38	40	48	54	54	56	59	64	67	69	71	66	67	69	78	69	70	72	69	70	66	65	66	61	58	56	52	48
	15 FA249 1m motor end	494	33	38	45	52	54	54	63	76	62	65	71	66	68	71	80	69	70	72	70	69	67	64	64	60	57	54	49	44
	16 FA249 end at column 4.3m N of motor plinth	495	37	38	46	53	60	56	62	74	63	66	69	65	67	72	82	69	67	74	67	68	66	63	62	58	54	51	46	38
	17 FA249 motor platform E side coupling & casing 1m	496	37	39	51	55	53	54	58	68	64	67	71	65	68	69	79	69	69	71	69	69	66	65	66	61	59	56	53	49
	18 FA249 Platform S side centre @ 1m	497	33	38	49	48	48	48	53	59	61	58	60	58	60	61	67	61	61	61	61	59	60	60	61	62	64	62	59	57
	18' FA249 platform S side under discharge duct E side	498	34	37	46	49	49	48	53	63	64	59	63	60	62	66	73	63	63	65	67	66	62	58	57	54	52	48	44	37
	19 FA249 S side @ 3.8m	499	33	36	42	44	46	47	52	59	58	59	62	58	59	60	65	60	60	61	59	58	57	54	52	49	47	46	42	38
	19 FA249 S side @ 5.5m	500	33	35	41	44	48	49	53	63	58	59	60	59	60	63	69	60	60	62	60	59	57	55	53	49	48	46	42	38
	20 FA 249 S side @ 10.9m	501	31	35	41	44	50	50	55	66	59	59	64	60	62	63	71	62	61	61	60	59	57	56	53	49	47	44	39	34
	21 FA249 E side of fan casing ground level @ 2m	502	38	42	49	47	51	53	55	62	58	58	63	59	59	61	72	61	61	63	61	59	58	55	54	51	49	47	42	38
FA250	22 FA250 S side 4.2 m to motor end	503	40	39	48	52	58	56	59	70	64	68	74	66	70	73	84	70	69	74	69	70	69	66	65	61	58	54	49	43
	22' FA250 Motor end S side @ 1m	504	36	38	45	51	53	56	61	70	65	69	70	67	70	73	79	72	71	73	71	71	70	67	66	63	60	57	54	49
	23 FA250 E side platform coupling & casing	505	37	42	51	58	56	61	64	70	72	74	69	70	71	75	81	73	73	74	72	73	72	70	71	68	67	64	61	56
	23' FA250 E side centre motor @ 1m	506	37	41	49	56	55	60	63	67	69	73	69	68	70	72	76	72	71	74	71	73	71	69	70	66	64	62	58	52
	FA250 W side motor shaft @ casing @ 1m	507	40	43	52	61	60	60	61	67	72	76	73	69	71	75	78	75	74	75	73	74	74	72	73	70	68	66	63	57
	25 FA250 coupling & casing W side motor centre @1m	508	37	42	52	57	57	59	59	64	67	71	67	67	70	71	77	73	72	73	71	72	71	69	70	66	64	61	57	52
	26 FA250 W side casing @ 1m & coupling @ 3m	509	39	41	49	52	57	57	58	62	70	73	66	66	71	71	75	70	68	72	69	70	68	68	69	66	66	62	58	56
	27 FA250 W side 1m under inlet casing expansion joint	510	39	43	50	51	53	56	58	61	70	73	66	67	70	71	76	70	68	71	69	69	68	66	64	62	61	59	55	52
	28 FA250 N side casing shaft platform @ 1m	511	41	43	50	54	58	57	59	66	67	68	73	69	75	74	73	74	71	71	73	71	72	69	67	67	65	63	62	57
	29 FA250 E side under discharge duct @ 1.5m, at lower step of concrete	512	38	41	49	51	57	57	60	72	72	73	70	67	71	71	79	73	71	72	72	72	70	68	67	65	62	58	53	47
RM7 Roof Platform Lower	Lower platform E side 1m to Magnete plate	513	31	34	40	49	53	52	60	69	64	66	67	67	71	73	75	77	79	79	79	81	82	83	80	78	75	71	68	63
	Lower platform S side @ 1m to magnete plate	514	31	35	38	46	50	52	59	64	62	64	68	69	71	75	76	78	79	80	80	82	81	82	81	80	78	77	73	65
	Lower platform W side @ 0.9m to magnete plate	515	31	35	39	47	52	54	59	65	65	67	67	68	71	73	75	77	79	79	80	81	82	81	80	77	74	71	67	62
	Lower platform N side @ 1m to magnete plate	516	32	37	42	48	54	53	61	71	68	69	67	65	69	71	75	74	76	77	78	79	80	82	81	78	74	71	66	59
	Lower platform N side @ 1m to BE casing	517	33	37	41	49	53	50	60	71	66	67	64	66	67	70	73	70	72	73	73	74	75	78	77	74	72	67	61	56
	Platform S of Magnete 2m to S side	518	31	34	37	44	50	50	58	69	62	61	65	62	67	70	73	75	75	74	75	75	77	77	76	76	75	71	65	59
	Platform S of Magnete 2m to S side	519	30	34	38	44	49	50	55	59	61	61	64	63	68	71	73	76	76	75	76	76	77	78	76	77	76	72	65	59
	Lower platform N side @ 1m to BE casing	520	33	37	41	48	51	51	58	60	66	66	62	67	67	68	72	70	72	73	73	74	75	78	78	76	72	67	62	56
RM7 Roof Platform Upper	Upper Platform Gbox @ 1m E side & 0.5m casing	521	31	35	40	47	54	54	60	71	62	64	72	64	67	71	70	68	69	69	69	70	70	72	69	66	62	58	53	48
	Upper Platform Gbox @ 1m N side	522	31	35	41	50	54	55	63	72	66	68	70	64	66	69	70	69	70	70	70	70	71	72	71	70	65	60	54	49
	Upper Platform motor end @ 1m W side	523	30	35	40	47	54	52	63	73	63	65	72	64	67	67	69	70	68	69	71	71	72	73	70	67	65	62	58	54
	Upper Platform BE casing @ 0.9m W side	524	31	35	40	47	55	54	63	72	61	63	66	63	65	66	68	69	69	71	70	71	72	72	69	67	64	61	57	52
	Upper Platform BE casing @ 1m S side	525	34	37	42	50	56	53	59	64	63	63	63	63	67	69	73	72	72	73	74	75	77	77	76	73	71	70	65	59
	Upper Platform BE casing @ 1m E side	526	29	35	41	47	55	55	61	72	65	67	67	64	67	69	71	70	69	70	70	70	71	73	71	67	63	60	54	48
RM7 Baghouse Tower	On tower to baghouse top S side above FA249 same level as roof RM7	527	27	34	40	46	50	47	49	59	60	58	61	58	60	61	65	62	60	61	58	58	56	54	56	51	46	42	38	30
	On tower to baghouse top S side above FA249 top level	528	29	33	38	41	44	45	47	51	55	56	55	59	57	57	61	58	58	58	57	56	56	55	55	53	50	49	44	40
	Baghouse S doorway open	529	31	34	39	43	46	48	49	53	61	58	58	59	61	62	67	65	65	67	67	69	71	71	73	73	70	69	66	62
	Inside centre baghouse top	530	30	31	41	44	47	46	48	53	59	60	60	61	63	63	66	66	67	68	69	72	73	75	76	75	73	72	68	64

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
RM7 Inside	Top floor E open doorway	531	30	36	42	46	50	56	56	60	65	67	66	69	72	72	77	77	74	74	74	74	74	73	71	68	64	59	53	46
	Centre top 2m N of BE casing	532	37	40	41	46	47	53	56	63	67	69	70	71	76	75	78	78	77	78	78	78	78	77	75	72	68	64	59	52
	Top level 1m E side entry of conveyor to chute	533	37	40	44	47	51	55	61	66	68	70	72	73	76	77	80	81	81	82	81	81	82	81	80	77	74	71	67	63
	Top level by top of RM7	534	36	42	45	47	48	53	58	63	68	71	74	74	77	78	81	84	81	81	82	82	81	81	78	76	73	68	64	59
	Top level W side of chute entry end of conveyor	535	35	40	43	48	51	56	59	62	68	72	75	75	78	79	81	82	81	81	82	83	83	83	80	78	75	71	67	61
	Top level W side of chute opening entry of conveyor	536	36	40	44	44	50	54	59	64	67	71	72	74	76	78	81	81	80	81	81	82	82	83	81	78	75	72	66	60
	Top level centre W side platform	537	32	39	44	46	49	53	57	62	68	70	71	72	78	77	80	80	79	79	79	79	79	79	76	73	69	64	59	53
	Top level in doorway of conveyor from RM6	538	34	38	44	46	49	54	57	61	68	70	69	69	74	75	77	76	76	76	76	76	76	75	73	70	67	63	58	53
	On conveyor walkway on centre from RM6 at centre light	539	31	35	46	44	51	58	55	59	70	65	66	65	69	70	70	66	66	66	65	65	65	64	63	60	57	51	45	38
	Level 3 2m N of BE casing	540	40	42	43	48	50	55	58	64	69	71	71	73	78	77	80	81	79	79	78	78	77	76	74	70	66	61	56	48
	Level 3 between chute & duct on top of Mill	541	37	43	47	49	51	56	59	65	69	74	76	75	80	80	83	83	83	83	83	83	83	81	80	80	76	70	66	60
	Level 2 2m N side of BE casing	542	40	44	44	46	51	54	61	70	68	70	73	74	77	78	82	82	80	79	79	79	78	77	74	71	66	61	56	49
	Level 2 1m N of cone top of Mill by entry door	543	37	42	46	53	54	55	60	69	70	72	74	75	78	79	82	83	82	82	83	82	82	81	79	77	75	71	68	62
	Level 1 2m N of BE casing is work bench	544	38	40	43	46	52	54	64	71	69	71	72	74	79	79	83	81	80	80	80	80	79	78	75	71	67	62	56	50
	Level 1 2m to RM7 body N side	545	37	42	45	48	54	60	62	72	70	73	75	76	79	80	83	83	82	82	82	82	82	81	78	75	72	68	64	58
	Level 1 2m W side of RM7 on platform	546	32	42	44	47	52	57	67	72	71	73	74	75	82	80	81	82	81	82	81	82	81	80	78	76	73	69	65	60
	L0 1m E side of feeder VF100 inlet chute & RM7 body	547	38	43	48	52	56	63	66	71	72	75	73	76	80	81	83	86	86	88	88	87	87	87	85	84	83	81	76	69
	L0 Ground Floor 3m N of BE casing	548	35	44	43	49	54	60	67	69	71	74	72	74	77	79	82	81	81	82	83	83	82	83	80	76	72	69	64	56
	L0 Inside man door N side	549	36	44	47	53	55	58	62	72	71	73	74	74	77	80	80	81	81	82	83	82	82	84	80	76	73	68	64	55
	L0 Inside W roll door @ 1m	550	34	40	42	49	58	53	60	68	71	76	75	75	79	80	80	80	80	80	80	80	79	79	76	72	68	63	57	50
	L0 Drive motor N @ 2m to N side & 3m to mill body	551	38	45	46	51	56	57	70	73	72	75	75	77	81	81	82	83	83	84	84	83	84	84	81	77	74	70	65	58
	L0 Drive motor S side @ 2m and RM7 body @ 2m	552	35	40	45	48	55	57	63	72	68	73	74	76	80	81	81	81	81	82	82	81	81	79	77	75	71	68	63	57
	L0 RM7 body S side @ 2m	553	37	44	46	46	52	50	62	69	68	73	72	74	78	79	80	81	81	81	81	81	80	79	78	75	72	68	63	57
	L0 NW corner 1.5m to roll door and vents	554	36	40	42	47	53	52	63	72	68	71	71	74	77	77	78	79	79	79	79	79	79	79	74	71	67	62	57	50
RM7 bag-house hop per	On screw conveyor SC212 platform Level 1 W end side by fan motor @ 1m	555	31	37	43	47	49	55	57	59	67	69	66	63	70	67	68	69	68	70	68	67	67	64	62	58	55	52	47	42
	Centre S side of screw in line with motor FA250	556	32	36	45	50	61	57	55	59	62	64	64	64	66	66	67	70	66	68	67	64	64	62	61	60	58	56	52	46
	E end of SC212 body @ 2m and other N-S aligned screw	557	34	37	48	48	58	54	54	64	69	68	64	63	66	67	66	67	66	67	68	64	63	61	60	58	56	55	50	42
	Main platform of baghouse hopper screws S end chute W side between SC211 & gate valve	558	29	36	43	47	51	52	55	59	66	63	63	64	66	66	68	68	66	69	67	67	65	63	61	58	56	55	48	44
	Centre W side	559	32	36	45	47	51	55	55	58	63	66	65	64	69	67	69	69	67	68	68	66	66	64	63	58	55	51	45	38
	Centre E side - on	560	33	37	45	46	54	55	54	60	64	66	63	65	68	67	69	71	67	69	69	67	65	64	63	59	56	52	46	38
	N end Sc211 but S of duct	561	36	37	44	50	52	55	55	57	68	67	64	64	70	68	68	70	67	68	68	67	66	64	70	59	56	50	44	37
	By FA252 @ 0.8m shaft S side, casing & discharge box	562	34	37	43	54	59	54	55	60	62	65	70	68	68	65	70	69	66	67	65	64	64	63	62	63	65	66	61	55
	By FA252 @ 0.8m shaft N side, casing & inlet	563	33	38	44	58	62	57	55	60	63	66	72	65	66	65	73	69	66	66	67	66	66	66	67	68	67	66	64	59
	Baghouse hopper platform level N end	564	39	38	44	46	53	54	54	58	63	64	62	63	69	68	69	70	67	66	68	66	66	63	63	59	55	51	46	40
	Baghouse hopper centre platform	566	39	38	41	47	52	53	54	58	63	63	61	66	68	68	67	68	65	65	67	66	65	63	63	58	55	51	45	38
	By FA252 @ 1m to side discharge box top grill	567	36	40	43	54	58	54	55	60	65	66	68	66	69	68	72	69	66	70	67	64	64	62	61	59	58	57	53	49

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
Kiln 6 South Coal Road South side	30 Coal Road S side in line W side RM7	568	23	28	32	36	42	45	48	51	58	56	53	55	55	56	54	54	53	57	54	51	49	47	44	39	35	30	24	17
	31 Coal Road S side in-line E side RM7	569	25	29	34	37	45	47	48	53	56	55	55	57	57	57	56	55	55	56	54	52	50	47	44	39	33	28	23	16
	32 Coal Road S side in-line FA249	570	29	32	37	40	46	49	50	56	56	54	56	60	59	59	58	58	58	58	57	55	53	50	47	43	39	34	27	19
	33 Coal Road S side Centre Blending Silo	571	30	33	38	41	50	49	51	56	56	54	56	60	60	59	59	59	59	59	58	56	54	51	48	44	39	33	27	19
	34 Coal Road S side E side PHT	572	28	32	37	41	48	49	51	56	58	55	55	60	58	58	59	60	60	59	58	57	57	56	55	53	49	45	39	32
	35 Coal Road S side E side new PHT	573	30	29	35	43	50	50	52	56	55	53	57	58	57	58	63	62	61	60	59	57	56	52	49	44	39	33	26	19
	35 Coal Road S side E side new PHT	573	29	31	36	41	49	49	51	58	57	55	58	60	59	59	60	60	60	59	58	55	54	50	47	42	37	31	23	16
	36 Coal Road S side E side drive platform	574	28	30	36	41	48	49	52	58	57	56	56	59	58	58	58	59	59	59	58	55	53	50	46	40	34	26	18	11
	36 Coal Road S side E side drive platform	574	30	30	36	43	49	50	53	56	56	55	56	58	59	60	63	64	62	61	61	59	57	54	50	46	39	34	27	21
	37 Coal Road S side centre column W support duct	575	31	35	38	42	46	48	51	56	57	55	58	60	57	57	59	59	58	58	58	55	53	50	46	41	36	29	23	16
	37 Coal Road S side centre column W support duct	575	31	30	34	40	46	48	53	57	56	53	58	59	57	57	61	61	60	60	58	57	55	51	47	43	37	32	24	20
	38 Coal Road S side centre pedestal	576	29	33	37	42	48	49	51	56	56	54	57	59	58	58	59	59	59	58	57	55	53	49	45	42	37	31	25	19
	38 Coal Road S side centre pedestal	576	28	31	35	40	45	48	54	56	57	53	58	60	58	57	60	60	60	59	58	56	54	51	48	44	39	34	25	20
	39 Coal Road S side Between centre & E pedestal	577	27	30	35	40	44	49	54	57	58	53	61	61	58	56	60	60	59	59	58	56	55	51	47	43	39	32	25	19
	39 Coal Road S side Between centre & E pedestal	577	27	31	36	40	46	48	51	57	56	54	60	61	58	57	59	58	59	59	58	55	53	49	46	41	34	27	19	12
	40 Coal Road S side E pedestal	578	27	30	33	39	45	48	50	55	57	54	61	60	58	57	59	59	59	59	58	55	54	50	47	42	37	31	25	19
	40 Coal Road S side E pedestal	578	27	30	35	38	46	48	49	55	57	55	59	59	58	58	59	57	59	58	57	55	52	49	45	39	33	26	20	13
	41 Coal Road S side W end Firing floor building	579	26	30	34	38	47	47	49	52	54	52	55	59	57	57	58	57	57	56	56	54	51	48	44	39	32	24	17	12
	41 Coal Road S side W end Firing floor building	579	27	33	35	40	45	47	51	54	53	52	58	60	57	56	59	58	58	58	57	56	54	50	47	43	38	33	28	22
	42 Coal Road S side opposite grate	580	26	28	34	37	42	46	49	54	55	52	56	59	57	57	57	57	58	57	57	55	52	49	48	47	43	41	35	29
	42 Coal Road S side opposite grate	580	27	31	33	37	42	46	50	53	55	50	56	58	57	56	57	59	59	58	58	55	54	50	47	42	38	35	30	20
	43 Coal Road S side W side coal receival bin 25m to truck	581	34	29	30	40	38	45	45	47	52	49	52	57	60	58	58	58	60	63	66	61	57	55	52	48	44	40	37	32
	43 Coal Road S side W side coal receival bin 25m to truck	581	26	29	31	35	39	39	42	46	48	46	48	55	54	52	53	52	51	50	50	48	46	43	39	34	28	24	18	13
	42' Coal Road N side opposite grate		28	32	33	39	44	47	51	54	56	53	57	60	58	57	59	59	59	58	58	56	54	51	48	44	38	31	24	18
K6 S side	43A Kerb E side CM opp CM fan discharge	404	28	39	41	47	45	47	54	53	55	56	59	69	67	66	73	68	62	60	61	59	58	56	53	49	45	39	33	25
	44A Under Coal Mill fan discharge	405	38	47	47	51	48	53	57	60	68	71	74	84	79	77	79	75	74	72	73	71	69	66	63	59	55	49	42	35
	44 CM fan room roll door @ 2m	406	40	48	49	51	51	55	60	63	68	69	70	76	76	75	77	73	73	71	71	70	68	66	62	58	53	47	40	35
	44 CM fan room roll door @ 2m	407	39	45	43	50	48	52	57	59	65	66	69	71	73	71	73	72	71	71	71	71	69	68	65	61	56	50	42	33
	44' CM S wall E door @1m,	408	36	45	44	50	52	53	58	61	67	69	71	75	75	75	76	77	78	77	77	78	77	76	74	73	69	63	56	45
	45 CM S roll door and wall vent @ 9.9m S side	409	33	39	41	47	49	52	57	58	61	63	63	70	69	69	69	68	68	68	69	70	68	67	65	62	59	53	46	36
	46 CM room wall vent @ 2m	410	40	40	43	49	55	56	62	61	64	66	68	72	73	73	74	73	73	73	75	74	72	70	68	66	61	55	48	37
	46A Coal Mill Room S roll door W @ 1m	411	37	39	42	49	50	54	58	59	60	63	67	72	74	73	74	74	73	73	75	74	70	69	65	62	57	52	45	37
	47B Centre between Grate & CM blower room roll door	412	40	41	42	53	55	58	62	65	67	69	78	75	76	74	79	77	75	76	76	73	71	68	65	61	57	51	44	38
	47A Centre between CM Room and grate	413	34	38	41	53	49	56	61	60	62	62	66	69	71	69	72	71	69	69	70	68	65	63	60	57	53	48	42	34
	47 Opp FA264 @ 8m	414	36	38	42	52	53	56	62	62	63	63	69	68	69	69	72	72	70	71	70	68	67	64	62	61	59	56	52	47
	47C Between FA264 & FA200	415	36	38	44	53	54	60	64	63	65	66	68	69	70	71	73	73	71	71	70	69	68	64	62	61	58	55	50	44
	47D FA 200 S Side @ 5m	416	34	38	44	51	55	61	64	66	66	67	72	72	73	73	73	74	72	71	70	70	71	67	63	60	59	55	49	43
	48 Opp. E pedestal roller	417	34	38	43	50	54	61	64	66	67	67	75	73	73	73	73	74	72	71	70	70	71	66	63	60	57	53	48	42
	49 Half way between centre & E pedestals	418	32	37	41	49	53	59	63	66	66	66	72	73	74	75	74	75	74	74	73	71	69	67	65	61	58	54	48	41
	50 Opp. Centre pedestal	419	31	34	38	46	53	57	62	64	65	64	69	71	72	72	73	73	72	71	70	68	66	64	61	57	53	48	43	35
	51 Half way between Centre & Western pedestals, by duct support trestle	420	34	37	39																									

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
Kiln 6 road Northern side	54 W end RM6	595	27	33	36	41	45	49	67	55	59	59	55	56	56	55	56	55	55	54	52	51	49	45	42	38	38	36	39	32
	55 Centre RM6	596	30	32	37	42	51	51	64	55	59	59	57	59	59	59	59	59	58	58	56	55	53	50	46	42	39	31	22	14
	56 E End RM6	597	34	37	42	46	56	54	70	60	63	64	61	63	64	62	62	64	63	63	61	61	59	57	54	50	48	41	34	28
	56' Between RM6 & New wall for FA38	598	36	38	44	45	53	54	72	61	65	64	63	64	65	64	63	65	64	64	62	62	61	59	56	52	49	43	36	31
	57 Door opp FA38	599	37	38	42	49	57	55	64	60	63	65	66	67	68	66	66	66	67	67	64	64	62	60	57	53	49	42	35	28
	58 Half way between FA38 & FA39, by big column	600	38	42	47	50	55	56	57	61	66	65	65	66	68	67	67	68	69	67	65	65	63	60	57	55	49	42	35	27
	59 Opp FA39 end	601	38	39	48	51	55	57	61	61	66	66	66	68	69	68	68	69	68	68	67	66	64	61	58	55	50	45	39	32
Fenceline South	Former Gate site opp W end Firing floor	582	25	27	30	33	36	38	40	44	45	42	45	48	47	46	48	46	46	46	44	41	39	36	33	30	28	25	19	14
	Top N edge of bank opposite centre pedestal	584	23	26	29	33	38	42	43	46	46	43	44	48	48	49	50	49	49	49	47	44	41	37	32	29	26	24	19	14
	Top N edge of bank 21m S of centre Alt Fuels Building	585	17	21	27	28	33	34	35	40	40	37	35	39	40	40	39	39	39	38	38	36	35	35	31	27	31	28	24	20
	Top N edge bank Opposite E side old PHT	586	22	25	30	32	37	38	42	52	46	44	47	49	49	49	50	50	49	48	48	45	43	39	34	28	25	25	18	15
	Bottom N edge of bank 13m S of centre Alt Fuels Building	587	16	20	23	26	31	34	34	41	44	39	37	39	38	38	36	36	35	36	36	32	31	30	26	26	33	26	21	18
Kiln Drive platform	S side S motor end @ 1.5m kiln drive	424	36	38	44	49	57	57	62	68	70	68	70	74	72	73	76	75	75	73	72	71	69	67	65	62	60	55	48	41
	S side of S Gbox @ 1.5m	425	37	41	45	48	59	58	60	66	68	71	72	74	73	73	77	74	75	74	73	72	70	68	66	64	63	58	51	45
	E side of S drive motor @ 1.5m, 2m to Gbox	426	38	41	45	50	60	59	63	68	72	70	73	80	74	76	79	75	74	74	72	71	70	67	66	63	60	56	51	43
	53 Kiln drive platform Centre E end on platform between motors	427	40	42	46	47	57	61	64	69	71	68	75	85	75	75	78	76	75	74	73	72	70	68	68	64	60	55	49	42
	53 Kiln drive platform Centre E end on platform between gearboxes	428	41	41	46	48	59	61	65	69	69	69	72	79	73	75	80	75	75	75	74	73	70	68	66	62	59	54	48	40
	N side motor end @ 1m kiln drive	429	43	46	49	53	60	60	64	69	70	71	69	74	74	75	79	76	75	74	73	70	69	67	66	63	59	54	48	42
	N side motor N end @ 1.5m kiln drive	430	35	38	44	49	56	59	64	71	69	70	71	77	73	73	77	75	75	73	72	70	68	66	65	61	57	53	46	39
	N side of N drive & Gbox @ 1.5m	431	36	39	43	47	56	59	63	69	70	70	70	77	76	74	78	77	75	74	72	72	69	67	66	63	59	54	49	44
Kiln 6 road Northern side	54 W end RM6	342	29	40	38	40	43	47	51	54	59	60	57	60	61	58	62	63	59	59	58	54	53	51	48	45	41	38	34	27
	55 Centre RM6	343	30	34	38	42	48	49	52	56	60	59	58	60	62	59	62	63	61	61	60	56	54	51	47	42	36	30	23	16
	56 E End RM6	344	34	40	41	44	50	51	54	57	61	60	61	61	64	62	64	66	64	64	62	59	58	56	54	50	47	43	37	30
	56' Between RM6 & New wall for FA38	345	37	40	43	46	50	50	53	59	62	61	64	64	65	63	66	67	65	65	63	61	60	58	56	53	49	45	39	33
	57 Door opp FA38	346	37	40	41	47	55	53	54	60	62	62	70	66	65	64	66	68	66	69	65	62	60	57	53	50	45	40	34	25
	58 Half way between FA38 & FA39, opposite big column	347	37	43	45	50	53	53	55	60	65	63	66	65	65	65	66	69	67	69	66	62	61	58	55	51	45	39	32	24
	59 Opp FA39 end	348	37	40	48	51	54	54	60	61	66	64	68	65	67	67	68	69	68	68	66	64	62	59	56	52	46	41	35	27
	60 Opp Conditioning Tower	349	38	46	47	50	54	54	60	62	65	64	64	67	67	67	68	69	68	71	67	65	64	60	58	53	48	43	37	30
	60' Opp. Stack	350	39	43	44	47	52	54	60	63	66	65	68	66	67	68	68	69	69	70	67	64	63	60	57	53	47	41	35	27
	64 E end drive platform	351	32	38	42	48	53	57	62	65	65	64	68	74	73	72	74	74	74	73	71	70	68	65	62	58	54	49	43	36
	65 Opp column for return duct W side	352	31	38	41	50	53	58	62	65	67	67	70	73	73	75	75	76	75	74	73	72	70	67	65	61	57	53	47	40
	66 Opp centre pedestal	353	33	40	43	54	49	58	65	66	69	72	74	76	78	78	77	79	78	78	76	75	73	71	68	64	60	55	49	42
	67 Half way between centre & e pedestals	354	32	39	42	53	55	61	69	68	69	68	72	77	77	76	78	78	77	76	75	73	72	70	68	64	61	56	51	43
	68 Opp E pedestal	355	31	40	54	70	60	65	75	72	77	73	75	78	79	79	80	80	79	77	77	74	72	70	67	64	59	55	49	41
Grate Cooler Fan Courtyard	69 Centre courtyard - opposite F201	356	36	42	53	69	62	67	76	73	78	77	77	81	83	83	85	85	83	82	81	78	76	73	71	68	63	57	53	47
	69 Centre courtyard - opposite F203	357	38	39	55	70	64	68	77	74	79	77	77	81	83	82	84	84	82	81	80	77	75	73	71	68	62	57	53	46
	FA201 @ 2m	358	40	44	51	66	63	71	74	76	81	80	79	83	85	87	88	89	87	85	83	81	79	76	74	72	66	61	57	49
	FA201 N side inlet & casing @ 1m	360	38	46	56	71	66	73	79	78	80	79	80	86	88	87	90	90	89	87	85	84	81	79	77	74	68	64	57	49
	Between FA201 & 203 & 202	359	41	50	58	72	67	71	79	79	85	80	85	87	88	88	90	91	89	88	86	83	82	80	78	76	69	65	60	52
	FA203 inlet & casing @ 2m	361	42	46	55	70	62	69	76	74	79	78	78	82	84	83	84	85	83	83	81	79	77	74	73	68	63	58	53	46
	FA203,FA204 & FA205 @ 1m	362	45	45	55	66	65	70	77	73	79	79	79	81	82	81	83	84	82	80	79	77	75	73	75	67	62	57	53	48
	Between inlet filters FA205 & FA206	363	41	46	51	63	58	65	73	71	75	75	73																	

Table 3.2 Kiln 6 Upgrade Frequency p.8

Table 3_2

Table 3.2: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
Kiln Firing Floor	Centre N side opening face E	366	33	36	46	59	52	57	65	66	69	66	70	72	72	72	72	72	75	75	73	72	74	74	72	70	68	65	60	
	Centre N side opening face W	367	33	37	46	60	51	57	66	67	68	67	68	72	73	73	73	73	74	73	70	69	67	65	64	61	60	53	46	
	FA209 E side inlet & filter silencer	368	32	37	47	57	55	61	67	70	72	69	72	76	78	77	78	77	76	76	74	73	72	70	68	66	62	59	54	48
	FA209 Kiln Discharge Seal Fan N inlet W side @ 1.5m	369	33	40	47	58	58	64	69	71	73	73	76	80	83	84	84	85	84	83	82	81	80	77	74	71	68	64	59	54
	Centre S side opening face E	370	35	36	45	59	50	54	60	62	66	63	64	66	68	69	71	71	73	74	73	70	69	69	68	67	66	63	58	53
	Centre S side opening face W	371	35	36	44	58	50	54	60	60	64	62	65	67	68	69	71	72	72	73	72	68	67	66	64	63	62	60	52	46
	FA210 Kiln Discharge Seal Fan S inlet @ 1.5m	372	33	38	45	52	54	57	65	66	70	74	72	73	76	83	84	86	83	82	80	79	79	77	75	72	69	66	62	56
	FA210 S side seal fan inlet W side & casing @ 1m	373	32	37	45	54	56	59	65	66	69	69	73	72	73	75	78	79	77	75	74	72	71	68	66	63	60	56	52	47
	FA200 inlet side @ 1.5m	374	37	42	48	57	60	66	70	73	76	73	82	78	78	78	78	79	78	77	76	76	78	73	70	66	62	58	54	48
	New replacement FA211 centre under kiln, inlet @ 1m	375	39	44	50	61	63	66	73	76	79	81	83	86	89	88	88	87	86	85	85	84	82	80	79	78	76	72	69	64
	Kiln floor centre E S of duct/clinker elevator	376	34	38	46	59	50	54	61	60	64	62	65	67	68	71	69	69	70	74	72	70	69	69	68	67	64	61	55	50
	KFF burner air cannon N side @ 2m	377	37	38	45	52	53	59	62	62	64	64	66	69	70	71	71	71	72	76	78	76	74	76	77	78	77	77	75	73
	KFF burner by air cannon S side @ 2m	378	39	38	43	52	53	58	62	61	65	64	65	68	68	70	70	70	72	77	79	75	73	73	71	71	72	70	65	61
Radicon Cooler	RC L1 centre fan @ 1m	379	35	39	44	54	53	59	66	67	68	69	71	75	75	75	77	78	76	75	77	73	67	65	64	58	53	50	41	35
	RC L1 S fan @ 0.5m	380	34	41	49	54	54	59	65	66	68	66	70	75	74	75	77	78	77	78	78	77	70	68	67	62	57	53	45	38
	RC L1 N fan @ 1m	381	33	40	45	53	54	60	67	67	70	68	73	72	75	75	76	78	76	75	74	72	69	66	64	60	54	50	42	34
	RC L2 centre fan @ 1m	382	34	40	43	55	52	58	65	65	68	68	72	74	75	75	76	77	74	74	77	72	67	66	63	58	54	52	43	36
	RC L2 S fan @ 0.7m	383	36	42	44	56	52	57	63	66	68	66	70	73	74	74	76	77	76	76	78	72	69	67	65	60	55	52	43	36
	RC L2 N fan @ 1m	384	33	40	43	54	52	58	64	66	68	67	71	73	74	75	76	78	76	75	74	72	69	67	64	60	54	51	42	34
	RC L3 Centre fan @ 1m	385	35	42	43	55	52	57	63	66	68	68	72	73	75	74	75	76	73	73	79	72	68	68	65	59	56	55	47	40
	RC L3 S fan @ 0.7m	386	34	42	43	53	51	57	62	66	67	66	69	72	73	72	74	75	73	74	79	72	68	67	63	59	55	52	44	37
	RC L3 N fan @ 1m	387	33	40	44	52	51	57	64	65	67	66	70	71	73	74	76	77	75	74	74	71	69	68	67	60	57	54	45	37
	RC L4 Centre fan @ 1m	388	32	41	45	56	54	58	63	65	65	67	70	72	73	73	74	74	72	73	81	73	68	68	66	60	57	55	47	41
	RC L4 S fan @ 0.7m	389	35	47	46	56	54	58	62	65	66	66	69	71	72	73	73	74	73	74	82	76	70	69	66	62	58	54	48	43
	RC L4 N fan @ 1m	390	31	38	41	54	50	54	60	63	65	63	68	70	70	71	72	73	72	71	72	68	66	65	64	58	54	51	41	33
	RC L5 face E	391	32	41	42	52	51	54	58	67	67	64	68	69	69	69	70	70	69	68	73	66	62	61	58	52	48	45	36	30
	RC L5 face W	392	32	41	41	51	48	53	63	66	64	65	66	69	71	70	72	72	71	70	74	68	64	62	59	55	50	46	39	31
	L1 E side 2.4m	393	33	37	39	46	49	57	60	60	62	62	64	67	67	67	68	68	66	65	67	61	58	56	53	49	45	41	40	37
	L1 E side 6m	394	30	34	37	46	48	55	58	58	60	60	62	63	65	65	65	64	63	63	68	60	57	55	52	48	43	40	36	32
	L1 E side 12m	395	29	35	36	46	46	51	56	57	58	57	59	61	62	63	63	62	61	60	62	58	57	56	53	50	43	38	36	32
FA215	Motor S end @ 2.5m	396	30	38	41	53	48	55	60	61	60	60	63	65	67	68	67	67	67	65	66	67	67	68	69	62	54	47	45	39
	Platform E side drive coupling @ casing @ 1m	397	30	37	40	46	49	53	58	59	60	61	62	64	68	67	68	67	67	66	67	70	71	72	73	70	58	52	53	46
	W side platform @ 1m to coupling & casing	398	31	37	39	52	52	55	58	58	61	61	64	65	68	69	69	69	68	66	68	73	72	72	73	71	59	54	54	48
	Under expansion joint discharge duct to stack @ 1m	399	34	37	38	47	48	55	57	56	56	57	62	62	62	63	63	62	62	61	62	64	65	65	67	61	48	42	41	34
	N side inlet box platform @ 1m to discharge duct & inlet box	400	28	34	36	46	45	48	58	57	58	57	59	59	60	61	61	61	59	58	58	58	56	55	54	51	40	35	32	25
	Platform centre N side inlet box	401	29	34	38	44	45	50	56	56	55	57	60	62	62	63	63	62	62	60	60	58	56	55	54	50	42	39	39	33
	Under Inlet box W side entry duct	402	30	33	40	50	50	55	60	57	57	59	62	64	65	66	66	66	65	64	63	63	62	63	64	57	47	41	39	32
	Inlet box N side ground level @ 1m	403	30	37	40	46	45	50	56	56	58	58	62	62	61	62	64	63	62	60	60	59	57	56	54	51	40	34	31	24
Control Building Roof	Roof SW corner opp E end RM6	432	28	36	35	39	42	45	48	51	55	55	56	59	61	62	63	62	61	61	60	57	55	52	48	44	38	31	23	15
	Roof SE corner opp FA38	433	28	35	36	39	47	48	49	54	58	57	57	62	63	63	63	63	62	62	61	58	57	54	52	49	44	40	32	20
	Admin Building Roof NE corner opp FA502 & CM7	434	27	41	39	40	46	46	48	52	57	56	56	60	63	63	63	62	62	61	60	57	55	52	49	45	40	34	27	17
	Roof SW corner opp E end RM6	592	28	33	36	40	46	46	49	53	56	56	57	62	64	63	61	62	63	60	58	56	54	51	47	42	38	31	26	20
	Roof SE corner opp FA38	593	27	33	3																									

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
PHT Level 8	PHT L8 Top platform level with top of stack	202	1	2	3	2	4	2	3	6	1	4	0	5	2	3	3	1	1	2	0	0	0	1	0	3	0	0
	PHT L8 Top platform EL16 Gbox @ 1m to coupling NW side	203	1	1	1	1	1	0	1	2	2	4	1	7	3	2	3	2	0	1	1	1	0	2	1	4	0	1
	PHT L8 Top platform EL16 Gbox @ 1m to coupling SW side	204	1	2	1	0	0	1	1	5	0	2	1	4	1	2	1	1	1	3	1	1	0	1	1	4	0	1
	PHT L8 Top platform EL16 Gbox @ 2m to motor S side	205	0	2	2	0	0	0	3	7	2	6	3	10	3	3	3	2	0	3	1	0	0	1	1	3	0	1
	PHT L8 Top platform EL16 Gbox @ 1m to NE side	206	0	1	1	1	4	3	0	3	1	2	2	9	7	4	10	6	1	2	1	2	1	0	0	2	0	0
	PHT L8 Lower platform	207	0	4	2	1	1	1	1	6	0	3	1	5	2	2	3	2	1	4	2	0	0	1	0	3	1	0
	PHT L8 Top platform EL16 Gbox @ 3m to N side	208	1	2	2	4	0	3	2	5	0	2	3	7	3	6	12	7	2	0	0	1	1	1	0	2	0	0
	PHT L8 proper FA263 motor & casing @ 1m	209	4	1	1	2	1	0	1	0	8	4	0	4	4	6	12	6	5	11	5	0	0	1	1	0	1	0
	PHT L8 proper 1m to vent on FA263 filter room	210	3	1	3	2	1	2	3	1	8	3	1	1	0	2	7	5	2	6	0	2	0	1	0	0	1	0
	PHT L8 centre tower W side	211	2	2	1	3	1	4	6	0	2	4	3	1	0	1	2	1	0	1	0	1	1	2	3	2	1	3
	L8 new PHT centre	212	0	2	0	2	1	2	1	6	2	2	1	1	1	1	1	0	1	2	1	0	1	2	3	2	1	2
	PHT L8 centre tower N side	213	3	3	2	2	0	1	1	2	1	1	1	0	0	0	1	1	0	1	1	0	0	1	0	0	1	3
	PHT L8 centre tower E side	214	1	1	1	1	3	1	1	3	1	1	1	0	1	0	1	1	0	2	1	0	1	2	2	2	1	2
	PHT L8 centre tower S side	215	0	2	1	0	2	0	0	4	2	0	1	0	1	1	0	0	0	2	2	0	2	2	5	4	1	1
PHT Level 7	PHT L7 New S side centre	216	3	1	2	0	3	1	1	3	2	0	2	1	1	0	2	1	1	3	1	0	0	0	1	1	1	3
	PHT L7 New E side centre	217	3	2	1	0	2	0	2	2	3	1	0	1	1	0	1	1	1	3	1	0	0	1	0	1	8	14
	PHT L7 New N side centre	218	8	2	1	2	2	1	1	4	2	1	2	1	0	1	0	0	0	1	0	1	0	1	0	0	5	10
	PHT L7 New E side 4m to base of Alt Fuel chute, 1m to bin W	219	5	2	2	2	3	1	1	4	4	0	1	1	0	1	0	0	0	1	0	0	0	1	0	1	7	13
PHT L7 Alt Fuels Platform L1	PHT L7 Alt Fuels Platform L1: E side of feeder @ 1m	220	5	2	1	2	0	2	0	1	1	0	1	1	1	0	1	0	0	1	0	0	1	0	0	1	8	14
	PHT L7 Alt Fuels Platform L1: E side of mixer @ 1m	221	3	1	1	0	2	1	1	3	4	0	3	1	1	1	0	0	0	1	0	0	0	1	0	0	7	13
	PHT L7 Alt Fuels Platform L2: N side of conveyor discharge	222	6	3	2	4	1	3	2	0	1	1	0	0	0	0	1	0	0	1	1	0	0	1	1	1	8	15
	PHT L7 Alt Fuels Platform L2: 1m E side of chute inlet	223	5	2	1	1	0	1	1	0	1	0	0	0	1	0	1	0	0	1	0	0	1	1	1	0	7	14
	PHT L7 Alt Fuels Platform L2: 1m E side of conveyor 3m from entry to chute	224	1	1	0	1	0	2	0	3	4	1	1	2	1	1	0	0	1	2	1	0	0	1	0	0	4	9
	PHT L7 Alt Fuels Platform L2: 1m NW side of conveyor drive motor	225	4	3	0	1	2	1	1	4	3	1	1	0	0	0	1	0	0	2	1	0	0	1	1	0	8	16
	PHT L7 Alt Fuels Platform L2: 1m SW side of conveyor drive gearbox	226	3	1	0	1	3	3	2	2	3	0	1	0	1	0	1	0	0	2	0	0	1	1	1	2	8	14
PHT Level 7	PHT L7 New centre between towers faces S	227	2	3	5	3	3	1	1	6	1	3	3	1	1	2	5	2	1	3	1	0	1	0	1	1	5	10
	L7 between PHTs centre facing W	228	3	2	4	4	1	1	1	5	2	2	2	0	0	1	3	2	1	2	1	0	1	1	1	1	4	8
	PHT L7 Old S side centre	229	0	0	3	4	1	0	0	4	0	3	1	1	2	2	4	2	1	4	2	1	0	0	0	1	0	1
	PHT L7 under EL13 platform E side	230	2	0	1	1	1	1	5	9	2	4	4	2	0	1	2	0	1	2	2	0	1	1	1	3	2	0
	EL13 platform E side Gbox & coupling @ 0.5m	231	0	1	1	1	2	2	4	5	2	7	8	4	3	1	1	2	0	0	1	0	1	1	0	0	1	0
	EL13 platform N side GB end & side EL @ 1m	232	0	1	1	0	1	1	4	11	4	4	6	5	2	0	2	1	1	4	3	3	2	1	1	0	1	1
	L7 BE drive platform N side @ 1m to BE	233	1	2	0	1	2	1	3	9	3	2	2	1	1	1	3	1	1	2	2	2	0	0	1	0	0	0
	EL13 platform SW side motor & EL & coupling @ 1m	234	1	1	0	2	2	2	1	9	5	3	3	3	5	2	1	1	0	1	2	2	1	1	0	0	1	0
	EL13 platform W side 0.5m	235	1	2	4	2	2	0	4	14	5	5	3	1	3	3	2	2	2	1	1	1	1	0	3	0	1	1
	EL13 platform motor end @ 0.6m	236	0	0	0	3	5	2	4	9	3	4	4	1	2	1	1	1	0	0	1	1	1	1	1	1	1	0
	L7 centre between cylinders	237	1	1	3	4	2	1	2	7	2	2	2	1	0	1	4	3	1	4	1	0	0	1	0	0	0	1
	PHT L7 old NW corner 1.5m to stack	238	1	2	2	5	2	1	0	7	4	0	1	1	0	1	1	1	0	2	0	0	0	0	1	0	0	0
	PHT L7 old centre N side	239	2	1	0	3	2	0	3	6	3	2	1	0	0	0	0	1	0	2	1	0	0	0	0	0	0	0
	PHT L7 old centre N side on new platform	240	2	0	1	3	0	1	3	10	5	0	0	0	1	1	0	1	0	2	1	0	0	0	0	0	0	1
	PHT Level 7: FA213 @ 1m, door open	241	3	2	4	2	2	1	1	6	4	3	3	5	3	3	1	2	2	2	0	0	0	0	0	0	0	1

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
PHT Level 6 RM Silo Top	PHT L6 RM silo above baghouse discharge @ 2m at base of stairs to EL	242	1	3	4	2	5	4	4	3	1	1	0	2	5	4	0	1	1	3	2	1	0	1	0	0	1	1
	PHT L6 RM silo Top FA260 NE side @ 1m casing & motor	243	2	4	2	5	8	4	1	1	1	0	1	2	0	0	5	5	2	7	3	1	1	1	2	3	0	0
	PHT L6 RM Silo top EL15 platform motor side 0.6m	244	1	3	1	5	5	3	1	2	1	4	3	2	3	0	3	1	1	3	1	1	0	0	0	0	1	1
	EL15 W side @ 1m	245	0	2	0	5	2	1	1	2	0	2	1	3	3	0	2	0	2	4	2	0	0	0	0	0	0	0
	L6 RM silo top on BE EL15 platform SW side @ 0.8m	246	0	0	0	4	3	3	3	4	3	0	0	2	2	1	3	1	1	2	0	0	0	0	0	0	0	2
	EL15 S side Gbox @ 1m	247	0	3	2	4	4	2	3	7	4	2	6	11	5	5	7	2	1	1	3	2	0	1	1	0	1	1
	EL15 E side Gbox @ 0.5m	248	1	2	2	3	5	4	2	2	2	0	5	9	5	3	9	3	2	2	0	1	0	1	0	0	0	1
	RM silo top baghouse fan DC30 discharge @ 1.5m	249	3	5	5	5	8	3	0	2	1	4	5	0	6	4	1	2	3	6	3	0	1	0	1	0	0	1
	RM Silo top E side 12.7m to FA260	250	1	1	1	2	4	2	4	7	1	2	1	1	2	2	1	1	4	9	4	0	0	0	1	2	0	0
	RM Silo top N side 12.7m to FA260	251	2	2	4	1	6	4	4	9	6	1	3	0	2	1	1	0	2	4	2	0	0	1	1	1	0	1
PHT Level 6	PHT L6 centre W side	252	1	1	1	2	3	0	2	4	2	3	5	1	1	1	0	2	1	0	0	0	1	2	0	0	1	1
	PHT L6 stack test port 100mm diam @ 200mm	253	0	0	0	0	1	2	1	3	2	4	11	6	2	1	3	3	3	3	0	2	1	1	1	1	2	0
	PHT L6 stack test port 100mm diam @ 200mm	254	0	1	0	3	3	2	1	3	2	4	11	6	2	1	4	3	3	3	1	2	1	1	0	1	3	0
	PHT L6 NW corner 1m to stack	255	2	1	0	0	0	3	1	3	0	6	8	1	1	1	0	2	2	0	1	1	2	2	6	2	0	1
	PHT L6 centre N side by platform	256	6	5	4	2	0	2	1	3	2	1	2	1	0	0	1	0	0	1	0	0	1	2	0	0	1	0
	PHT L6 centre N side on platform	257	4	1	0	1	1	2	1	4	3	0	1	1	0	0	1	0	0	1	0	0	1	0	1	1	1	0
	PHT L6 centre between towers	258	3	2	0	1	0	2	2	2	1	1	2	1	0	0	2	0	1	2	1	0	0	1	0	0	2	1
	PHT L6 new N side centre	259	1	5	4	1	1	3	3	2	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1
	PHT L6 new E side centre	260	1	3	2	1	1	2	1	3	2	1	1	1	0	0	1	0	0	1	0	1	0	0	1	1	0	1
	PHT L6 new S side centre	261	1	3	3	1	1	0	1	3	3	1	0	0	0	0	1	0	1	1	1	1	0	0	0	1	1	1
	L6 centre S side old PHT by elevator	262	0	0	1	0	2	1	1	4	3	1	2	0	0	0	1	1	1	2	1	0	2	3	1	1	2	1
PHT Level 6 Inside Silo Top	L6 inside doorway to top RM silo room	263	3	3	2	1	3	4	2	1	1	3	2	1	2	0	2	1	0	0	1	0	0	1	1	2	7	3
	RM Silo top inside centre	264	3	3	2	2	5	4	1	1	3	5	4	2	4	4	1	1	1	1	0	0	1	1	1	2	7	3
	RM silo top inside E doors open	265	1	1	3	2	6	5	2	1	2	3	3	2	3	2	1	1	0	1	0	0	0	1	3	3	13	6
	L6 RM silo top room inside S man door	266	1	2	6	1	6	3	0	0	1	3	4	2	2	1	1	1	2	1	1	2	0	0	0	1	2	2
	RM silo top outside S man door	267	0	1	2	2	3	1	1	2	1	1	2	0	4	4	3	4	1	1	1	1	1	1	1	0	1	1
PHT Level 5	PHT Level 5 old centre S side by stairs	268	2	1	0	0	1	1	1	5	2	2	2	1	2	2	1	0	0	0	0	1	2	2	1	2	1	2
	PHT Level 5 old centre W side by gas valves @ 1m	269	2	1	0	0	1	2	1	4	2	2	3	1	2	2	1	0	1	0	3	3	3	4	2	3	3	2
	PHT Level 5 old NW corner @ 1m to stack	270	2	1	1	3	2	4	3	3	2	2	3	0	1	0	0	1	1	1	1	1	3	3	1	3	2	2
	PHT Level 5 old centre N side	271	1	1	1	0	1	0	0	4	2	2	2	1	0	0	1	0	0	0	0	0	3	4	1	0	1	1
	PHT Level 5 centre between towers	272	1	1	2	1	0	1	1	3	2	1	2	0	0	0	1	0	0	1	0	0	0	1	1	0	2	0
	PHT Level 5 New centre N side	273	2	1	2	0	0	2	2	3	2	1	1	0	1	1	1	0	0	0	0	0	0	0	1	0	1	0
	PHT Level 5 New centre E side above kiln	274	0	1	1	0	0	2	3	2	2	0	1	1	1	1	1	0	0	0	0	1	0	0	2	2	1	1
	PHT Level 5 New centre S side	275	1	1	1	1	2	1	0	3	3	1	1	0	0	0	0	0	0	1	0	0	1	2	1	3	1	0
PHT Level 4	PHT Level 4 old centre S side by stairs	276	1	1	6	10	1	5	2	1	1	2	2	0	0	0	0	0	0	1	2	0	1	1	1	1	0	1
	PHT Level 4 old SW corner by water pumps SV09 @ 1m N	277	0	0	4	8	1	3	0	2	1	3	2	0	2	2	1	1	0	0	0	0	0	0	1	0	1	0
	PHT Level 4 old centre W side	278	2	1	4	3	1	2	0	3	1	4	2	1	3	2	1	1	0	0	0	0	0	0	1	0	1	0
	PHT Level 4 old NW corner @ 1.2m to stack	279	1	1	1	2	0	4	2	4	1	3	3	1	1	0	0	1	0	0	0	0	0	1	1	0	2	0
	PHT Level 4 old centre N side	280	1	0	2	1	1	4	3	4	3	1	2	0	1	0	0	1	0	0	0	0	1	1	0	0	1	0
	PHT Level 4 centre between towers by air cannon @ 2m	281	1	1	3	6	4	0	1	3	3	0	2	1	1	1	0	1	0	0	0	0	0	0	1	1	4	1
	PHT Level 4 new centre N side	282	1	2	0	2	2	0	1	2	2	1	2	0	0	0	0	1	0	0	0	0	0	0	0	2	5	2
	PHT Level 4 new centre E side above kiln	283	3	4	1	1	1	1	2	3	3	0	1	0	1	1	0	0	0	0	0	0	0	0	1	3	6	1
	PHT Level 4 new centre S side	284	1	1	2	5	3	2	2	2	3	0	2	1	0	0	0	0	1	0	0	1	0	0	0	1	2	1

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
ESP	ESP Centre E side top walkway looking E to PHT	285	1	0	3	5	3	1	0	4	1	3	1	2	1	2	5	2	1	3	2	1	1	0	1	0	1	1
	ESP top SE corner at barrier	286	0	1	4	5	2	1	1	1	1	2	0	1	1	2	6	2	2	2	1	1	0	0	0	1	0	0
	ESP top SE corner at barrier - facing ESP	287	1	0	2	2	1	2	2	2	0	2	1	1	2	1	3	2	0	1	0	0	1	1	1	0	1	0
	ESP top centre E side S platform facing PHT	288	1	2	6	7	2	2	1	2	1	2	0	1	2	2	3	3	0	1	0	0	1	1	1	0	1	0
	ESP top NE corner at barrier	289	2	2	6	8	3	2	0	2	3	2	0	0	0	0	2	1	0	1	0	0	1	1	0	0	1	1
	ESP top NE corner at barrier - facing west	290	0	1	3	4	2	1	0	3	0	1	1	0	1	1	1	1	0	2	0	0	0	0	1	0	2	1
PHT Level 3	L3 old PHT centre S side @ 2m to edge facing centre	291	0	2	5	8	2	2	0	1	1	2	0	2	1	1	1	2	1	0	0	0	0	0	1	0	0	0
	PHT Level 3 old centre W side above FA39	292	0	4	7	8	3	2	0	3	0	3	3	0	0	0	1	0	1	0	0	0	0	1	1	0	0	1
	PHT Level 3 old centre N side	293	4	1	5	7	2	3	1	2	1	3	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	PHT Level 3 old centre E side above kiln	294	1	4	3	2	1	2	2	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PHT Level 3 old NW corner by stack @ 1.5m, above FA39 inlet	295	1	5	3	2	0	0	1	2	1	1	3	1	0	1	1	1	1	0	1	0	0	1	0	0	1	1
PHT Level 2	PHT Level 2.5 by DC31 drives @ 0.6m	296	6	5	6	7	1	2	1	1	0	2	0	1	3	3	1	1	0	0	0	0	0	1	0	1	2	1
	PHT Level 2.5 by DC31 discharge @ 1m	297	3	1	5	10	3	1	3	6	1	3	3	0	1	2	0	0	1	1	0	1	1	1	0	0	1	1
	PHT Level 2.25 by centre by kiln entry	298	4	5	7	6	1	0	1	2	2	4	0	2	2	3	4	5	2	1	1	1	2	1	1	1	1	0
	PHT Level 2.25 North Side centre	299	2	1	8	11	0	5	0	2	2	3	1	0	1	1	1	2	0	0	0	1	1	1	1	1	0	0
	PHT Level 2.25 by Radicon Gbox drive E end @ 2.5m	300	1	1	5	8	1	3	1	2	0	3	0	2	1	0	3	6	2	1	1	1	1	0	0	0	0	1
	L2.25 PHT centre W side facing fan discharge DC70 FA63 @ 4.66m, stack @ 6.35m and stack entry duct @ 6.23m	301	1	1	10	15	1	4	0	1	2	5	2	1	1	2	2	3	0	1	0	0	1	1	0	0	1	1
	L2 PHT FA03 casing @ 1m E side	303	0	3	7	8	3	1	1	2	1	3	1	1	1	3	3	2	2	1	0	1	0	1	0	0	0	2
	PHT Level 2 by E side drive coupling & casing DC70 FA63 centre N side	302	1	5	7	6	3	2	1	3	0	2	0	1	1	0	3	3	0	0	0	0	0	0	0	0	0	3
	PHT Level 2 FA63 discharge @ 1.5m	305	0	1	10	14	2	0	4	5	1	3	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	1
	PHT Level 2 @ 1m to south side FA39 stack entry duct	306	0	3	10	12	0	6	0	4	1	2	1	2	0	1	0	1	0	1	0	0	0	0	0	0	1	2
	PHT Level 2 FA65 inlet filter @ 1m in front	307	1	1	6	10	1	6	4	0	0	0	2	1	2	1	2	3	0	1	1	0	0	1	0	0	1	1
	PHT Level 2 FA65 rear side 1m	308	0	1	7	13	1	5	3	4	1	3	1	4	1	1	1	2	0	1	1	0	0	0	1	1	1	1
	L2 PHT centre N side edge @ 2m facing centre	304	1	1	8	12	2	4	1	3	2	1	0	1	1	1	1	1	2	1	0	0	0	0	1	0	1	1
	PHT Level 2 @ 1m to north side FA39 stack entry duct	309	0	3	9	9	2	3	2	5	2	3	1	2	0	1	0	1	1	1	0	1	0	0	0	0	0	1
PHT Level 1	PHT Level 1 RM silo base blower room N side man door @ 1m	310	2	0	3	7	6	1	4	4	5	5	1	1	2	3	2	1	0	1	1	1	0	0	1	0	1	0
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m NW side	311	2	4	5	1	7	8	1	0	1	2	2	1	2	2	0	1	2	1	0	0	0	1	0	2	1	0
	PHT Level 1 FA92 silo vent fan casing & drive @ 1m E side	312	5	1	2	3	7	9	0	2	0	1	1	1	1	1	1	0	1	1	1	0	1	1	3	1	0	0
	PHT Level 1 FA92 silo vent fan inlet duct @ 1m SE side	313	4	1	3	0	3	3	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	1	3	0	0
	PHT Level 1 FA92 silo vent fan inlet front @ 1m	314	6	0	1	1	3	6	0	1	0	1	1	0	0	2	0	1	1	1	1	0	0	0	0	0	1	1

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
FA39	FA39 E side at concrete line 5.4m to motor	315	1	3	3	4	3	0	3	7	2	1	1	2	3	4	3	2	2	1	2	2	0	0	1	1	0	1
	FA39 E side @2.3m in line with columns	316	1	4	5	6	3	1	1	3	4	7	3	1	0	1	3	4	5	0	2	2	1	0	2	1	0	1
	FA39 under discharge duct @ 1m	317	0	3	2	4	3	1	1	3	1	3	1	0	0	3	8	5	1	5	4	3	0	1	2	1	1	1
	FA39 E side motor platform @ 0.82m to coupling cover	318	4	6	5	5	4	2	1	2	5	6	0	4	3	1	0	0	1	1	0	0	0	0	1	0	0	1
	FA39 motor platform centre E side@ 1m	319	1	2	5	0	5	5	5	4	2	4	1	3	3	2	0	2	7	4	0	1	1	0	3	2	1	0
	FA39 motor N end @ 2.7 to end plates/stop button	320	2	3	4	6	2	2	1	3	4	6	3	0	1	1	3	3	3	0	1	1	1	2	1	1	1	1
	FA 39 N side on kerb	321	2	2	1	0	2	2	2	4	2	1	1	1	1	1	4	2	1	1	1	2	1	1	1	1	1	0
	FA39 W side at metal strip 5.25m to motor	322	2	2	4	5	2	1	1	3	5	7	3	0	1	2	5	4	3	1	2	2	1	1	1	1	1	0
	FA39 W side at columns @2.7m to plinth	323	2	3	4	5	3	1	2	2	6	14	7	1	1	3	4	6	8	1	1	1	0	0	2	1	1	0
	FA39 W side motor platform at 0.8m to coupling cover & 1m to coupling	324	2	6	5	4	4	4	4	3	6	12	5	4	3	0	1	1	3	0	0	0	1	2	0	0	0	1
	FA39 W side @ 1m to cladding door open, 1.33m to casing	325	0	3	3	5	3	4	1	8	4	6	5	1	1	2	6	4	0	5	4	2	0	0	0	1	2	1
	FA39 S side @ columns 2.7m to bearing	326	3	4	5	8	2	3	1	4	2	1	1	2	2	2	9	7	2	7	5	3	1	1	0	0	1	2
	FA39 S side platform bearing cover @ 0.8m	327	0	2	3	3	1	2	3	4	0	3	1	2	2	2	9	7	2	6	3	1	2	1	0	1	0	1
	Centre between FA38 & FA39 @ 11.2m facing E	328	1	1	1	2	1	2	0	3	3	2	1	1	1	1	4	5	6	0	2	1	0	1	1	0	1	1
FA38	Centre between FA38 & FA39 @ 7.7 m facing FA 38	329	1	1	1	1	2	0	0	3	2	1	0	1	0	3	0	2	5	2	0	0	0	1	0	0	1	1
	FA38 @ 3.9m to E side	330	2	3	2	1	1	2	0	2	3	5	2	1	1	4	4	0	6	3	1	1	0	0	0	0	1	0
	FA38 @ 3m to N side	331	3	1	2	4	2	1	0	3	2	4	2	1	1	4	4	0	7	4	0	1	0	0	1	0	0	0
	FA38 @ 5m to NW side at NW column	332	3	1	0	1	2	1	1	3	2	4	2	0	2	3	3	0	6	4	0	0	0	0	1	0	0	0
	FA38 @ 5m to NW side at W column	333	0	1	1	1	1	3	1	1	1	3	3	1	0	2	3	1	3	0	1	0	0	0	0	0	0	0
	In centre opening of wall on W side	334	0	0	3	6	2	0	1	2	2	2	2	1	1	1	2	0	2	1	1	0	0	0	1	0	0	1
	FA38 motor platform W side @ 1m to coupling cover, 1.9m to casing, 0.7m to motor side	335	1	0	2	5	4	2	2	1	3	3	2	1	2	0	2	0	9	3	1	0	0	0	1	1	0	0
	FA38 at opening on S side of road facing FA38 opening	336	2	1	1	3	1	1	0	1	2	3	1	3	3	2	2	3	2	0	0	0	1	0	0	0	1	0
	56' Road kerb N side opp. Opening to FA38	337	1	0	0	1	1	1	1	2	1	0	0	1	2	1	2	2	2	0	0	0	1	0	0	0	1	1
	57 Road N side opp FA38 doorway	338	0	2	0	4	2	1	0	2	2	3	1	1	2	1	1	2	4	2	0	1	0	0	1	0	1	1
	58 Road N side between FA38 & FA39	339	2	1	1	1	1	1	0	3	2	1	0	0	1	0	0	0	2	1	0	1	0	1	1	0	1	1
RM6	1 RM6 W door @ 1m	340	0	1	1	1	1	0	0	0	4	2	1	3	6	4	4	3	1	1	1	0	1	1	1	0	0	2
	1' RM6 W door at kerb W side @ 13.3m	341	3	1	1	1	1	0	0	1	1	4	1	5	5	2	4	3	0	2	1	1	1	0	1	0	1	0
RM7	1 RM7 at roadside kerb ~32m	474	2	4	3	3	1	2	3	3	3	3	1	3	2	1	0	1	1	0	0	0	0	0	1	1	1	
	2 Rm7 @ 15.5m to W door	475	2	3	2	0	6	4	3	4	3	3	2	3	2	2	1	0	0	1	0	0	0	0	0	1	1	
	3 RM7 W wall door @ 1m	476	2	6	2	3	3	1	4	4	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	0	1	1
	4 RM7 NE corner wall vents 2 1m	477	3	6	3	3	6	3	3	5	0	2	2	2	0	1	3	2	0	0	0	1	1	0	1	0	0	0
	5 RM7 N side NW roll door @ 1m	478	4	7	4	1	1	3	1	8	4	1	3	3	3	4	2	0	1	1	1	0	0	1	0	0	1	1
	6 RM7 N wall vents centre next to Roll door	479	2	6	2	0	1	0	2	4	0	1	2	4	3	2	0	1	0	1	0	0	1	0	1	0	0	1
	RM7 vents N wall W of man door	480	2	7	1	2	1	1	2	5	0	2	2	4	3	5	3	1	2	0	0	1	2	1	1	0	0	1
	7 RM7 N wall man door	481	2	5	3	3	4	4	3	2	1	2	2	4	3	4	1	2	2	1	1	0	1	0	0	1	1	0
	8 RM7 E wall vents NE corner @ 1m	482	1	3	1	3	1	2	0	4	0	1	2	2	4	7	3	2	2	1	1	0	1	1	0	0	1	1
	9 RM7 E side under duct	483	2	2	1	0	0	1	1	2	2	1	1	1	5	10	3	2	2	0	0	0	0	1	0	0	1	0
	10 RM7 By E door RM7 floor	484	1	1	0	5	2	0	2	3	1	1	1	2	5	7	2	2	1	0	0	0	1	1	0	1	2	0
	10 RM7 By E door Hydraulics room open	485	3	1	1	0	1	1	2	3	1	1	1	1	2	4	3	0	2	1	0	1	0	0	0	0	1	1
	11 RM7 Centre Compressor room door @ 1m closed	486	4	2	1	2	1	2	2	5	1	0	0	1	3	4	2	1	2	2	1	0	0	0	1	0	1	0
	11A RM7 compressor room W door @ 1m closed	487	3	2	2	4	0	4	1	3	1	1	2	1	1	3	2	1	1	1	1	0	1	1	1	0	1	0
	12 RM7 Under E inlet for switchroom fan	488	6	1	0	2	1	1	1	5	7	2	9	6	2	2	1	0	1	1	1	1	0	1	2	0	5	0
	12B Under switchroom fan duct W	489	3	2	0	0	1	4	1	6	5	0	9	7	0	2	1	0	1	1	1	1	0	1	0	0	4	0
	12 RM7 E inlet for switchroom fan @ 1m to N side and 0.6m below	490	4	1	1	1	0	2	0	5	2	2	5	3	1	2	1	1	2	2	1	1	0	1	1	0	4	1

Table 3.2 Kiln 6 Upgrade Frequency p.4

Table 3_2

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																										
			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	
FA249	13 FA249 under inlet duct W side	491	3	2	0	2	3	4	9	3	2	3	2	0	5	13	6	4	5	2	0	1	1	1	0	0	1	1	
	14 FA249 2m W side ground level	492	3	1	1	1	4	2	11	5	4	10	7	0	4	10	4	4	4	2	1	1	1	1	0	0	1	1	
	14' FA249 motor platform fan coupling & casing W side @ 1m	493	3	1	3	1	0	1	1	0	0	4	3	0	4	10	5	1	3	2	2	1	1	3	1	1	1	0	
	15 FA249 1m motor end	494	1	0	2	1	5	2	14	8	2	5	3	1	3	10	6	1	3	1	1	0	1	2	1	0	1	1	
	16 FA249 end at column 4.3m N of motor plinth	495	3	0	1	5	5	3	12	7	0	4	3	1	3	11	6	4	7	4	1	1	1	1	0	0	1	1	
	17 FA249 motor platform E side coupling & casing 1m	496	5	4	3	1	2	3	7	3	1	4	4	0	4	9	4	1	2	1	1	1	1	3	2	0	0	1	
	18 FA249 Platform S side centre @ 1m	497	3	6	1	1	3	1	2	2	2	1	2	1	3	6	3	0	0	1	1	0	0	0	0	1	2	1	0
	18' FA249 platform S side under discharge duct E side	498	3	3	2	1	3	3	5	3	5	4	3	1	2	9	5	1	1	2	1	0	1	1	1	0	1	1	
	19 FA249 S side @ 3.8m	499	1	2	0	0	2	1	4	1	1	4	3	0	2	5	2	1	1	0	0	0	0	1	1	0	1	0	
	19 FA249 S side @ 5.5m	500	2	1	1	2	2	2	7	3	0	1	1	1	1	7	4	1	2	0	1	0	0	1	1	0	1	0	
	20 FA 249 S side @ 10.9m	501	1	2	2	3	3	3	9	4	3	5	3	1	4	9	4	1	1	1	1	0	0	1	1	0	1	0	
	21 FA249 E side of fan casing ground level @ 2m	502	1	4	2	1	0	3	5	2	3	4	2	1	4	11	5	2	2	0	1	1	1	1	0	0	1	0	
FA250	22 FA250 S side 4.2 m to motor end	503	5	2	1	4	3	4	8	5	1	7	6	0	4	12	6	3	5	3	1	1	1	1	0	1	0	1	
	22' FA250 Motor end S side @ 1m	504	3	0	2	1	1	3	7	4	1	2	3	0	1	6	3	1	2	1	1	1	1	1	0	0	0	1	
	23 FA250 E side platform coupling & casing	505	2	1	5	3	1	2	3	1	4	3	0	1	1	7	4	1	2	2	1	0	1	2	1	1	0	1	
	23' FA250 E side centre motor @ 1m	506	2	1	4	3	1	0	1	1	4	2	1	0	2	5	2	2	3	2	2	0	2	3	1	0	0	2	
	FA250 W side motor shaft @ casing @ 1m	507	4	1	5	1	1	2	1	0	4	0	3	1	0	4	1	1	1	1	1	1	1	2	1	0	0	1	
	25 FA250 coupling & casing W side motor centre @1m	508	3	3	3	1	0	2	1	1	4	2	2	1	3	5	1	2	2	2	1	0	1	2	1	0	0	1	
	26 FA250 W side casing @ 1m & coupling @ 3m	509	3	2	1	2	0	2	2	3	5	3	3	3	2	4	1	3	4	3	2	1	1	2	2	3	1	1	
	27 FA250 W side 1m under inlet casing expansion joint	510	2	3	0	1	1	1	3	3	5	4	1	1	2	5	2	2	2	1	1	0	0	0	0	0	1	1	
	28 FA250 N side casing shaft platform @ 1m	511	3	2	0	3	2	2	3	0	2	4	5	3	0	1	2	1	1	2	1	2	1	0	0	0	0	2	
	29 FA250 E side under discharge duct @ 1.5m, at lower step of concrete	512	2	3	2	3	1	4	6	1	2	0	3	2	5	8	2	2	1	0	1	0	0	1	0	0	0	1	
RM7 Roof Platform Lower	Lower platform E side 1m to Magnete plate	513	1	1	2	3	5	0	7	4	0	0	2	2	1	1	0	1	0	1	0	0	1	0	0	1	0	0	
	Lower platform S side @ 1m to magnete plate	514	0	2	2	1	3	1	4	2	2	2	1	1	2	0	1	0	0	1	1	1	1	0	1	1	2	2	
	Lower platform W side @ 0.9m to magnete plate	515	0	2	1	2	2	0	3	1	0	0	1	1	0	1	1	1	0	0	0	1	1	0	0	0	1	0	
	Lower platform N side @ 1m to magnete plate	516	0	1	0	3	4	1	7	2	2	0	3	1	0	2	1	0	0	0	0	1	2	1	1	1	1	1	
	Lower platform N side @ 1m to BE casing	517	1	2	2	4	6	0	8	3	2	2	0	1	0	3	2	0	1	1	0	1	2	1	0	1	1	0	
	Platform S of Magnete 2m to S side	518	0	2	1	2	4	2	9	3	2	3	4	1	0	0	1	1	1	0	1	0	1	1	1	1	1	0	
	Platform S of Magnete 2m to S side	519	1	1	1	2	2	1	1	1	2	2	3	1	1	0	1	0	0	0	0	0	1	1	1	2	1	0	
	Lower platform N side @ 1m to BE casing	520	0	1	2	2	4	3	2	3	2	4	2	0	1	3	2	0	1	1	0	1	2	1	1	0	1	0	
RM7 Roof Platform Upper	Upper Platform Gbox @ 1m E side & 0.5m casing	521	1	1	0	3	3	2	10	6	3	8	6	0	2	1	2	1	0	0	0	1	3	0	0	0	1	0	
	Upper Platform Gbox @ 1m N side	522	1	1	2	2	4	1	8	4	1	4	4	0	1	1	1	1	0	0	1	0	1	0	2	0	0	0	
	Upper Platform motor end @ 1m W side	523	0	1	0	4	6	0	10	6	3	8	6	2	1	1	1	1	0	1	1	0	2	0	0	0	1	0	
	Upper Platform BE casing @ 0.9m W side	524	1	1	0	4	5	1	10	6	1	3	2	0	0	1	0	1	1	1	0	0	2	0	0	0	1	0	
	Upper Platform BE casing @ 1m S side	525	1	1	1	4	4	0	3	1	0	1	2	1	1	2	0	0	0	0	1	1	1	1	1	0	1	0	
	Upper Platform BE casing @ 1m E side	526	0	0	1	4	3	2	9	4	1	1	4	1	0	1	0	1	0	0	1	1	2	1	0	0	1	0	
RM7 Baghouse Tower	On tower to baghouse top S side above FA249 same level as roof RM7	527	0	0	1	3	2	4	4	2	3	3	2	0	1	3	1	1	1	1	0	2	3	0	1	1	2		
	On tower to baghouse top S side above FA249 top level	528	1	2	1	2	1	1	0	2	1	3	3	1	2	3	1	0	0	0	0	0	0	1	0	0	1	0	
	Baghouse S doorway open	529	1	0	0	0	1	2	2	5	1	1	1	1	2	4	2	1	0	1	0	1	1	1	1	1	1	1	
	Inside centre baghouse top	530	4	3	0	2	2	1	1	3	1	1	0	1	1	1	0	0	0	1	1	0	0	1	0	0	1	0	

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																										
			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	
RM7 Inside	Top floor E open doorway	531	0	1	0	1	2	2	1	2	1	2	0	2	3	2	2	1	0	0	0	0	1	1	0	1	0	1	
	Centre top 2m N of BE casing	532	1	2	1	2	2	2	2	0	1	0	2	3	2	1	0	0	0	0	0	0	1	1	0	0	0	1	
	Top level 1m E side entry of conveyor to chute	533	1	1	0	0	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0	1	0	1	0	0	0	0	
	Top level by top of RM7	534	2	1	0	2	0	0	0	1	0	1	1	1	1	0	3	2	0	0	0	0	1	0	1	1	0	0	
	Top level W side of chute entry end of conveyor	535	1	1	1	1	0	0	2	1	1	1	2	1	0	1	1	1	0	0	1	0	1	0	1	0	0	1	
	Top level W side of chute opening entry of conveyor	536	0	2	3	1	0	0	1	1	1	0	1	1	1	1	1	1	0	0	0	0	1	1	0	0	1	1	
	Top level centre W side platform	537	1	1	0	0	0	1	0	2	1	0	2	3	2	1	0	0	0	0	0	0	1	0	1	0	0	1	
	Top level in doorway of conveyor from RM6	538	1	2	1	1	1	1	1	2	2	0	3	3	1	2	1	0	0	0	0	0	1	0	0	0	0	0	
	On conveyor walkway on centre from RM6 at centre light	539	3	6	5	0	5	4	3	7	3	1	3	2	1	2	2	0	0	0	0	0	0	1	0	2	0	0	
	Level 3 2m N of BE casing	540	0	2	2	2	1	1	1	1	1	1	2	3	2	1	1	1	0	0	0	0	1	0	1	1	0	1	
	Level 3 between chute & duct on top of Mill	541	1	1	0	2	1	1	1	1	1	2	3	2	1	1	1	1	0	0	0	1	0	1	3	1	1	1	
	Level 2 2m N side of BE casing	542	2	1	1	0	2	1	5	2	0	1	1	1	1	2	1	1	0	0	0	0	1	0	0	1	0	1	
	Level 2 1m N of cone top of Mill by entry door	543	1	1	3	0	2	1	3	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	1	
	Level 1 2m N of BE casing is work bench	544	0	0	1	2	4	1	4	2	1	1	1	2	2	2	0	0	0	0	0	0	1	0	0	1	0	0	
	Level 1 2m to RM7 body N side	545	1	0	1	0	2	4	6	2	1	0	2	2	2	2	1	1	0	0	0	0	1	0	0	1	0	0	
	Level 1 2m W side of RM7 on platform	546	4	1	1	0	3	3	3	1	1	0	3	4	2	0	1	1	0	0	0	0	1	0	0	1	0	0	
	L0 1m E side of feeder VF100 inlet chute & RM7 body	547	0	0	0	1	1	0	2	1	2	2	0	1	1	0	1	1	0	1	0	0	1	0	0	0	1	1	
	L0 Ground Floor 3m N of BE casing	548	5	3	1	1	0	2	0	1	2	2	1	1	0	2	1	0	0	0	0	1	2	0	0	0	0	2	
	L0 Inside man door N side	549	2	1	2	1	1	3	6	2	1	1	2	0	1	0	0	0	0	0	0	1	3	0	1	1	0	2	
	L0 Inside W roll door @ 1m	550	2	2	1	7	6	1	3	2	4	1	2	1	1	0	1	0	0	0	0	0	1	0	0	1	0	1	
L0 Drive motor N @ 2m to N side & 3m to mill body	551	3	2	0	2	6	5	2	2	2	1	1	2	1	0	0	0	0	0	0	0	1	0	0	0	0	1		
L0 Drive motor S side @ 2m and RM7 body @ 2m	552	1	2	2	2	2	2	7	4	2	0	1	2	0	0	0	0	0	0	0	0	1	0	1	0	1	0		
L0 RM7 body S side @ 2m	553	2	1	3	4	7	3	4	3	3	1	1	2	0	0	0	0	0	0	0	0	1	0	1	0	1	0		
L0 NW corner 1.5m to roll door and vents	554	1	1	1	3	6	1	7	3	1	1	1	2	1	0	0	0	0	0	0	0	2	1	0	1	0	1		
RM7 bag-house hopper	On screw conveyor SC212 platform Level 1 W end side by fan motor @ 1m	555	0	2	1	2	2	0	3	3	2	0	5	4	2	0	1	2	2	0	1	2	0	1	0	0	1	0	
	Centre S side of screw in line with motor FA250	556	3	2	3	8	1	3	1	1	1	0	1	1	0	1	4	3	1	1	1	0	0	0	0	1	1		
	E end of SC212 body @ 2m and other N-S aligned screw	557	4	5	5	7	1	5	2	3	2	1	2	1	1	1	1	1	0	2	1	0	1	1	0	0	2	1	
	Main platform of baghouse hopper screws S end chute W side between SC211 & gate valve	558	1	2	1	2	1	0	2	6	2	0	1	1	1	1	1	2	2	1	1	1	0	1	0	1	3	1	
	Centre W side	559	2	3	0	0	2	1	1	2	2	0	3	3	1	0	1	1	1	0	0	1	1	2	1	1	1	0	
	Centre E side - on	560	2	3	3	4	1	3	1	1	2	2	1	2	2	0	3	3	1	1	0	0	1	2	1	1	1	1	
	N end Sc211 but S of duct	561	3	1	2	1	1	1	4	5	2	2	3	4	1	1	3	2	0	1	0	0	4	9	4	1	0	1	
	By FA252 @ 0.8m shaft S side, casing & discharge box	562	1	2	3	5	3	2	2	1	1	3	1	1	3	3	1	1	1	0	0	0	0	0	1	1	3	1	
	By FA252 @ 0.8m shaft N side, casing & inlet	563	1	4	5	5	2	3	1	0	1	6	4	1	5	7	1	2	0	1	0	0	1	0	0	0	1	1	
	Baghouse hopper platform level N end	564	4	2	3	3	1	2	0	2	1	1	2	3	1	0	3	1	1	2	1	1	1	2	1	0	0	1	
	Baghouse hopper centre platform	566	2	2	0	3	1	1	0	2	1	3	2	1	0	1	2	2	1	2	0	1	1	2	1	1	1	1	
	By FA252 @ 1m to side discharge box top grill	567	1	4	4	4	3	2	0	2	1	3	3	2	3	4	0	3	3	0	1	1	1	1	1	0	1	1	

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
Kiln 6 South Coal Road South side	30 Coal Road S side in line W side RM7	568	0	0	1	2	0	1	2	4	1	2	1	0	1	0	0	2	4	1	0	0	1	1	0	0	0	1
	31 Coal Road S side in-line E side RM7	569	1	1	2	3	0	2	1	2	1	2	2	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1
	32 Coal Road S side in-line FA249	570	1	1	1	2	1	3	3	1	2	1	2	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0
	33 Coal Road S side Centre Blending Silo	571	1	1	3	5	1	1	3	1	2	1	3	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0
	34 Coal Road S side E side PHT	572	0	1	2	4	1	2	2	2	1	2	3	1	1	0	0	0	0	0	0	0	0	1	1	0	1	0
	35 Coal Road S side E side new PHT	573	3	1	1	3	1	1	2	1	3	1	1	1	2	3	1	0	0	1	0	1	0	0	1	0	1	1
	35 Coal Road S side E side new PHT	573	2	0	1	4	1	2	4	1	3	1	2	0	1	0	0	0	0	1	0	1	0	1	0	0	1	1
	36 Coal Road S side E side drive platform	574	2	0	1	3	1	2	3	0	1	1	1	0	0	0	1	0	0	1	1	1	0	1	1	0	0	1
	36 Coal Road S side E side drive platform	574	3	0	0	3	1	0	1	1	2	0	1	1	1	1	2	1	0	1	0	1	0	0	1	1	1	1
	37 Coal Road S side centre column W support duct	575	0	0	0	1	0	1	2	2	3	0	2	2	0	1	0	0	0	1	1	1	0	0	0	1	0	0
	37 Coal Road S side centre column W support duct	575	2	1	1	1	1	0	2	1	4	2	1	1	2	2	0	0	0	0	0	1	0	0	1	0	1	2
	38 Coal Road S side centre pedestal	576	0	0	1	3	1	1	3	1	2	0	2	0	1	1	0	1	0	1	0	1	0	0	0	1	0	0
	38 Coal Road S side centre pedestal	576	1	1	0	1	2	2	0	3	5	1	2	1	2	1	0	0	0	0	0	1	0	0	1	1	1	1
	39 Coal Road S side Between centre & E pedestal	577	1	0	0	1	0	1	1	3	7	4	1	1	2	1	0	0	1	1	1	1	0	0	0	1	1	1
	39 Coal Road S side Between centre & E pedestal	577	0	0	1	2	0	1	3	1	4	3	2	1	1	1	1	1	1	1	0	1	0	1	1	1	0	0
	40 Coal Road S side E pedestal	578	0	2	1	1	1	2	2	2	5	4	1	1	2	1	0	0	0	1	0	1	0	0	0	0	0	0
	40 Coal Road S side E pedestal	578	1	1	3	3	0	3	3	1	3	2	1	0	0	1	2	1	0	1	0	1	0	1	0	0	0	0
	41 Coal Road S side W end Firing floor building	579	0	0	3	4	1	0	1	2	3	0	3	1	1	1	1	0	0	1	0	0	1	0	1	0	0	1
	41 Coal Road S side W end Firing floor building	579	2	1	0	1	1	0	2	0	3	2	2	1	2	1	0	0	0	1	0	1	0	0	0	0	0	0
	42 Coal Road S side opposite grate	580	1	1	1	0	1	1	2	2	3	0	3	1	0	0	0	0	0	1	0	0	1	1	1	1	2	1
	42 Coal Road S side opposite grate	580	1	1	0	0	0	0	1	4	6	2	2	0	1	0	1	0	0	1	0	1	0	0	0	1	1	2
	43 Coal Road S side W side coal receival bin 25m to truck	581	3	4	6	5	4	1	1	4	3	1	1	2	0	1	1	0	1	4	0	1	1	0	0	0	1	1
	43 Coal Road S side W side coal receival bin 25m to truck	581	0	1	0	2	1	1	1	2	2	2	4	0	1	1	0	0	1	2	0	0	1	1	0	0	0	0
	42' Coal Road N side opposite grate		1	2	0	1	0	0	0	3	4	1	2	0	2	1	0	0	0	1	0	0	0	0	1	1	0	1
K6 S side	43A Kerb E side CM opp CM fan discharge	404	4	2	4	2	2	4	1	0	1	4	6	0	5	6	0	2	1	1	0	0	0	1	0	1	0	1
	44A Under Coal Mill fan discharge	405	5	2	4	4	0	1	3	3	1	3	8	2	2	3	2	1	2	1	0	0	0	0	0	1	0	
	44 CM fan room roll door @ 2m	406	4	1	1	2	1	1	1	2	0	3	3	0	1	3	2	1	1	1	1	0	1	1	0	1	1	
	44 CM fan room roll door @ 2m	407	3	4	4	3	0	2	2	2	0	0	1	1	1	1	1	0	1	0	1	0	0	1	1	1	1	
	44' CM S wall E door @1m,	408	5	4	2	1	2	1	1	2	0	1	2	0	1	1	0	1	0	0	0	1	0	0	2	0	1	2
	45 CM S roll door and wall vent @ 9.9m S side	409	2	2	2	1	1	2	2	1	1	3	4	0	0	0	1	0	1	0	1	0	0	0	1	1	1	1
	46 CM room wall vent @ 2m	410	2	2	0	2	2	3	1	0	1	1	1	1	0	1	0	0	1	1	1	0	0	0	1	0	1	1
	46A Coal Mill Room S roll door W @ 1m	411	0	3	3	1	0	1	0	1	1	0	1	2	1	1	0	0	1	2	1	1	1	1	1	0	1	0
	47B Centre between Grate & CM blower room roll door	412	0	4	4	0	0	0	1	1	3	6	2	1	3	3	1	1	0	1	0	0	0	1	0	1	0	0
	47A Centre between CM Room and grate	413	1	5	8	5	1	2	1	1	2	0	1	2	2	2	0	1	1	1	0	0	1	0	1	0	1	1
	47 Opp FA264 @ 8m	414	1	3	4	1	1	3	1	0	3	3	1	0	1	1	1	1	1	0	0	0	0	1	0	1	0	1
	47C Between FA264 & FA200	415	2	2	4	3	1	2	1	1	1	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1
	47D FA 200 S Side @ 5m	416	2	0	1	1	1	0	1	0	2	2	0	0	0	0	2	1	0	0	1	3	1	0	1	1	0	
	48 Opp. E pedestal roller	417	0	2	2	1	1	1	1	0	4	6	1	0	0	0	1	0	0	0	1	3	1	0	0	0	1	0
	49 Half way between centre & E pedestals	418	0	2	2	1	1	0	1	0	3	2	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1
	50 Opp. Centre pedestal	419	1	1	0	2	1	2	0	1	3	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1
	51 Half way between Centre & Western pedestals, by duct support trestle	420	1	2	0	0	1	0	1	2	3	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
	52A Opp E end of kiln drive platform	421	1	0	0	0	0	0	1	1	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1
	52 Opp W pedestal roller	422	3	0	3	5	1	2	0	3	2	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	1
53 Kiln drive platform Centre E end on platform (ground level)	423	0	2	0	1	3	5	3	2	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																										
			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	
Kiln 6 road Northern side	54 W end RM6	595	2	1	0	0	7	15	8	1	2	3	1	0	0	0	0	0	1	0	0	1	0	0	2	1	3	5	
	55 Centre RM6	596	2	0	2	4	7	11	6	2	0	2	1	0	0	0	1	0	1	0	1	1	1	0	1	3	0	1	
	56 E End RM6	597	1	1	3	6	9	14	7	2	1	2	1	1	1	1	1	0	1	1	1	1	0	0	1	2	0	0	
	56' Between RM6 & New wall for FA38	598	2	2	3	4	8	15	8	3	0	1	0	1	0	1	1	0	1	1	1	1	0	0	0	2	0	0	
	57 Door opp FA38	599	2	1	0	5	6	7	4	1	1	1	0	2	1	0	0	0	2	2	1	0	0	0	0	2	0	0	
	58 Half way between FA38 & FA39, by big column	600	1	1	1	2	0	1	1	3	1	1	0	1	0	0	0	2	1	1	1	0	0	1	2	0	0	0	
	59 Opp FA39 end	601	4	3	1	1	1	2	3	2	0	1	1	1	0	1	1	0	0	0	1	0	0	0	1	0	0	1	
Fenceline South	Former Gate site opp W end Firing floor	582	0	1	0	1	0	1	1	2	3	0	2	0	1	2	1	0	0	1	1	1	0	0	0	0	1	0	
	Top N edge of bank opposite centre pedestal	584	0	0	0	0	1	0	1	2	3	1	2	1	0	1	1	0	1	1	0	1	0	1	0	0	1	0	
	Top N edge of bank 21m S of centre Alt Fuels Building	585	1	2	1	2	0	2	2	2	0	3	1	1	0	0	0	0	0	1	1	0	2	0	3	3	1	0	
	Top N edge bank Opposite E side old PHT	586	1	1	1	2	1	3	8	1	3	0	2	0	1	1	0	0	0	2	1	1	0	0	1	1	4	2	
	Bottom N edge of bank 13m S of centre Alt Fuels Building	587	0	0	1	1	2	3	2	4	1	2	1	0	1	1	0	1	1	2	1	0	2	2	4	7	1	1	
Kiln Drive platform	S side S motor end @ 1.5m kiln drive	424	2	0	1	3	2	1	2	2	2	1	3	1	1	2	1	1	0	0	0	0	0	0	0	1	1	0	
	S side of S Gbox @ 1.5m	425	1	0	4	6	1	2	2	0	1	1	2	1	2	3	2	1	0	0	1	0	0	0	0	2	1	0	
	E side of S drive motor @ 1.5m, 2m to Gbox	426	0	0	3	6	3	0	0	3	3	2	7	4	1	4	2	0	0	0	0	0	1	1	0	1	0	1	
	53 Kiln drive platform Centre E end on platform between motors	427	1	2	5	4	0	1	1	2	4	2	11	6	1	3	1	0	0	0	0	0	1	2	0	1	1	0	
	53 Kiln drive platform Centre E end on platform between gearboxes	428	3	1	5	4	1	0	2	0	2	2	6	3	2	5	2	0	1	0	1	0	1	1	0	1	1	0	
	N side motor end @ 1m kiln drive	429	1	0	2	3	2	0	1	0	1	3	3	1	1	3	1	0	0	0	1	1	1	1	0	1	1	0	
	N side motor N end @ 1.5m kiln drive	430	1	0	1	2	1	2	5	2	0	3	5	2	2	3	1	1	0	0	0	0	1	2	0	0	1	1	
	N side of N drive & Gbox @ 1.5m	431	1	1	3	3	1	1	3	0	0	3	4	0	3	3	0	0	0	1	1	1	0	1	0	0	0	0	
Kiln 6 road Northern side	54 W end RM6	342	7	2	1	0	0	0	0	1	2	3	1	2	4	2	2	2	1	1	1	0	0	0	1	0	0	1	
	55 Centre RM6	343	0	0	1	3	2	0	1	3	0	1	0	3	3	1	2	2	1	1	1	0	1	0	1	0	1	0	
	56 E End RM6	344	2	1	1	3	1	0	0	2	1	0	1	2	2	0	2	1	1	1	1	0	1	0	0	0	1	1	
	56' Between RM6 & New wall for FA38	345	0	0	0	1	1	1	1	2	2	1	0	2	3	1	2	1	1	0	0	0	1	0	0	0	1	1	
	57 Door opp FA38	346	1	2	1	5	2	3	2	1	4	6	2	0	1	0	2	2	3	0	1	1	0	0	1	0	1	1	
	58 Half way between FA38 & FA39, opposite big column	347	2	2	1	2	1	1	0	3	3	2	1	0	0	1	2	2	2	0	1	1	0	1	1	0	1	1	
	59 Opp FA39 end	348	2	2	0	1	2	2	2	3	3	3	2	1	1	0	2	1	2	0	0	1	0	0	1	0	1	1	
	60 Opp Conditioning Tower	349	3	1	1	2	3	2	0	2	0	2	2	0	0	0	1	1	3	1	1	1	1	1	0	0	0	1	
	60' Opp. Stack	350	1	1	1	2	2	1	0	2	2	2	2	0	0	0	1	1	2	1	0	1	0	1	1	0	1	0	
	64 E end drive platform	351	1	2	1	0	0	1	2	1	3	1	3	0	1	1	0	0	0	0	0	0	0	1	0	0	1	1	
	65 Opp column for return duct W side	352	2	2	3	1	1	0	0	1	1	1	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
	66 Opp centre pedestal	353	2	4	8	7	1	3	1	0	1	1	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	1	1
	67 Half way between centre & e pedestals	354	2	4	4	2	1	5	2	1	3	0	2	0	1	1	0	0	0	1	0	0	0	1	0	0	1	1	
	68 Opp E pedestal	355	3	1	13	8	2	6	4	5	4	0	1	1	1	1	1	0	1	1	0	0	0	1	1	0	1	1	
Grate Cooler Fan Courtyard	69 Centre courtyard - opposite F201	356	2	3	12	6	2	6	4	2	0	2	1	1	1	1	1	0	0	1	0	0	0	1	1	0	1	1	
	69 Centre courtyard - opposite F203	357	7	0	11	5	3	6	4	4	1	2	1	2	2	1	1	0	0	1	0	0	0	1	1	0	1	1	
	FA201 @ 2m	358	2	4	9	5	2	1	2	3	0	3	1	0	0	1	1	0	1	0	0	0	1	0	2	1	0	1	
	FA201 N side inlet & casing @ 1m	360	1	3	10	6	0	4	2	2	1	2	1	2	3	1	1	1	1	0	0	0	0	1	2	1	1	1	
	Between FA201 & 203 & 202	359	1	3	10	5	1	3	2	5	5	2	1	1	1	1	2	0	0	0	0	0	0	1	2	1	0	1	
	FA203 inlet & casing @ 2m	361	3	3	11	7	0	4	3	3	1	2	1	1	1	0	2	1	1	0	0	1	1	2	0	0	0	1	
	FA203,FA204 & FA205 @ 1m	362	5	1	6	3	1	6	5	3	0	1	1	1	1	0	2	0	0	1	0	0	2	5	2	1	1	0	
	Between inlet filters FA205 & FA206	363	0	4	9	6	0	5	4	3	1	2	1	1	1	0	2	1	0	1	0	0	0	1	1	1	0	1	
Grate northern area	Centre between Grate & CM blower room roll door	364	3	5	11	5	2	4	3	4	1	1	1	0	1	2	0	1	0	2	0	0	1	1	0	1	0	1	
	Coal Mill Building N roll door @ 2m	365	1	4	9	5	1	4	2	1	1	1	1	3	4	4	0	0	0	0	1	1	0	1	1	1	1	1	

Table 3.2 Kiln 6 Upgrade Frequency p.8

Table 3_2

Table 3.2A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for Kiln 6 Upgrade

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																										
			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	
Kiln Firing Floor	Centre N side opening face E	366	3	2	11	6	2	4	1	2	3	1	1	0	0	0	0	2	2	0	0	2	1	1	0	0	1	1	
	Centre N side opening face W	367	3	2	11	7	2	4	0	2	1	1	2	1	1	0	0	1	1	1	1	0	0	0	0	0	3	0	
	FA209 E side inlet & filter silencer	368	2	1	6	4	0	2	0	2	3	1	1	1	0	1	0	0	1	0	0	0	0	0	1	0	1	1	
	FA209 Kiln Discharge Seal Fan N inlet W side @ 1.5m	369	1	2	5	3	1	1	0	2	2	1	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	
	Centre S side opening face E	370	3	3	11	6	2	3	1	3	2	0	0	0	0	1	1	0	1	1	1	0	1	0	0	1	2	0	
	Centre S side opening face W	371	3	3	11	6	1	3	2	3	2	0	1	0	0	0	1	1	1	2	2	0	0	1	0	1	3	1	
	FA210 Kiln Discharge Seal Fan S inlet @ 1.5m	372	1	0	2	1	2	3	1	0	3	1	2	1	3	1	3	2	1	0	1	1	0	0	0	0	0	1	
	FA210 S side seal fan inlet W side & casing @ 1m	373	2	0	4	1	1	2	1	2	2	3	1	1	0	1	2	0	1	1	0	1	1	1	1	0	0	1	
	FA200 inlet side @ 1.5m	374	0	2	3	2	1	1	0	3	6	6	2	0	0	0	1	0	0	0	1	3	0	0	0	0	0	0	
	New replacement FA211 centre under kiln, inlet @ 1m	375	0	3	5	0	2	2	0	1	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	1	0	1	
	Kiln floor centre E S of duct/clinker elevator	376	2	2	11	6	2	4	3	3	3	1	1	1	3	1	0	2	3	0	1	0	0	0	1	0	2	0	
	KFF burner air cannon N side @ 2m	377	3	0	3	2	1	2	2	1	1	1	1	0	0	0	1	1	0	2	0	2	1	0	2	1	1	1	
KFF burner by air cannon S side @ 2m	378	3	2	4	2	0	3	2	3	1	1	1	1	1	0	1	1	1	3	1	1	1	1	1	0	2	1	0	
Radicon Cooler	RC L1 centre fan @ 1m	379	0	3	5	3	1	4	1	0	1	1	2	0	1	1	1	1	3	1	2	0	2	1	1	3	1		
	RC L1 S fan @ 0.5m	380	1	1	3	3	0	2	0	2	3	0	2	0	1	0	2	2	1	1	3	2	1	2	0	0	2	1	
	RC L1 N fan @ 1m	381	1	2	4	3	0	3	1	3	3	2	2	1	0	0	2	0	0	1	1	0	1	1	1	1	2	0	
	RC L2 centre fan @ 1m	382	2	5	8	4	1	3	1	1	2	1	1	1	1	0	2	1	1	4	0	2	0	2	1	1	3	1	
	RC L2 S fan @ 0.7m	383	1	4	8	4	0	1	0	2	3	1	1	1	1	0	1	1	1	4	1	1	1	1	0	1	3	1	
	RC L2 N fan @ 1m	384	2	4	7	5	0	2	1	2	2	1	1	0	0	1	2	1	0	1	0	0	0	1	0	1	3	0	
	RC L3 Centre fan @ 1m	385	3	5	8	4	0	2	0	1	1	1	0	1	1	0	2	1	3	6	1	2	1	1	1	1	4	1	
	RC L3 S fan @ 0.7m	386	4	5	6	4	0	1	1	1	2	0	1	1	2	1	1	1	2	6	1	2	2	0	0	1	3	1	
	RC L3 N fan @ 1m	387	2	3	5	4	0	3	0	1	2	1	0	1	1	0	2	0	0	1	0	1	0	3	2	1	4	1	
	RC L4 Centre fan @ 1m	388	2	3	6	3	1	2	1	1	1	1	1	0	0	0	1	2	3	8	1	3	1	2	2	0	3	1	
	RC L4 S fan @ 0.7m	389	6	5	6	3	1	0	1	0	1	0	1	0	0	0	1	1	4	7	0	3	2	0	0	0	1	0	
	RC L4 N fan @ 1m	390	2	5	8	4	1	1	1	2	4	1	2	1	0	1	1	0	1	2	1	1	0	3	1	0	3	1	
	RC L5 face E	391	4	5	6	3	1	2	4	2	4	1	1	0	1	1	1	0	3	6	2	1	1	1	1	0	3	1	
	RC L5 face W	392	5	6	7	4	2	3	3	2	0	1	0	1	1	0	1	0	2	5	1	1	1	1	1	0	0	1	1
	L1 E side 2.4m	393	1	3	2	2	2	2	1	1	1	1	2	0	0	1	1	0	2	4	2	1	1	0	1	1	1	1	
L1 E side 6m	394	1	3	3	2	2	2	1	0	1	1	1	1	0	1	0	1	2	6	2	1	1	1	0	1	0	1		
L1 E side 12m	395	2	4	5	3	0	2	0	1	1	1	0	0	0	0	0	0	1	3	2	0	1	0	2	1	1	1		
FA215	Motor S end @ 2.5m	396	2	4	8	6	0	3	1	0	1	0	0	0	1	0	0	1	1	0	0	0	1	4	1	1	3	2	
	Platform E side drive coupling @ casing @ 1m	397	2	1	1	1	0	2	0	0	0	1	1	3	1	1	0	0	1	1	1	1	1	1	5	3	4	4	
	W side platform @ 1m to coupling & casing	398	2	5	7	2	0	2	2	1	1	1	1	1	0	0	1	0	2	1	3	0	0	2	5	4	2	3	
	Under expansion joint discharge duct to stack @ 1m	399	1	4	4	3	2	2	1	0	2	2	1	1	0	1	0	0	1	1	1	0	1	4	4	4	2	3	
	N side inlet box platform @ 1m to discharge duct & inlet box	400	2	4	6	2	4	6	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0	1	4	3	1	2	
	Platform centre N side inlet box	401	1	1	2	2	0	3	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0	2	2	2	2	3	
	Under Inlet box W side entry duct	402	2	2	5	3	1	3	1	1	1	0	1	0	0	1	0	0	0	0	0	1	0	4	2	2	2	2	
	Inlet box N side ground level @ 1m	403	2	2	3	3	1	3	1	1	3	3	0	1	1	2	0	0	1	0	0	0	0	0	4	3	1	2	
Control Building Roof	Roof SW corner opp E end RM6	432	5	3	1	0	0	0	0	2	0	1	1	1	0	1	0	1	1	1	0	0	0	1	0	1	1	0	
	Roof SE corner opp FA38	433	3	1	3	3	0	1	0	3	1	2	2	1	0	0	0	0	1	1	1	1	0	1	0	2	2		
	Admin Building Roof NE corner opp FA502 & CM7	434	8	2	2	3	1	1	1	3	1	2	0	2	0	0	0	1	0	1	0	0	0	1	0	1	1	1	
	Roof SW corner opp E end RM6	592	2	1	1	3	2	0	1	1	0	2	1	2	0	1	0	2	0	0	0	1	0	1	0	1	0	0	
	Roof SE corner opp FA38	593	1	0	2	3	1	1	2	2	1	1	2	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	
	Admin Building Roof NE corner opp FA502 & CM7	594	1	0	1	1	0	2	1	3	3	1	0	1	0	0	0	1	1	1	1	0	1	0	0	1	0	1	

Table 3.6: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for CM7 & CM6

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
CM7	A Top of stairs S	124	33	49	49	43	49	51	53	56	60	56	57	61	65	64	63	62	62	62	60	58	56	53	49	45	41	36	30	23
	C Top of stairs N	635	30	35	40	43	49	49	51	53	57	57	58	59	63	66	62	61	61	59	58	56	54	52	48	42	36	28	19	12
	A Top of stairs S	636	33	36	46	43	49	50	51	55	59	57	59	62	65	65	62	63	63	60	59	57	56	52	49	44	37	31	24	17
	B 2m W of wall, edge of barrier facing baghouse	637	38	44	55	49	53	54	54	57	64	61	61	67	65	63	63	63	68	63	60	58	56	54	51	48	44	37	32	26
	B 2m W of wall, edge of barrier facing baghouse	637	44	52	51	51	48	49	59	65	70	66	65	69	67	67	67	67	67	66	69	67	63	62	59	57	54	50	47	41
	B' 1m S of mill motor fan discharge, @ 1.7m above ground	638	36	45	56	47	52	52	54	57	63	63	66	73	68	68	66	64	64	62	61	58	56	53	49	44	38	32	26	19
	C Top of stairs N	125	31	39	39	44	49	49	51	55	59	56	56	61	65	64	63	62	61	61	59	57	55	53	48	42	37	34	24	19
	D At corner N of Admin	126	33	41	40	42	47	47	49	52	54	54	59	61	62	69	64	64	64	61	59	56	55	53	49	43	38	33	23	20
	E Compressor room door @ 1m	128	31	45	44	42	46	48	50	56	59	56	56	58	60	61	62	61	60	58	56	53	50	47	43	39	39	39	30	23
	E' Man door to compressor filter room@ 1m	127	34	43	43	43	45	49	51	53	57	56	56	58	59	61	60	59	60	57	55	52	49	47	44	37	31	25	21	19
	F Wall vents N on W side @ 1m		35	45	43	44	49	53	55	59	64	63	63	63	66	67	67	65	64	61	61	60	57	53	50	44	36	28	22	19
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7		34	36	38	43	46	48	50	53	56	57	59	59	66	68	65	62	63	61	60	59	56	54	51	45	38	31	23	21
	I Vent S of door @ 1m		34	50	50	47	51	53	58	60	63	63	64	64	68	68	67	65	64	62	62	61	58	54	51	45	39	33	28	22
	J Vents N of baghouse		38	58	56	53	58	58	56	62	70	66	65	71	69	67	69	67	66	62	64	59	56	53	50	45	41	36	30	24
	J' Edge of concrete opp, J.		36	54	54	44	49	52	54	56	61	58	59	65	64	64	65	66	67	67	65	63	62	59	57	54	51	49	44	38
	H W roller door @ 1m	632	34	38	44	46	51	54	58	62	67	66	65	68	69	71	72	73	73	70	69	68	68	66	60	54	48	42	35	28
	H W roller door @ 1m	632	35	51	49	46	51	54	57	61	67	64	64	66	69	70	69	68	67	68	67	66	65	63	60	53	46	41	32	23
	H' Edge concrete opp door H	633	30	34	42	44	51	54	54	56	60	59	58	63	63	64	65	65	64	63	63	61	59	57	54	49	43	35	25	17
	H' Edge concrete opp door H	633	33	47	47	44	48	51	53	55	61	58	58	62	63	63	65	65	63	62	62	59	58	56	54	49	43	34	27	23
	K Line level with G centre of compressor house		28	36	39	43	45	47	49	53	58	58	59	57	63	64	65	62	61	60	58	57	55	52	51	44	38	30	22	20
	L N wall vent W side @ 1m		34	37	37	43	43	46	49	56	57	56	59	60	62	66	62	61	61	58	56	53	50	48	45	40	35	30	21	18
	M Between wall vents @ 1m to wall		32	34	38	43	42	46	48	54	57	55	56	57	61	65	63	60	59	57	56	53	51	48	44	39	33	26	20	18
	N Wall vents N wall E side @ 1m		33	34	36	41	45	48	50	55	57	57	61	60	60	62	62	60	60	58	57	53	51	49	45	40	34	27	21	18
	Bottom of stairs N	634	32	35	41	43	48	48	49	53	58	57	58	59	62	67	61	63	61	60	59	57	55	53	49	43	38	35	28	18
	O Line E side of Comp House 13.5m to control point		31	34	38	42	43	47	49	54	58	59	62	60	62	63	63	61	61	60	58	56	55	52	49	43	38	34	27	24
	P 1m N roll door CM7		41	42	44	47	48	54	59	61	65	65	66	67	71	72	71	71	70	68	67	65	64	62	57	52	45	38	30	24
	Under TS3 ground level 13.8 m from CM7		42	36	41	45	46	49	49	53	55	56	56	59	62	64	65	63	62	62	60	58	55	52	49	43	40	36	32	23
	Transfer Station #TS3 Level 1 N side opening	188	36	35	39	47	45	49	49	52	53	56	57	60	63	66	66	65	64	65	61	59	57	56	52	49	46	42	37	31
	TS3 Platform opp fan discharge	189	35	36	39	44	45	48	52	57	59	58	60	62	66	66	66	65	63	63	61	59	58	56	51	47	42	37	33	26
	R corner SW of CM7	602	33	44	47	44	54	51	53	55	61	60	59	68	68	66	63	63	63	61	60	58	57	54	50	45	39	33	27	22
	R corner SW of CM7	602	34	50	50	45	50	50	52	55	61	56	60	69	69	66	64	65	65	64	62	61	59	56	53	49	44	39	33	29
	S' Kerb Opp W wall CM7	603	34	49	48	43	49	50	52	55	64	58	59	64	64	65	66	65	65	63	63	61	58	55	51	46	40	33	26	20
	S' Kerb Opp W wall CM7	603	32	44	49	43	51	50	53	55	61	61	60	64	65	66	63	63	63	62	61	58	57	54	51	46	41	36	30	24
	S Kerb opp W side CM7 tower	604	35	36	40	42	50	50	52	54	59	59	60	64	61	62	62	63	62	61	60	58	56	54	50	46	40	33	24	15
	S Kerb opp E side CM7 tower	605	34	49	47	43	49	50	52	56	62	59	62	67	65	65	66	65	65	64	63	61	58	56	52	47	40	32	24	21
	S Kerb opp E side CM7 tower	605	33	35	39	41	48	49	51	55	60	59	59	63	62	61	64	62	62	61	61	58	56	53	49	44	38	29	19	11
	T Kerb Opp W wall CM5	606	32	46	44	43	47	50	54	58	62	59	61	65	64	64	67	66	67	65	65	63	60	57	53	47	42	37	30	22
	T Kerb Opp W wall CM5	606	33	36	40	43	49	50	52	56	60	58	60	65	62	62	63	64	65	62	61	60	57	53	49	43	36	28	19	13

Table 3.6: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for CM7 & CM6

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																											
			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
CM7 Inside	H* Inside main W roll door @ 1m	435	38	50	49	54	57	60	64	69	76	79	78	82	85	86	86	85	84	83	83	82	82	81	79	74	69	63	56	48
	F* Inside NW corner	436	41	50	49	52	52	56	63	67	73	76	77	78	79	83	83	83	82	82	80	79	78	76	72	67	61	54	46	37
	I* W side by hydraulics bench	437	38	46	49	52	56	63	69	71	76	78	78	83	84	88	85	83	84	81	81	80	82	78	78	72	66	59	52	44
	J* inside vents	438	40	53	52	54	57	60	65	69	75	75	76	81	81	84	83	81	82	79	80	78	78	75	72	67	61	54	47	39
	J* SW corner by vents at baghouse	439	40	55	51	51	53	59	63	68	75	74	74	82	79	80	80	79	78	77	77	75	74	71	68	63	58	50	44	37
	N end under centre axis, groundlevel	446	34	42	42	46	54	63	69	72	76	78	80	79	81	87	86	87	88	87	86	86	84	82	79	73	69	63	56	48
	N end ground @ 2m	440	38	45	42	48	53	63	66	70	74	76	77	79	81	84	85	85	85	85	83	82	81	78	75	70	64	57	50	41
	Centre axis N end @ 2m	441	39	53	49	50	55	63	70	74	80	79	83	84	85	87	88	89	89	89	87	87	86	83	80	75	70	64	56	47
	Inside Door P N end of mill building @ 1m	442	34	45	45	52	55	64	64	68	74	76	77	80	82	84	85	85	84	83	82	82	81	79	76	71	65	59	51	43
	Inside E side mill centre at columns N end	443	35	46	48	52	58	64	68	71	76	78	80	85	87	87	88	89	89	90	90	91	90	89	86	81	76	71	63	56
	Inside E side mill centre at columns S end	444	37	48	48	52	59	65	68	72	75	77	80	84	88	90	89	88	87	87	86	85	85	83	81	77	72	68	62	55
	Inside NW corner mill room	445	41	54	50	52	51	57	62	67	74	77	77	78	79	83	83	83	82	81	80	79	78	76	72	67	62	56	47	38
	C701 platform	447	36	48	46	48	54	60	65	70	76	76	77	77	78	82	82	83	81	81	80	80	79	76	73	68	62	56	50	42
	Platform above centre centre mill	448	36	44	44	49	57	64	67	71	75	77	79	80	80	82	82	82	81	81	81	80	80	78	75	70	64	58	52	43
	Inside, above Mill drive gear S end	449	34	49	48	50	56	62	66	70	75	76	77	82	80	80	81	80	82	79	79	77	76	73	70	66	60	54	48	40
	Tower stairs at roof level	450	40	52	48	50	54	58	64	66	72	74	76	77	77	80	80	80	80	79	79	78	76	73	70	65	59	52	45	36
	1st platform above roof level in BE tower W side	451	37	50	46	49	54	57	61	66	72	73	73	76	75	76	77	75	75	73	73	71	70	67	64	60	56	50	44	40
	2nd platform in BE tower by fans FA703 & FA720, W side wall @ 1m	452	40	48	46	48	51	56	59	63	69	70	70	72	74	73	73	72	71	70	70	68	67	65	62	61	56	53	46	41
	Between Fans FA703 on & FA720 on	453	35	50	47	48	51	59	62	64	67	70	71	72	74	74	74	73	73	73	73	71	70	67	65	64	62	61	57	52
	At crossway to CM5 level, N side at transfer to conveyor	454	38	40	42	47	53	60	61	64	68	68	69	71	72	71	72	72	70	70	69	67	67	65	62	63	58	53	45	38
	At crossway to CM5 level, W side by wall @ 1m, BE @ 1.8m	455	39	43	41	48	51	57	60	63	67	68	69	71	72	72	72	72	71	70	70	68	67	66	63	63	58	55	46	39
	At W end crossway to CM5 by vent in S wall	456	37	39	42	49	52	57	61	62	66	65	67	69	68	68	68	68	68	67	66	64	63	62	58	58	53	48	39	33
	Top level BE tower W side NW corner	459	39	45	44	47	50	54	60	63	68	68	68	69	77	71	71	71	71	71	70	69	70	69	67	69	65	61	53	44
	Top level BE tower S side BE @ 0.8m	460	41	44	45	50	53	60	62	62	63	68	67	69	72	70	71	71	69	70	69	69	69	69	70	72	67	64	55	50
	Top level BE tower E side by drive motor end @ 0.8m	461	40	49	46	50	51	61	65	63	64	68	69	72	74	71	72	74	73	74	72	71	71	70	66	68	63	60	52	44
	Top level BE tower N side by drive motor end @ 0.8m	462	41	52	47	46	51	57	60	62	66	69	68	70	74	72	72	76	73	74	71	70	70	69	66	67	63	59	51	43
	Crossway to CM5 E end by opening in floor	457	36	42	43	52	57	58	60	63	66	68	68	66	67	65	63	62	61	61	60	58	57	56	55	54	49	45	42	37
	Crossway to CM5 by centre S wall vent	458	40	41	44	49	52	56	59	59	64	63	64	65	66	67	67	66	66	65	64	62	61	59	56	55	50	46	38	33
	Main baghouse SE corner top, 4m to E wall	464	37	55	53	49	53	59	59	65	70	72	72	73	72	73	73	73	73	71	72	69	67	64	61	58	53	48	45	39
	Main baghouse NE corner top, 4m to E wall	465	37	45	44	46	54	58	61	65	70	73	74	75	73	75	74	74	74	72	73	69	68	65	61	57	53	46	41	35
	Base of main baghouse SW corner	463	39	59	57	49	54	56	60	64	72	73	73	76	76	76	75	74	74	73	73	70	68	65	63	63	59	51	47	41
	CM7 FA701 motor & casing NE side @ 1.5m	467	39	53	51	57	65	67	68	68	75	73	73	79	78	78	79	79	79	78	79	74	73	70	70	75	72	64	62	57
	Compressor house inside W man door	468	39	39	40	43	42	47	57	65	63	64	64	67	71	70	71	74	76	78	79	81	85	85	88	89	87	84	79	73
	Compressor house inside by centre purge filter	469	37	34	38	43	46	52	58	62	64	61	61	63	67	66	65	68	70	72	73	75	81	79	83	83	83	78	72	66
	Compressor house inside E man door	470	37	37	37	44	45	52	58	60	63	63	62	62	65	64	63	65	65	64	63	62	60	57	54	50	45	42	40	34
	Compressor house inside centre	471	37	34	38	44	46	52	59	68	64	63	65	64	68	64	64	65	65	64	63	62	60	57	55	53	51	50	48	44
	Compressor house inside W man door	472	34	37	38	43	47	50	58	65	62	62	64	63	64	64	64	65	65	64	63	61	60	59	56	55	54	51	46	40
	E Outside W roll door compressor house	473	30	45	41	43	46	49	51	54	58	57	56	59	61	61	61	61	61	59	56	53	50	47	44	39	34	29	24	19
	SW side of mill motor fan @ 2m to casing inlet & discharge ducts	466	41	55	51	52	61	61	61	67	71	72	72	77	76	75	75	75	75	74	75	72	70	67	65	66	63	55	51	45

Table 3.6: Boral Cement Berrima Annual Noise 2019: One-third Octave Band Frequency sound levels for CM7 & CM6

Area	Location	File No	Sound Level LAeq,t in One Third Octave Frequency Band Hz																												
			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	
CM6	1 North West Corner @ 1m		52	45	50	57	51	54	55	60	64	65	65	67	69	69	70	70	69	69	67	66	63	60	55	51	45	39	31	25	
	2 Front of Roller Door @ 1m	626	49	41	44	53	54	58	61	66	67	68	72	76	77	76	77	76	76	77	77	77	76	73	69	65	60	54	49	42	
	2 Front of Roller Door @ 1m	626	47	41	48	55	53	54	57	60	65	66	68	69	69	71	72	71	71	70	68	66	64	61	57	52	47	40	33	27	
	3 Between Door @ 1m	627	41	43	49	52	49	52	55	59	63	63	66	68	70	69	70	70	68	68	66	64	61	59	55	50	45	38	31	24	
	3 Between Door @ 1m	627	42	43	48	52	50	52	54	60	64	64	68	69	69	70	71	71	70	69	68	67	66	63	59	54	49	43	37	31	
	4 Front of Roller Door @ 1m	628	42	41	47	53	52	54	57	61	66	67	69	71	73	72	73	71	70	69	68	66	65	63	59	55	48	42	35	28	
	4 Front of Roller Door @ 1m	628	43	42	47	53	52	55	57	61	66	67	68	71	73	72	73	72	70	69	68	66	65	62	58	53	47	41	33	26	
	5 Front of Southern Roller Door @ 1m	629	39	40	45	52	54	55	57	61	65	65	69	70	70	71	71	70	69	68	67	65	62	59	55	51	46	39	33	26	
	5 Front of Southern Roller Door @ 1m	629	41	40	46	52	52	54	57	61	66	67	69	70	71	72	72	71	70	68	66	64	61	56	52	48	42	35	27	19	
	6 Northern face of western ext. @ 1m		39	41	46	53	47	47	52	60	64	66	64	67	68	69	69	67	66	66	65	63	59	56	52	47	41	35	27	19	
	7 On CM5 Platform (N) @ 6.8m		38	38	42	50	49	52	55	58	62	62	62	65	66	67	69	68	68	68	66	63	60	58	55	48	41	34	27	22	
	8 Western face (N) of western ext. @ 1m		46	41	48	49	52	54	54	56	60	62	63	64	67	67	68	67	67	66	65	63	59	56	51	45	39	32	25	19	
	9 Western face(S) of western ext. @ 1m		45	42	43	50	51	50	53	56	60	60	62	63	64	66	68	68	67	66	65	62	59	56	52	46	39	31	24	18	
	10 On CM5 Platform (S) @ 6.8m	607	40	38	41	48	49	51	54	56	60	59	60	64	63	64	66	66	67	65	64	61	59	55	52	46	39	30	21	14	
	10 On CM5 Platform (S) @ 6.8m	607	41	36	44	51	49	53	55	58	61	60	61	64	65	67	68	68	69	67	66	63	60	57	53	47	41	34	27	19	
	11 14.5m from S wall at joint	608	29	35	38	48	50	52	54	58	61	58	61	63	62	64	66	69	68	65	64	62	61	58	54	48	41	34	27	23	
	11 14.5m from S wall at joint	608	29	33	38	44	48	51	53	58	60	59	62	64	62	63	66	72	73	65	64	62	62	58	56	52	42	35	26	18	
	12 6m from S wall CM6 at joint	609	31	33	36	45	54	53	53	57	62	60	61	65	63	64	67	74	76	68	66	65	66	62	61	55	47	40	31	25	
	12 6m from S wall CM6 at joint	609	30	34	39	43	51	50	53	59	61	59	61	68	63	63	66	70	75	69	67	67	67	62	62	57	47	40	31	23	
	13 E side S roll door @ 1m	610	30	33	38	43	45	48	52	55	59	61	63	74	63	62	64	67	65	64	63	61	59	56	51	45	39	32	25	18	
	13 E side S roll door @ 1m	610	32	34	38	44	50	50	54	57	61	64	64	71	66	64	66	67	68	65	64	62	64	60	54	47	42	37	29	20	
	14 CM6 E side centre door @ 1m	611	33	35	39	45	48	53	57	62	65	67	69	70	70	69	69	68	66	65	65	63	62	60	56	52	47	42	36	29	
	14 CM6 E side centre door @ 1m	611	35	36	41	46	52	57	62	65	69	71	71	74	76	74	74	75	73	72	72	71	69	68	67	66	64	61	57	51	
	15 2m from Clinker Building opp 13 & 14	612	28	34	39	42	45	49	50	56	59	60	61	62	63	64	65	66	65	66	63	61	59	56	52	47	41	35	30	23	
	15 2m from Clinker Building opp 13 & 14	612	30	31	39	43	47	51	55	57	61	65	65	68	67	65	66	65	67	66	64	62	61	58	55	52	49	46	42	35	
	16 E wall centre @ 2m	613	29	32	37	43	44	49	52	56	60	61	64	64	65	65	65	64	64	64	64	62	60	58	55	51	47	43	39	34	27
	16 E wall centre @ 2m	613	32	32	37	42	45	50	54	57	61	64	65	67	66	67	66	64	64	64	64	63	61	60	58	56	55	55	52	50	42
	17 E roll door opp Mill	614	31	33	39	46	48	52	55	60	63	64	68	70	74	73	72	72	73	75	74	70	68	68	63	59	56	52	45	37	
	17 E roll door opp Mill	614	32	34	40	46	48	51	55	60	62	65	66	71	73	72	71	70	71	74	72	69	67	67	61	58	55	51	45	36	
	18 Door opp Comp Room @ 1m	615	30	31	37	42	45	48	51	57	61	60	62	64	65	66	67	67	68	71	69	72	68	66	63	59	54	51	47	44	
	18 Door opp Comp Room @ 1m	615	31	32	39	45	46	48	52	58	61	61	62	65	66	70	68	66	70	76	67	71	72	64	62	61	55	49	44	38	
	19 Clinker Building @ 2m opp 18	616	33	32	36	42	43	48	51	56	59	59	62	64	63	62	65	66	67	66	63	63	61	59	55	51	46	39	33	26	
	19 Clinker Building @ 2m opp 18	616	29	32	38	45	44	48	52	55	58	61	61	64	64	65	63	63	65	65	64	61	61	57	55	51	48	44	37	31	
	20' Inside Filter Room @0.3m		35	38	38	45	42	49	56	62	62	63	63	65	63	64	65	65	66	63	62	62	61	59	56	54	51	47	41	35	
	20 Man door - open 100mm	617	31	32	36	40	43	48	51	55	59	60	62	62	61	63	67	63	63	65	61	62									

Table 3.6A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for CM7 & CM6

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																										
			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	
CM7	A Top of stairs S	124	8	3	6	2	0	1	1	4	3	2	0	2	0	0	0	0	1	0	0	1	0	0	0	0	1	0	
	C Top of stairs N	635	0	1	2	4	1	0	0	2	1	0	2	1	3	2	0	0	0	0	0	1	1	1	0	1	0	1	
	A Top of stairs S	636	4	7	5	3	0	1	0	3	2	1	0	2	2	2	0	2	1	1	0	1	0	1	1	0	0	0	
	B 2m W of wall, edge of barrier facing baghouse	637	2	8	5	1	0	1	2	5	2	3	4	0	1	0	2	5	1	0	0	1	0	1	0	2	1	1	
	B 2m W of wall, edge of barrier facing baghouse	637	5	1	2	2	5	1	1	5	2	3	3	1	0	0	0	0	2	3	0	1	1	0	0	1	1	2	
	B' 1m S of of mill motor fan discharge, @ 1.7m above ground	638	2	11	7	2	1	1	2	4	2	2	6	3	1	1	1	1	1	1	0	0	1	0	0	0	0	0	
	C Top of stairs N	125	4	3	0	2	1	1	0	4	2	2	0	3	0	1	0	0	1	0	0	0	1	1	1	1	3	2	
	D At corner N of Admin	126	4	1	2	3	1	0	0	1	2	1	1	3	6	2	0	2	1	0	0	0	1	1	1	1	0	2	3
	E Compressor room door @ 1m	128	8	0	2	1	0	2	1	3	1	1	0	1	0	1	0	0	0	1	0	0	1	0	2	0	5	1	
	E' Man door to compressor filter room@ 1m	127	4	0	1	0	1	0	1	3	1	1	0	1	2	0	1	2	0	0	0	0	1	2	0	0	1	1	
	F Wall vents N on W side @ 1m		6	1	2	0	1	1	1	3	1	0	1	1	0	1	0	1	1	0	1	0	0	2	1	0	2	1	
	G - Line N side of transfer house 13.5m to it, in-line W edge CM7		0	2	1	0	1	1	1	1	1	1	4	3	2	0	1	1	0	0	1	0	0	2	0	1	0	3	
	I Vent S of door @ 1m		8	2	4	1	2	1	0	2	1	1	2	2	1	1	0	1	1	1	1	0	1	2	0	0	0	0	
	J Vents N of baghouse		11	0	3	2	1	3	1	6	2	4	4	0	1	2	1	2	3	3	1	0	0	1	0	0	1	0	
	J' Edge of concrete opp, J.		9	5	8	1	1	1	1	4	2	3	3	0	0	1	1	0	1	0	1	1	0	0	0	0	1	1	
	H W roller door @ 1m	632	0	2	2	1	0	0	1	4	0	2	1	0	1	1	1	2	1	0	0	1	2	0	0	0	0	0	
	H W roller door @ 1m	632	9	1	4	1	0	0	1	4	1	1	1	1	1	0	1	1	1	0	0	0	1	2	0	1	2	0	
	H' Edge concrete opp door H	633	2	3	3	2	2	1	1	3	0	2	2	0	0	0	1	0	1	1	0	0	1	1	1	1	1	1	
	H' Edge concrete opp door H	633	7	2	4	1	1	0	2	4	1	2	1	1	1	1	1	0	1	1	0	0	1	1	0	1	1	2	
	K Line level with G centre of compressor house		2	0	1	0	0	1	0	2	0	2	4	2	0	2	1	0	0	0	0	0	0	2	0	1	0	3	
	L N wall vent W side @ 1m		2	3	3	1	0	2	3	1	2	1	0	2	5	1	1	2	0	0	0	0	1	1	0	0	2	3	
	M Between wall vents @ 1m to wall		1	0	3	2	1	2	1	2	1	0	1	0	3	0	1	1	0	0	0	0	1	1	0	1	0	2	
	N Wall vents N wall E side @ 1m		1	2	1	1	0	2	1	1	2	2	1	1	1	1	1	0	0	1	1	0	1	0	0	1	0	2	
	Bottom of stairs N	634	1	2	2	3	1	1	1	3	1	0	1	1	5	4	2	0	0	0	0	1	1	1	0	2	2	1	
	O Line E side of Comp House 13.5m to control point		1	0	2	1	1	2	1	1	0	3	2	1	1	1	1	1	0	0	0	1	0	2	0	0	1	2	
	P 1m N roll door CM7		0	1	1	3	1	1	1	2	0	0	2	2	1	0	0	0	0	0	0	1	1	1	1	0	1	1	
	Under TS3 ground level 13.8 m from CM7		6	0	2	1	2	2	1	1	0	1	0	1	0	2	1	0	1	0	1	0	1	1	1	1	1	3	
	Transfer Station #TS3 Level 1 N side opening	188	2	2	5	3	2	2	1	1	1	1	0	0	2	1	0	1	2	1	0	1	1	1	0	1	1	1	
	TS3 Platform opp fan discharge	189	1	1	2	1	1	0	2	1	1	0	1	2	0	0	0	1	1	0	1	0	2	0	0	0	1	2	
	R corner SW of CM7	602	4	3	6	6	2	0	2	3	0	5	4	1	1	2	0	1	0	0	0	0	1	1	0	0	0	0	
	R corner SW of CM7	602	8	3	5	3	1	0	2	5	4	3	5	1	0	2	1	1	1	0	0	0	0	1	0	1	0	0	
	S' Kerb Opp W wall CM7	603	8	2	6	3	1	0	3	7	3	2	2	1	1	0	0	0	0	1	0	0	1	0	1	0	0	1	
	S' Kerb Opp W wall CM7	603	3	6	7	4	2	1	2	3	0	2	2	0	2	2	0	0	1	0	0	0	1	0	0	0	1	0	
	S Kerb opp W side CM7 tower	604	1	1	3	4	1	0	1	2	0	2	3	2	0	0	1	0	0	1	0	0	1	0	1	1	1	0	
	S Kerb opp E side CM7 tower	605	9	1	5	2	0	1	1	5	3	1	4	1	1	1	1	1	0	1	0	0	0	1	0	1	0	2	
	S Kerb opp E side CM7 tower	605	1	1	2	2	0	1	0	4	1	2	3	1	1	2	1	1	0	1	0	0	1	0	1	1	1	1	
	T Kerb Opp W wall CM5	606	8	1	2	1	1	0	0	4	3	1	2	0	1	1	1	2	1	1	0	0	0	1	0	0	1	1	
	T Kerb Opp W wall CM5	606	0	0	1	2	1	1	0	3	2	1	3	1	1	0	0	2	1	0	1	0	1	1	1	1	0	2	

Table 3.6A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for CM7 & CM6

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																									
			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
CM7 Inside	H* Inside main W roll door @ 1m	435	7	3	1	0	0	1	1	2	2	2	1	1	0	1	0	0	0	0	1	1	1	0	1	0	0	
	F* Inside NW corner	436	6	2	2	2	1	1	1	2	1	0	0	1	1	0	1	1	1	1	0	1	0	1	0	1	1	0
	I* W side by hydraulics bench	437	3	0	1	1	1	1	1	1	1	3	2	2	4	1	1	2	1	0	1	2	2	3	0	1	0	0
	J* inside vents	438	7	2	1	0	0	0	0	3	0	2	3	2	3	0	2	3	2	1	1	1	0	1	1	1	0	1
	J* SW corner by vents at baghouse	439	9	2	2	2	1	0	1	4	1	4	5	1	0	1	0	0	1	2	0	1	0	1	0	1	0	0
	N end under centre axis, groundlevel	446	4	2	2	0	1	2	0	1	0	1	2	1	3	1	0	1	0	1	1	0	1	1	0	1	0	0
	N end ground @ 2m	440	5	4	1	3	3	0	0	1	1	1	0	1	1	1	0	0	1	0	0	0	1	1	0	1	0	1
	Centre axis N end @ 2m	441	9	2	2	1	1	1	1	4	3	1	0	1	1	1	1	0	0	0	0	1	1	1	0	1	1	0
	Inside Door P N end of mill building @ 1m	442	6	4	2	3	5	2	1	2	0	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	1	0
	Inside E side mill centre at columns N end	443	4	1	1	0	1	0	1	2	0	2	1	2	1	0	0	0	1	0	1	0	1	1	0	0	1	0
	Inside E side mill centre at columns S end	444	5	2	2	0	2	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	1
	Inside NW corner mill room	445	8	3	2	3	0	0	1	2	2	0	0	2	3	0	1	0	0	0	0	0	0	1	0	1	1	0
	C701 platform	447	7	2	2	1	0	1	1	3	1	1	1	1	2	1	1	1	1	0	0	1	0	1	0	0	0	1
	Platform above centre centre mill	448	4	3	1	0	3	1	0	1	0	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	1
	Inside, above Mill drive gear S end	449	8	2	2	0	1	0	1	2	0	2	3	1	0	1	1	2	1	0	0	1	0	1	1	1	1	1
	Tower stairs at roof level	450	8	3	1	0	1	2	2	2	1	0	1	1	1	0	1	1	0	0	0	0	0	1	1	1	0	1
	1st platform above roof level in BE tower W side	451	8	3	1	1	0	1	1	3	0	1	2	1	0	1	1	1	1	1	0	1	0	0	1	1	0	1
	2nd platform in BE tower by fans FA703 & FA720, W side wall @ 1m	452	5	2	0	1	1	0	1	2	1	1	0	2	1	1	0	0	1	1	1	0	1	1	2	1	2	1
	Between Fans FA703 on & FA720 on	453	9	2	1	3	2	1	0	0	1	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	1	0
	At crossway to CM5 level, N side at transfer to conveyor	454	0	2	0	1	3	1	1	2	0	1	1	1	1	1	1	1	0	1	1	0	1	2	3	1	2	0
	At crossway to CM5 level, W side by wall @ 1m, BE @ 1.8m	455	4	4	1	1	2	0	1	2	0	0	0	0	0	0	0	1	1	1	1	0	1	2	3	1	2	1
	At W end crossway to CM5 by vent in S wall	456	0	2	2	1	1	1	1	2	1	1	2	1	0	0	0	1	0	0	1	0	1	1	2	0	2	1
	Top level BE tower W side NW corner	459	4	2	0	1	1	2	1	3	0	1	3	7	3	0	0	0	1	0	1	1	1	3	4	0	2	0
	Top level BE tower S side BE @ 0.8m	460	2	3	2	2	3	1	1	2	3	1	1	2	2	1	0	1	0	0	0	0	0	1	4	1	3	1
	Top level BE tower E side by drive motor end @ 0.8m	461	6	4	1	4	3	3	2	1	1	1	0	2	2	0	1	1	2	1	1	1	1	2	3	1	2	0
	Top level BE tower N side by drive motor end @ 0.8m	462	8	2	3	1	1	1	1	0	2	2	1	3	1	2	3	2	2	1	1	1	1	2	3	1	2	0
	Crossway to CM5 E end by opening in floor	457	3	4	2	2	1	1	0	0	1	1	2	2	0	0	0	1	0	0	0	0	0	0	2	0	1	2
	Crossway to CM5 by centre S wall vent	458	1	1	1	1	1	1	2	2	1	0	0	0	1	0	0	1	0	1	0	0	1	1	1	0	2	1
	Main baghouse SE corner top, 4m to E wall	464	10	1	4	1	3	3	1	1	1	1	2	2	1	0	0	1	2	2	1	0	0	0	1	0	1	1
	Main baghouse NE corner top, 4m to E wall	465	5	1	3	2	0	0	1	1	1	1	1	1	1	0	0	1	2	2	1	0	0	0	1	1	1	0
	Base of main baghouse SW corner	463	11	3	7	2	1	1	2	3	1	1	1	0	0	0	1	1	0	1	0	0	0	1	2	2	2	1
	CM7 FA701 motor & casing NE side @ 1.5m	467	8	4	1	3	1	0	3	4	1	3	4	1	1	1	0	0	1	3	1	0	1	2	4	2	3	2
	Compressor house inside W man door	468	0	2	2	3	2	1	5	1	0	1	1	3	1	1	0	0	1	1	0	2	1	1	1	1	1	0
	Compressor house inside by centre purge fiter	469	4	1	1	1	0	1	1	2	1	1	1	3	1	1	0	0	1	0	2	3	2	2	0	2	1	1
	Compressor house inside E man door	470	0	3	3	3	1	2	1	1	0	0	2	3	1	1	1	1	0	0	1	0	0	1	0	1	0	2
	Compressor house inside centre	471	3	1	2	2	1	1	7	1	2	2	3	5	2	1	1	0	0	0	0	0	0	0	0	0	0	1
	Compressor house inside W man door	472	1	1	0	0	2	0	5	1	1	2	2	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1
	E Outside W roll door compressor house	473	9	3	1	1	0	1	0	3	0	2	1	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0
	SW side of mill motor fan @ 2m to casing inlet & discharge ducts	466	9	3	4	4	0	3	1	1	1	3	3	0	0	0	0	0	1	2	1	0	0	1	2	2	2	1

Table 3.6A: Boral Cement Berrima Annual Noise 2019: Tonality in One-third Octave Band Frequency sound levels for CM7 & CM6

Note: Pink shaded cells indicate tonality exceeds criteria for the band

Area	Location	File No	LAeq Tonality in One-third Octave Band - dB																										
			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	
CM6	1 North West Corner @ 1m		6	1	7	4	1	1	0	1	1	1	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	1	
	2 Front of Roller Door @ 1m	626	5	3	4	1	0	1	2	0	1	1	2	1	1	1	0	1	1	0	0	1	0	0	0	1	0	1	
	2 Front of Roller Door @ 1m	626	6	0	5	2	1	0	1	2	1	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	
	3 Betgeen Door @ 1m	627	1	1	3	3	0	1	0	2	1	1	0	1	1	1	0	0	1	0	0	0	0	1	0	1	0	0	
	3 Betgeen Door @ 1m	627	2	1	3	2	0	2	1	2	2	1	1	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	
	4 Front of Roller Door @ 1m	628	3	0	4	1	1	1	0	2	1	0	0	1	1	1	0	0	0	1	1	1	0	0	1	0	0	1	
	4 Front of Roller Door @ 1m	628	3	1	4	2	0	1	0	2	0	1	1	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	
	5 Front of Southern Roller Door @ 1m	629	2	1	3	0	1	1	0	1	1	1	1	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	
	5 Front of Southern Roller Door @ 1m	629	4	0	3	1	0	1	1	2	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	1	0	1	
	6 Northern face of western ext @ 1m		2	1	6	3	3	1	2	1	2	2	1	0	0	2	1	0	0	0	1	0	0	1	0	1	1	0	0
	7 On CM5 Platform (N) @ 6.8m		2	2	5	2	1	1	0	2	1	1	1	0	0	1	0	0	1	0	0	0	0	2	0	0	0	1	
	8 Western face (N) of western ext @ 1m		6	2	0	0	1	1	1	2	0	0	1	2	1	1	0	0	0	0	1	0	1	1	0	1	0	1	
	9 Western face(S) of western ext @ 1m		2	3	3	1	2	0	1	2	1	0	0	0	1	2	0	0	0	1	0	0	1	1	0	1	0	1	
	10 On CM5 Platform (S) @ 6.8m	607	3	1	3	1	0	0	0	2	1	1	2	0	1	1	0	1	0	1	0	0	0	1	1	1	0	1	
	10 On CM5 Platform (S) @ 6.8m	607	6	0	5	3	1	0	0	2	1	1	1	1	0	1	0	1	0	0	1	0	0	1	0	1	0	0	
	11 14.5m from S wall at joint	608	1	4	4	1	0	1	1	3	3	0	2	1	0	0	2	1	1	1	1	2	0	1	1	0	0	2	
	11 14.5m from S wall at joint	608	1	0	1	0	1	2	1	2	2	0	3	2	1	2	3	4	3	0	1	2	1	1	3	1	1	0	
	12 6m from S wall CM6 at joint	609	0	3	0	5	1	2	0	3	1	1	3	1	1	2	3	5	3	1	0	2	1	3	0	0	1	1	
	12 6m from S wall CM6 at joint	609	1	1	2	5	2	1	1	2	2	2	5	2	1	1	0	5	2	1	0	3	3	2	2	1	1	0	
	13 E side S roll door @ 1m	610	1	0	2	1	1	1	1	1	0	5	11	5	1	0	2	0	0	1	0	1	1	1	0	1	0	0	
	13 E side S roll door @ 1m	610	1	0	1	3	2	0	0	0	1	3	6	2	2	0	0	2	1	1	2	3	1	0	1	0	1	1	
	14 CM6 E side centre door @ 1m	611	1	1	2	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	
	14 CM6 E side centre door @ 1m	611	2	0	0	1	0	1	0	1	1	2	1	2	1	0	1	1	0	0	0	0	0	1	0	1	0	1	
	15 2m from Clinker Building opp 13 & 14	612	1	1	0	0	1	2	1	1	0	0	1	0	0	1	0	1	2	0	0	0	0	0	1	0	0	1	
	15 2m from Clinker Building opp 13 & 14	612	3	2	0	0	0	1	1	0	2	2	2	1	1	0	1	1	1	1	0	1	0	0	0	0	0	1	
	16 E wall centre @ 2m	613	1	1	3	2	1	0	0	1	0	1	0	0	0	1	1	0	1	1	1	1	0	0	0	0	0	1	
	16 E wall centre @ 2m	613	3	0	1	1	0	1	0	0	1	0	1	1	1	0	0	0	0	1	0	1	0	1	0	1	1	3	
	17 E roll door opp Mill	614	2	0	2	1	1	1	1	1	1	1	1	2	0	0	0	1	2	1	1	1	2	0	1	0	2	1	
	17 E roll door opp Mill	614	2	0	2	1	0	1	2	0	1	2	2	1	0	0	1	1	2	1	0	1	3	1	0	0	2	1	
	18 Door opp Comp Room @ 1m	615	3	1	1	0	0	1	1	2	1	0	0	0	0	1	1	1	3	3	4	1	1	1	0	1	1	1	
	18 Door opp Comp Room @ 1m	615	3	0	2	0	1	0	1	1	0	1	1	1	3	0	3	1	7	6	1	4	3	0	2	0	0	0	
	19 Clinker Building @ 2m opp 18	616	3	1	2	1	0	0	1	1	1	0	2	0	2	1	1	0	2	2	1	0	2	0	1	1	1	1	
	19 Clinker Building @ 2m opp 18	616	2	0	4	3	0	0	1	0	1	1	1	0	1	1	1	1	0	1	1	2	1	0	0	1	1	0	
	20' Inside Filter Room @0.3m		2	4	5	5	0	1	3	0	1	1	3	2	0	1	0	2	1	0	0	1	1	1	1	1	1	0	
	20 Man door - open 100mm	617	1	0	1	1	1	0	0	1	0	1	1	2	1	4	2	1	3	2	1	1	1	1	1	0	0	1	
	20 Man door - open 100mm	617	2	1	1	1	1	1	0	1	1	1	1	1	2	0	1	2	3	2	4	3	2	1	1	1	2	2	
	21 1m Outside vent fan filter louvre	618	3	3	5	3	2	0	1	1	0	1	1	0	0	1	1	1	1	0	0	0	0	1	0	0	1	3	
	21 1m Outside vent fan filter louvre	618	2	5	4	3	1	2	2	2	1	1	2	2	2	1	0	1	0	1	0	1	1	1	2	0	0	1	
	22 E side N wall vent @ 1m	619	1	1	1	4	4	1	1	1	1	1	3	1	0	1	1	1	1	1	1	0	1	0	0	0	1	2	
	22 E side N wall vent @ 1m	619	3	0	1	4	4	1	2	1	0	2	2	1	1	0	0	0	0	0	0	1	0	1	2	0	1	1	
	23 Centre N wall vent @ 1m	620	0	0	1	3	4	2	2	0	1	0	1	2	1	1	1	0	0	1	0	1	1	1	2	0	0	0	
	23 Centre N wall vent @ 1m	620	1	0	1	3	4	1	1	0	0	1	2	1	0	0	1	0	1	0	0	1	0	1	1	0	1	2	
	24 W side N wall vent @ 1m	621	4	0	3	2	1	0	0	1	1	1	0	2	0	1	1	1	0	0	1	0	0	0	1	0	0	0	
	24 W side N wall vent @ 1m	621	3	0	2	2	1	0	1	0	2	1	0	2	1	2	1	0	1	0	0	1	0	0	1	0	2	3	
	25 11m N of CM6 at joint	622	5	1	5	5	2	1	2	0	0	0	1	1	2	1	0	0	1	1	0	1	1	2	2	1	1	2	
	25 11m N of CM6 at joint	622	5	1	3	3	1	0	1	0	0	0	2	1	0	1	1	2	1	0	1	0	1	1	1	0	0	1	
	26 22.6m N of CM6	623	6	1	4	0	1	3	1	0	1	2	1	1	0	0	0	1	2	1	2	2	0	1	1	1	0	1	
	26 22.6m N of CM6	623	6	2	5	5	1	1	2	0	0	2	3	1	0	2	1	0	2	1	1	1	0	0	0	1	2	1	
	27 4m N of Conveyor transfer out of Clinker Building	624	2	1	10	6	0	1	0	0	1	1	0	0	2	1	1	1	1	1	0	0	1	0	1	0	0	1	
	28 4m N of dust collector on next building W , conveyor transfer noise	625	4	3	10	6	3	1	0	0	0	1	1	1	0	1	2	2	0	0	0	0	1	0	0	1	0	0	
	Door platform near CM6 W wall fan @ 7m	190	7	3	1	1	3	2	1	0	2	1	1	1	1	1	1	1	2	1	0	1	1	1	0	1	2	0	
	Door platform near CM6 W wall fan @ 3.5m	191	5	2	1	0	3	2	2	1	2	2	3	2	3	0	2	1	1	0	1	1	1	0	1	1	1	0	

Table 3.6A CM7 CM6 Frequency Tonality p.3

Table 3_2

Table 4.7: Boral Cement Berrima Annual noise 2019 - One-third Octave band spectra for Attended monitoring at residences and north fence

Condition	Description	Measure	Type	A-weighted sound level dBA in One-third Octave Band Frequency - Hz																														
		DateTime		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	
Day Time	30 Adelaide St.	10/9/19 10:06	Leq	21	20	21	24	29	32	36	37	41	37	36	35	34	36	37	37	37	36	34	32	30	28	27	24	21	18	14	9	5	0	
Day Time	30 Adelaide St.	10/9/19 10:06	L90	17	15	16	19	23	26	32	34	36	32	32	33	32	33	35	35	35	33	30	25	22	19	18	15	12	10	8	5	3	-1	
Day Time	30 Adelaide St.	2/10/19 16:45	Leq	20	15	17	21	25	27	30	31	35	31	28	30	31	32	34	34	33	32	32	31	34	31	29	26	23	21	17	12	6	0	
Day Time	30 Adelaide St.	2/10/19 16:45	L90	17	10	13	16	20	22	25	26	29	26	24	27	28	29	31	31	30	28	25	22	21	19	17	15	12	10	8	5	3	-1	
Day Time	12 Brisbane St.	2/10/19 16:23	Leq	18	17	21	25	31	29	34	40	38	38	35	36	39	38	40	42	42	41	38	36	34	33	31	27	24	22	20	13	10	4	
Day Time	12 Brisbane St.	2/10/19 16:23	L90	13	9	14	17	22	23	26	28	32	30	27	29	30	31	31	32	31	29	26	22	19	16	13	11	9	8	7	5	2	-1	
Day Time	4 Melbourne St.	10/9/19 12:17	Leq	20	22	23	29	34	36	39	43	44	42	43	46	47	48	48	49	49	48	47	45	44	42	40	38	35	30	26	20	58	69	
Day Time	4 Melbourne St.	10/9/19 12:17	L90	20	20	20	21	24	27	31	35	37	32	35	40	39	39	40	40	39	38	35	31	26	21	20	20	20	20	20	20	20	50	64
Day Time	4 Melbourne St.	2/10/19 16:50	Leq	18	18	21	26	33	35	36	41	42	40	39	40	43	43	44	46	48	47	44	43	42	40	37	34	30	25	21	15	56	67	
Day Time	4 Melbourne St.	2/10/19 16:50	L90	20	20	20	20	25	27	31	31	35	32	29	33	35	35	36	35	35	33	31	27	24	21	20	20	20	20	20	20	46	63	
Day Time	72 Taylor Ave ~ Outside house	10/9/19 12:55	Leq	27	26	31	39	48	50	47	55	54	54	52	55	55	54	57	57	57	56	55	53	52	50	48	47	47	49	42	38	67	79	
Day Time	72 Taylor Ave ~ Outside house	10/9/19 12:55	L90	24	20	23	24	26	28	32	36	38	35	35	38	36	36	38	38	38	36	33	29	24	20	20	20	20	20	20	20	49	69	
Day Time	72 Taylor Ave ~ Outside house	2/10/19 17:28	Leq	25	20	30	35	35	37	39	43	46	46	46	47	50	51	53	55	56	54	52	50	48	46	43	42	40	38	36	34	63	72	
Day Time	72 Taylor Ave ~ Outside house	2/10/19 17:28	L90	30	30	30	30	30	30	30	33	36	34	31	32	34	34	34	35	35	34	32	30	30	30	30	30	30	30	30	30	47	65	
Day Time	North Fence	10/9/19 10:34	Leq	21	24	28	31	36	35	38	36	37	35	37	42	47	49	47	46	46	42	42	38	36	34	31	27	26	31	24	15	55	69	
Day Time	North Fence	10/9/19 10:34	L90	17	20	22	25	25	28	31	31	33	31	34	39	42	44	44	43	42	39	37	34	29	25	19	15	12	10	10	10	52	66	
Day Time	North Fence	2/10/19 16:03	Leq	22	23	27	31	33	36	36	35	35	35	34	39	43	43	42	42	42	39	37	35	33	31	29	29	27	24	21	15	51	68	
Day Time	North Fence	2/10/19 16:03	L90	20	20	21	25	27	29	32	30	30	30	30	30	35	38	39	40	39	39	37	34	31	27	22	20	20	20	20	20	49	66	
Day Time	North Fence	15/10/19 13:59	Leq	25	22	25	29	31	33	35	32	36	38	31	35	39	41	40	39	40	38	38	36	35	34	33	31	29	27	24	19	50	69	
Day Time	North Fence	15/10/19 13:59	L90	22	20	21	23	25	26	27	26	30	32	27	31	34	36	36	36	36	36	35	34	31	28	24	21	20	20	20	20	47	67	
Day Time	North Fence	15/10/19 14:22	Leq	25	21	24	28	32	30	31	32	35	38	31	33	38	40	39	39	39	38	37	36	35	36	34	32	31	29	24	20	50	68	
Day Time	North Fence	15/10/19 14:22	L90	21	20	20	21	23	25	26	25	29	30	27	30	34	35	35	36	36	35	33	31	28	26	24	21	20	20	20	20	46	66	
Day Time	North Fence	1/11/19 13:30	Leq	25	21	26	29	32	36	32	33	35	38	34	37	39	43	42	40	40	39	38	36	34	33	30	29	28	25	24	19	51	69	
Day Time	North Fence	1/11/19 13:30	L90	22	20	22	23	24	26	27	26	30	32	29	32	34	37	36	36	35	34	31	27	23	20	20	20	20	20	20	20	46	67	
Day Time	North Fence	6/11/19 15:11	Leq	24	22	25	26	28	30	31	31	36	39	33	36	39	41	41	41	41	39	38	36	34	34	33	32	29	26	23	19	50	68	
Day Time	North Fence	6/11/19 15:11	L90	20	20	20	21	22	25	27	26	30	32	30	32	36	37	38	38	37	36	34	31	28	25	23	21	20	20	20	20	48	66	
Day Time	North Fence	19/11/19 12:31	Leq	23	24	27	27	30	31	33	32	36	39	35	38	41	43	43	42	42	41	39	38	36	35	34	32	30	29	31	24	52	68	
Day Time	North Fence	19/11/19 12:31	L90	20	20	22	22	23	25	27	28	31	33	32	35	37	39	39	39	38	37	34	31	28	25	23	21	20	24	26	20	49	66	
Day Time	Stock Yard	10/9/19 11:30	Leq	25	25	33	34	39	40	57	53	46	44	44	46	50	52	50	49	49	48	48	47	45	47	45	42	38	35	28	28	62	78	
Day Time	Stock Yard	10/9/19 11:30	L90	30	30	30	30	30	34	50	49	41	38	39	42	45	46	46	45	45	44	42	39	35	31	30	30	30	30	30	30	59	75	
Day Time	Stock Yard	10/9/19 11:48	Leq	25	24	28	31	34	35	39	40	45	39	40	43	49	50	49	47	46	45	43	40	36	34	28	25	22	20	19	18	57	71	
Day Time	Stock Yard	10/9/19 11:48	L90	30	30	30	30	31	32	36	37	42	36	37	41	44	45	45	45	45	44	43	41	38	33	30	30	30	30	30	30	55	69	
Day Time	Stock Yard	2/10/19 15:12	Leq	24	21	27	31	36	37	39	42	43	44	40	43	45	44	45	45	45	44	43	41	39	37	34	32	30	25	22	18	55	71	
Day Time	Stock Yard	2/10/19 15:12	L90	20	20	21	26	31	32	36	38	40	40	36	38	40	39	41	41	41	40	39	36	33	28	21	20	20	20	20	20	52	68	
Day Time	Stock Yard	2/10/19 15:33	Leq	25	21	27	32	37	40	40	45	45	41	40	43	46	45	45	45	45	44	43	42	42	40	37	34	30	26	22	19	56	71	
Day Time	Stock Yard	2/10/19 15:33	L90	22	20	22	27	32	33	37	39	39	37	35	39	41	39	41	42	42	41	39	36	33	28	21	20	20	20	20	20	52	69	
Day Time	Stock Yard	15/10/19 15:04	Leq	27	24	26	31	34	35	37	41	43	43	39	40	46	45	44	44	44	43	43	40	38	36	34	31	29	25	23	18	55	71	
Day Time	Stock Yard	15/10/19 15:04	L90	20	20	21	26	29	31	33	37	39	38	35	37	40	41	41	41	42	41	40	37	34	30	25	20	20	20	20	52	68		
Day Time	Stock Yard	1/11/19 14:03	Leq	28	22	29	32	36	38	39	41	44	45	41	43	47	48	47	46	46	47	44	43	41	39	37	34	29	24	21	18	57	73	
Day Time	Stock Yard	1/11/19 14:03	L90	26	20	24	27	30	32	35	37	39	40	38	39	42	43	43	42	42	41	39	36	33	27	20	20	20	20	20	53	71		
Day Time	Stock Yard	1/11/19 15:33	Leq	29	22	27	30	32	34	38	39	43	44	39	42	47	47	46	44	44	43	41	40	37	33	28	25	22	19	16	13	55	72	
Day Time	Stock Yard	1/11/19 15:33	L90	26	20	22	25	28	31	35	36	39	39	36	39	41	42	42	41	41	40	39	36	33	28	21	20	20	20	20	53	70		
Day Time	Stock Yard	6/11/19 16:24	Leq	32	33	36	38	41	41	45	54	44	45	45	45	47	47	46	46	45	44	43	40	38	35	32	30	28	25	23	24	59	79	
Day Time	Stock Yard	6/11/19 16:24	L90	25	20	23	27	31	32	36	38	39	38	37	39	40	42	42	42	42	41	40	36	32	27	22	20	20	20	20	53	72		
Day Time	Stock Yard	19/11/19 13:18	Leq	28	28	30	33	36	37	40	43	44	45	43	45	49	48	48	48	47	46	44	41	38	37	33	31	26	22	19	58	74		
Day Time	Stock Yard	19/11/19 13:18	L90	30	30	30	30	30	32	34	38	39	39	38	41	44	44	44	43	43	41	39	37	32	30	30	30	30	30	30	54	70		
Evening Time	12 Brisbane St.	2/10/19 21:28	Leq	18	16	15	20	23	25	27	28	38	34	28	29	32	33	34	36	33	32	30	29	27	27	25	23	20	18	16	11	45	62	
Evening Time	12 Brisbane St.	2/10/19 21:28	L90	15	12	11	16	20	22	24	25	36	31	24	26	29	30	31	32	29	27													

Figure A1A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 8 Top Platform

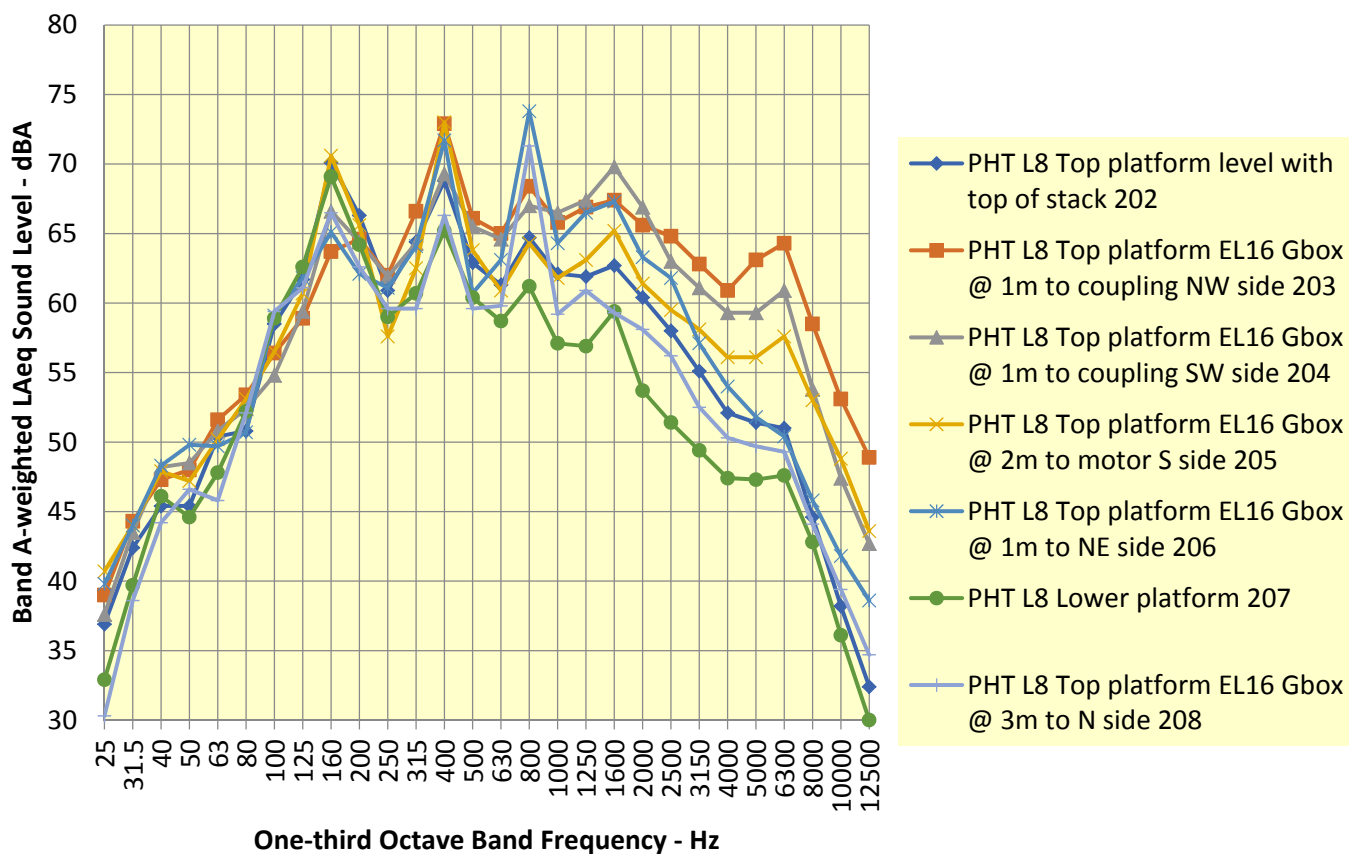


Figure A1B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 8 Top Platform

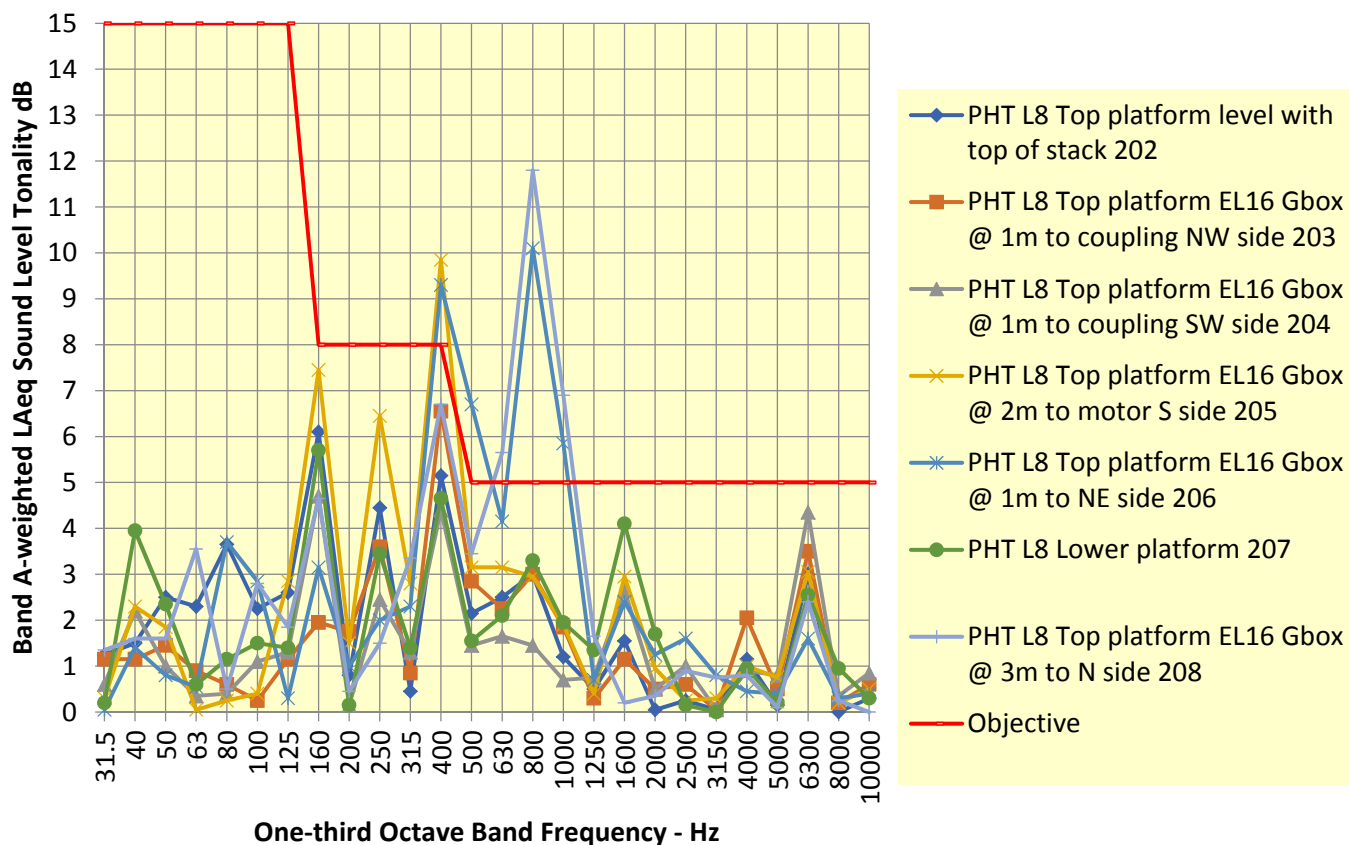


Figure A2A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 8

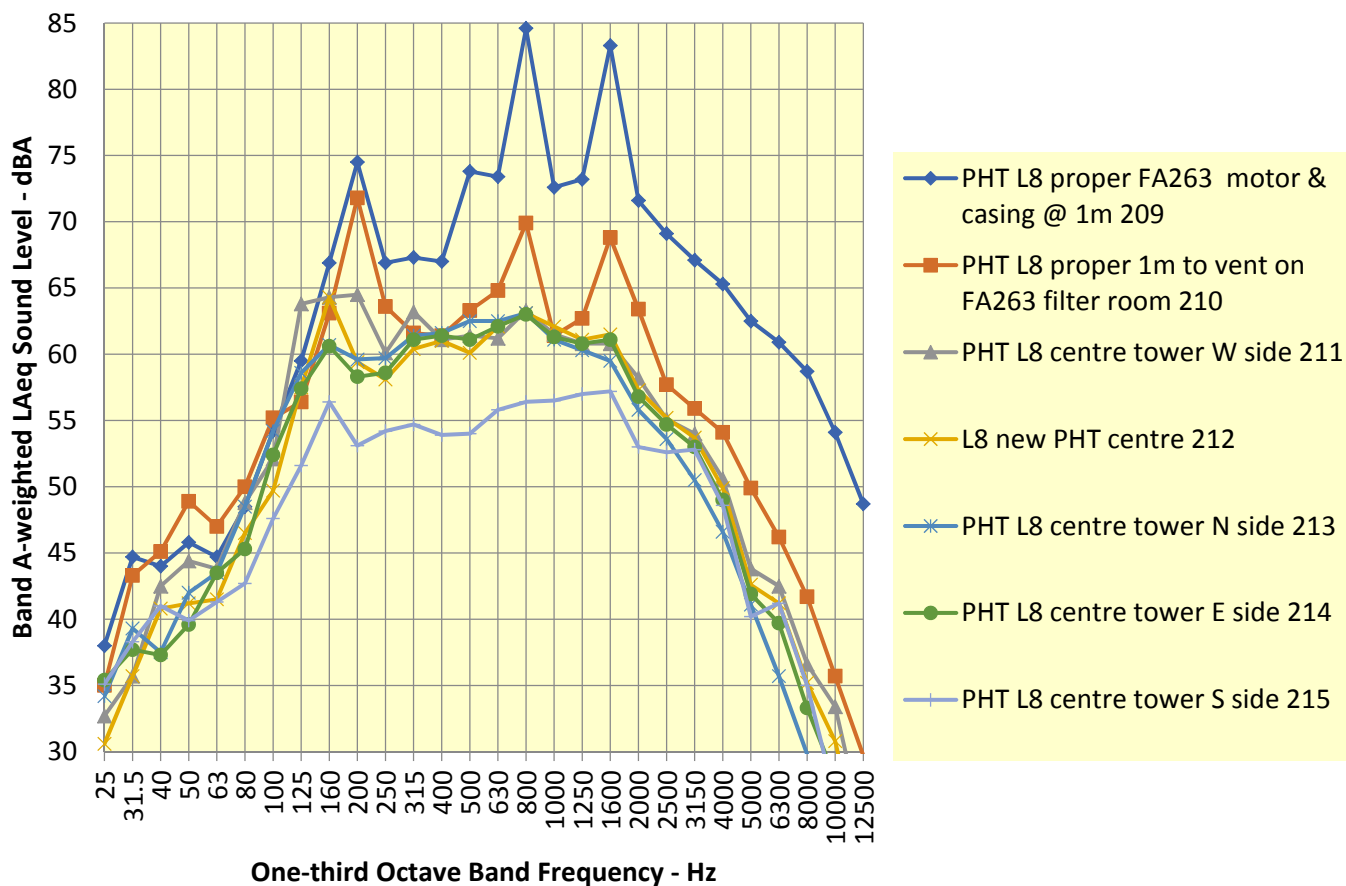


Figure A2B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 8

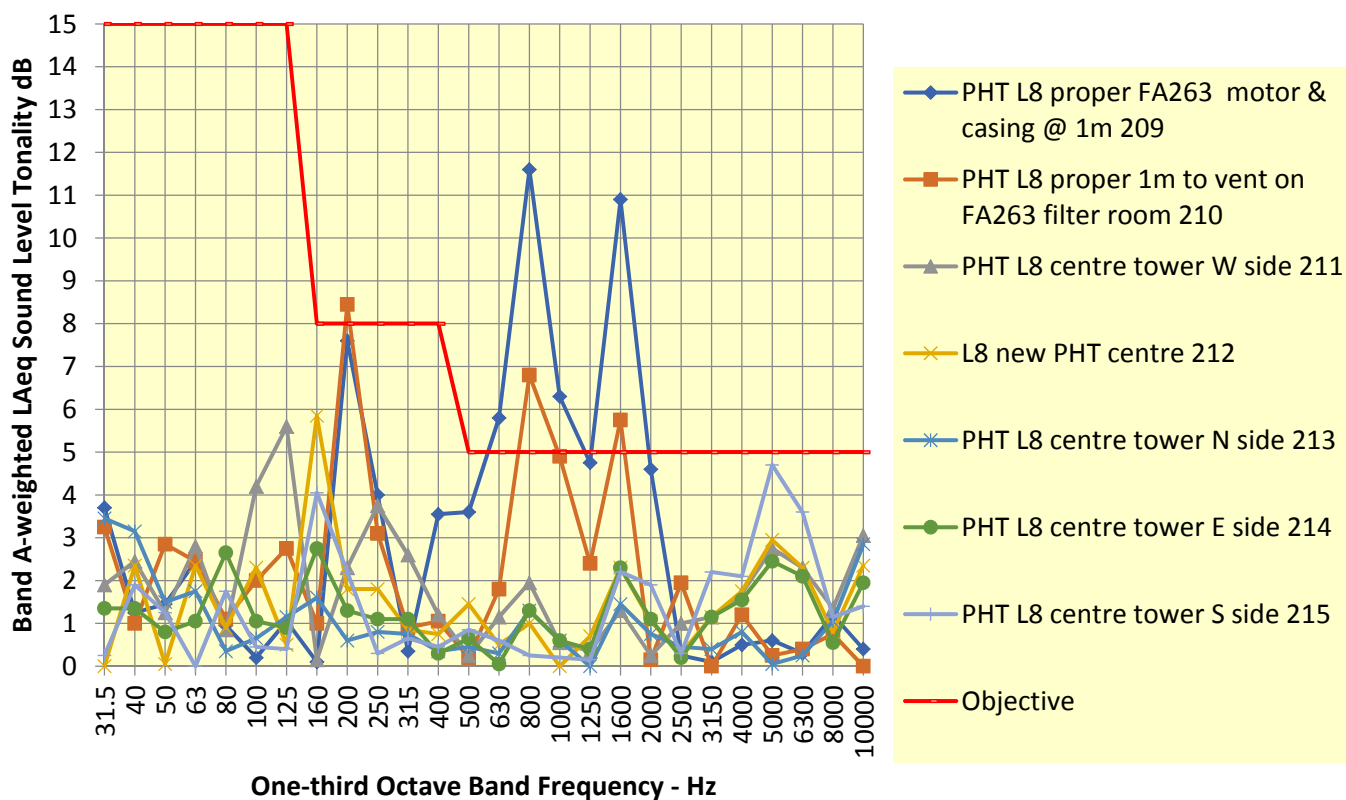


Figure A3A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 7 Alt. Fuels Platform

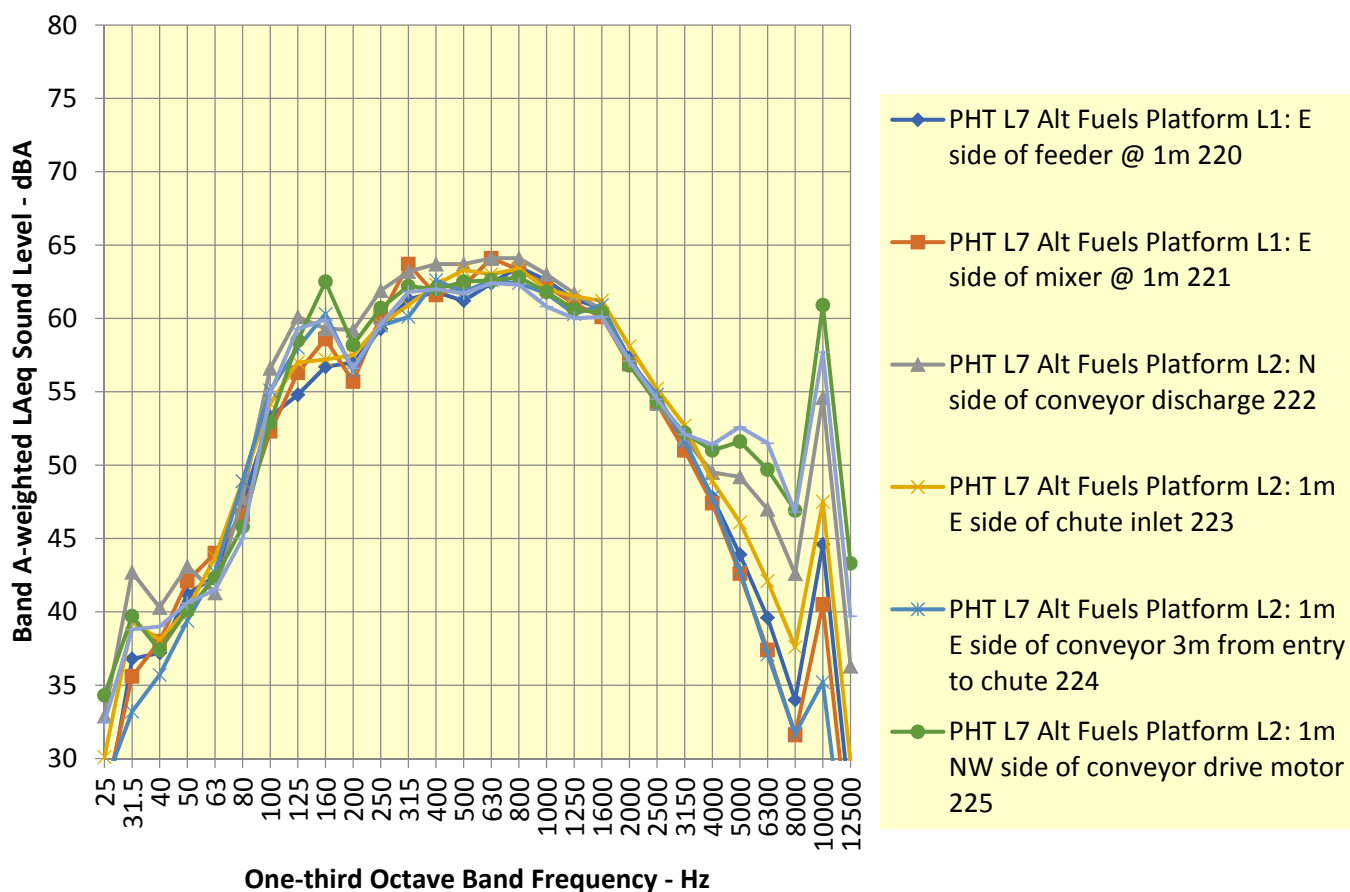


Figure A3B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 7 Alt. Fuels Platform

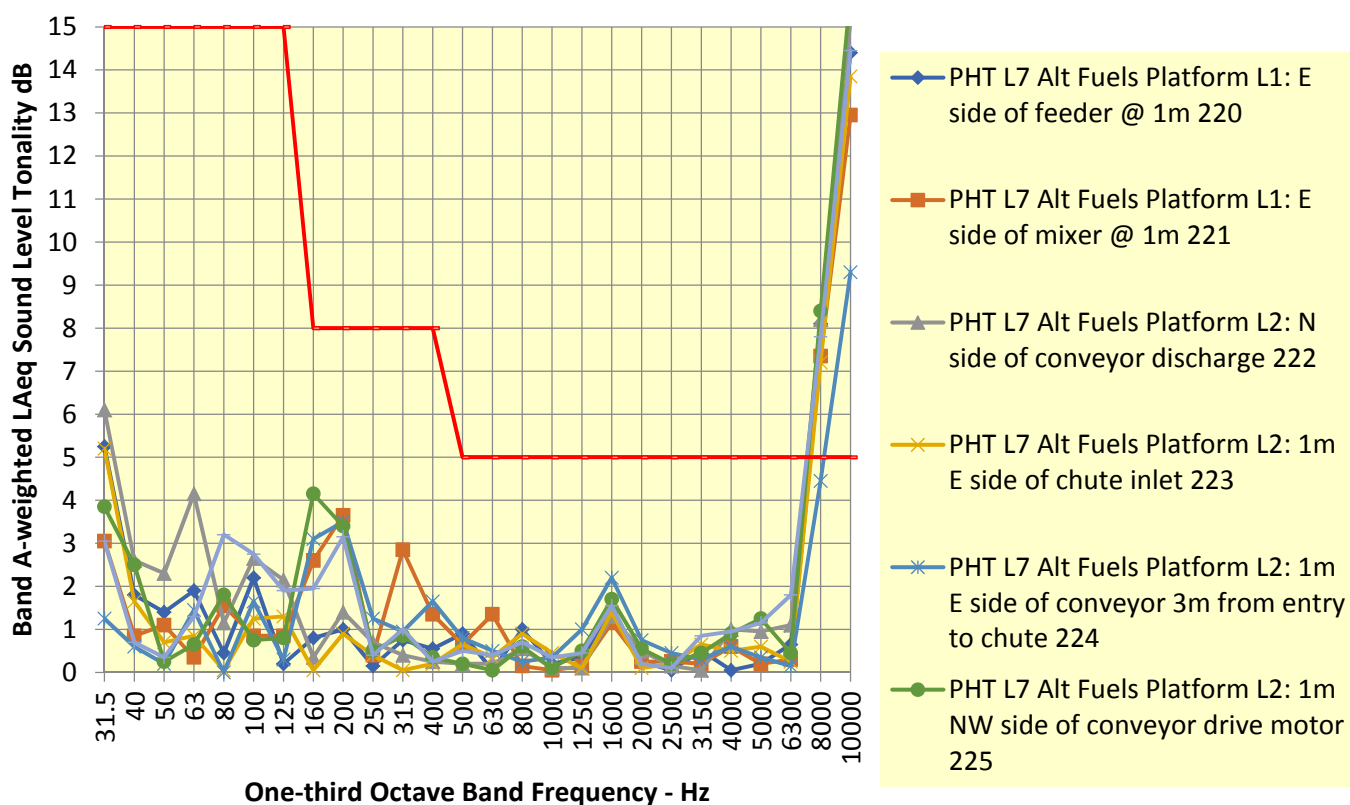


Figure A4A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 7

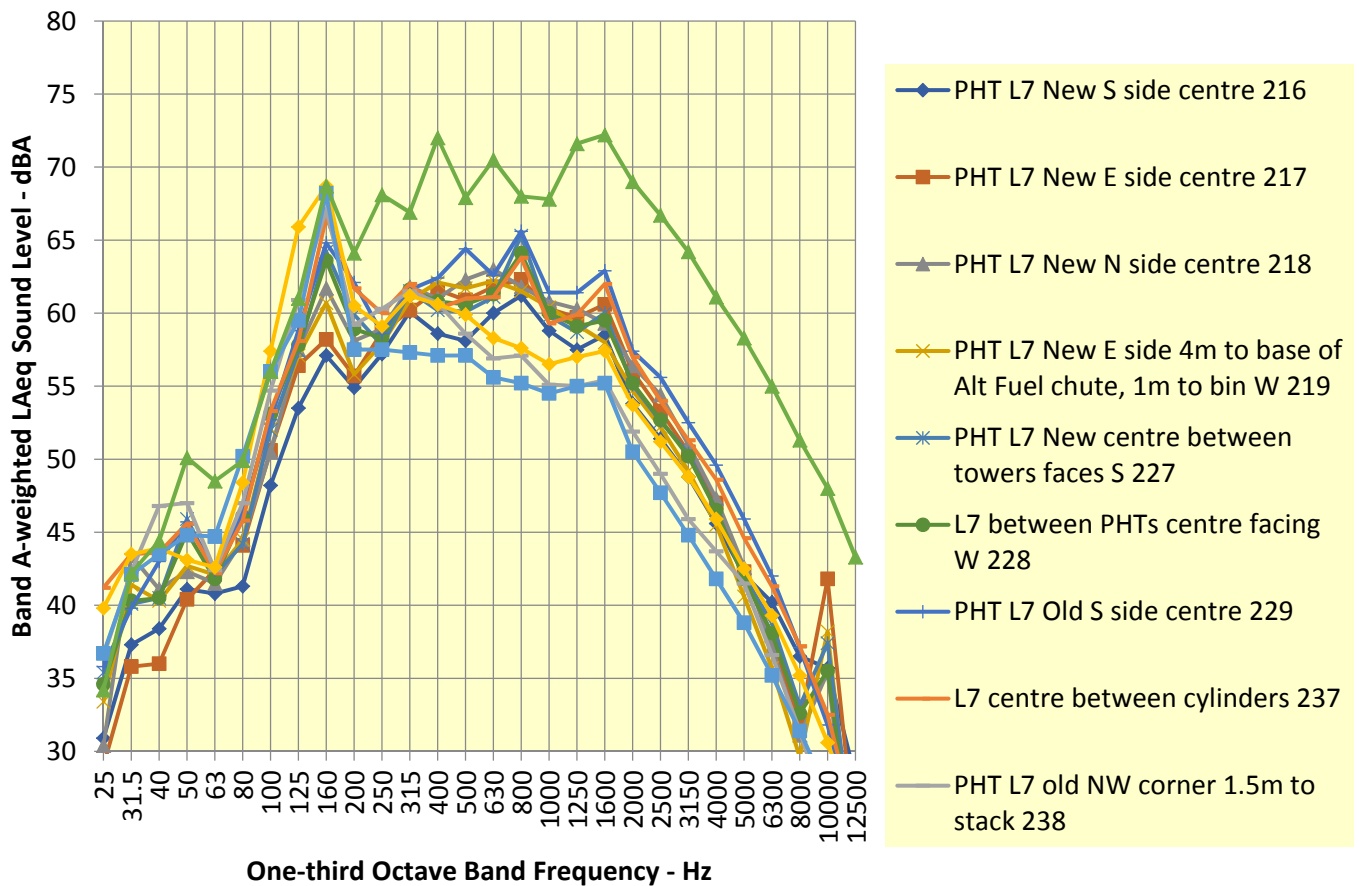


Figure A4B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 7

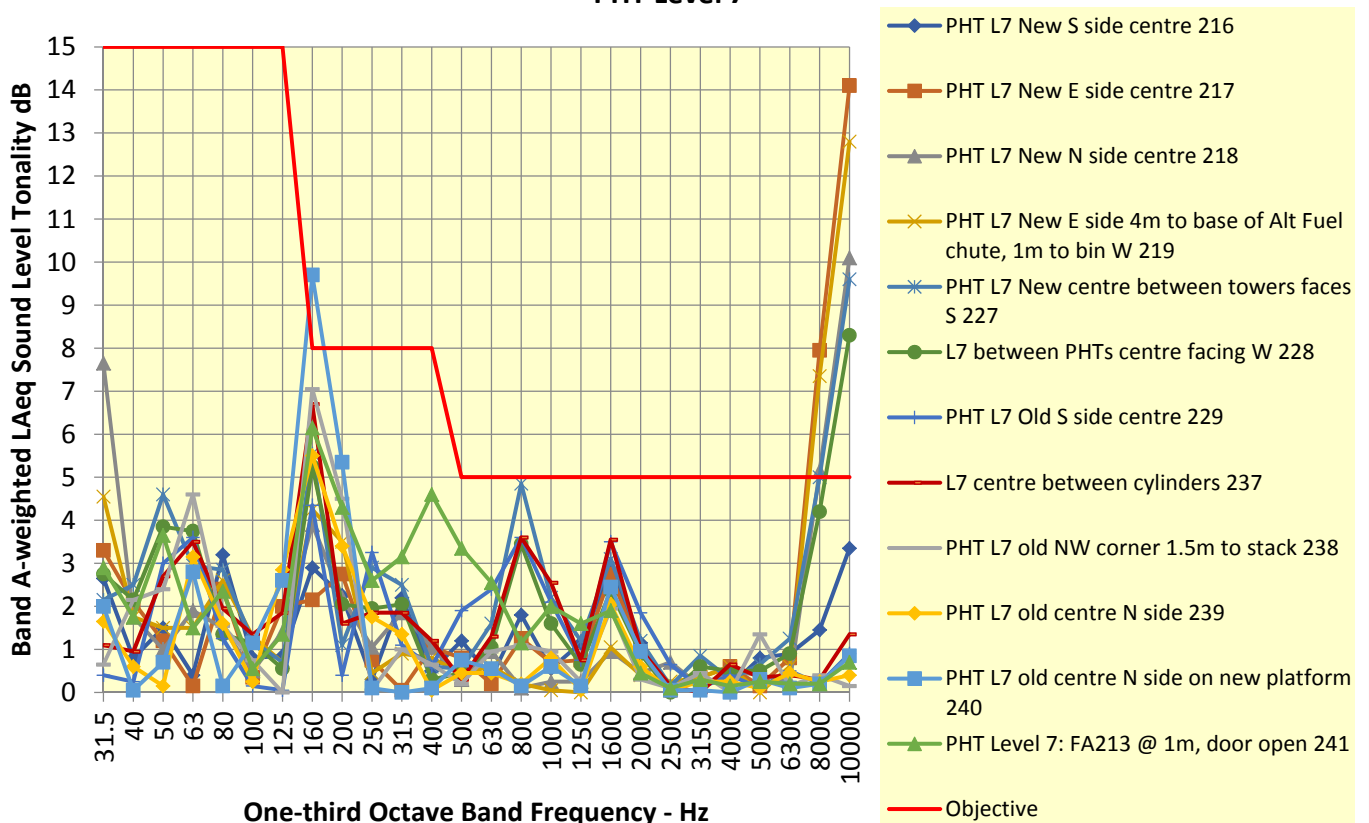


Figure A5A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 7 EL13 Platform

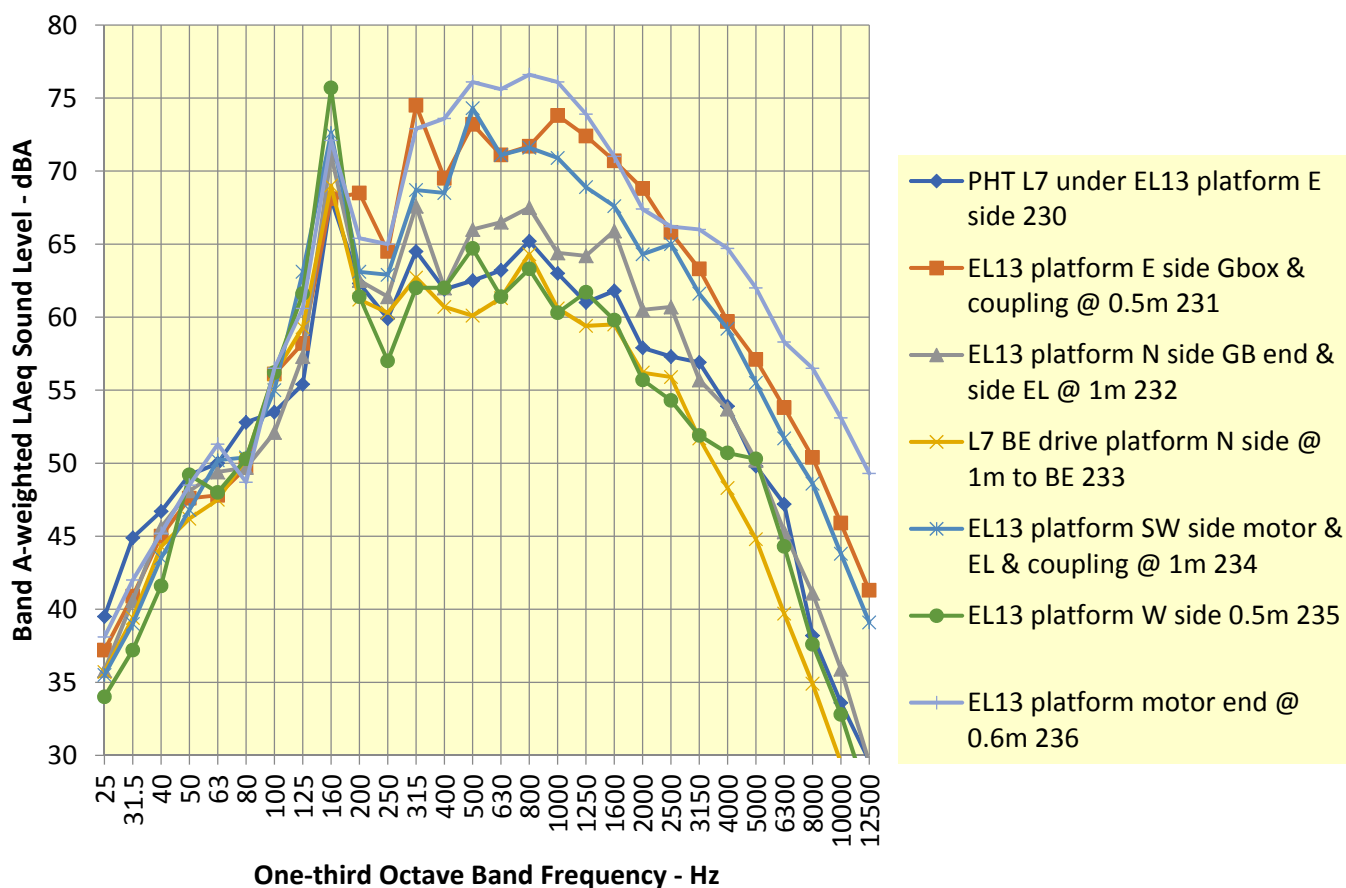


Figure A5B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 7 EL13 Platform

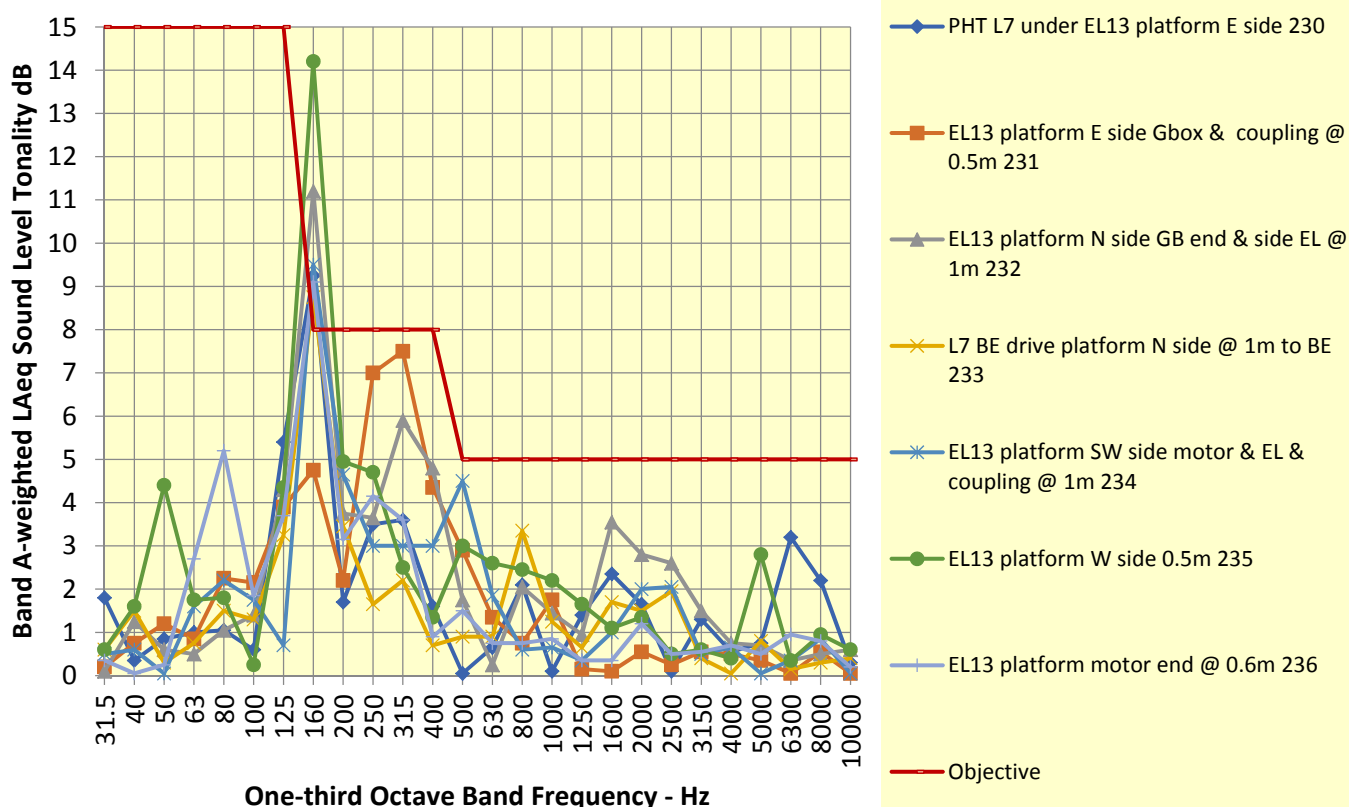


Figure A6A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 6 RM Silo Top

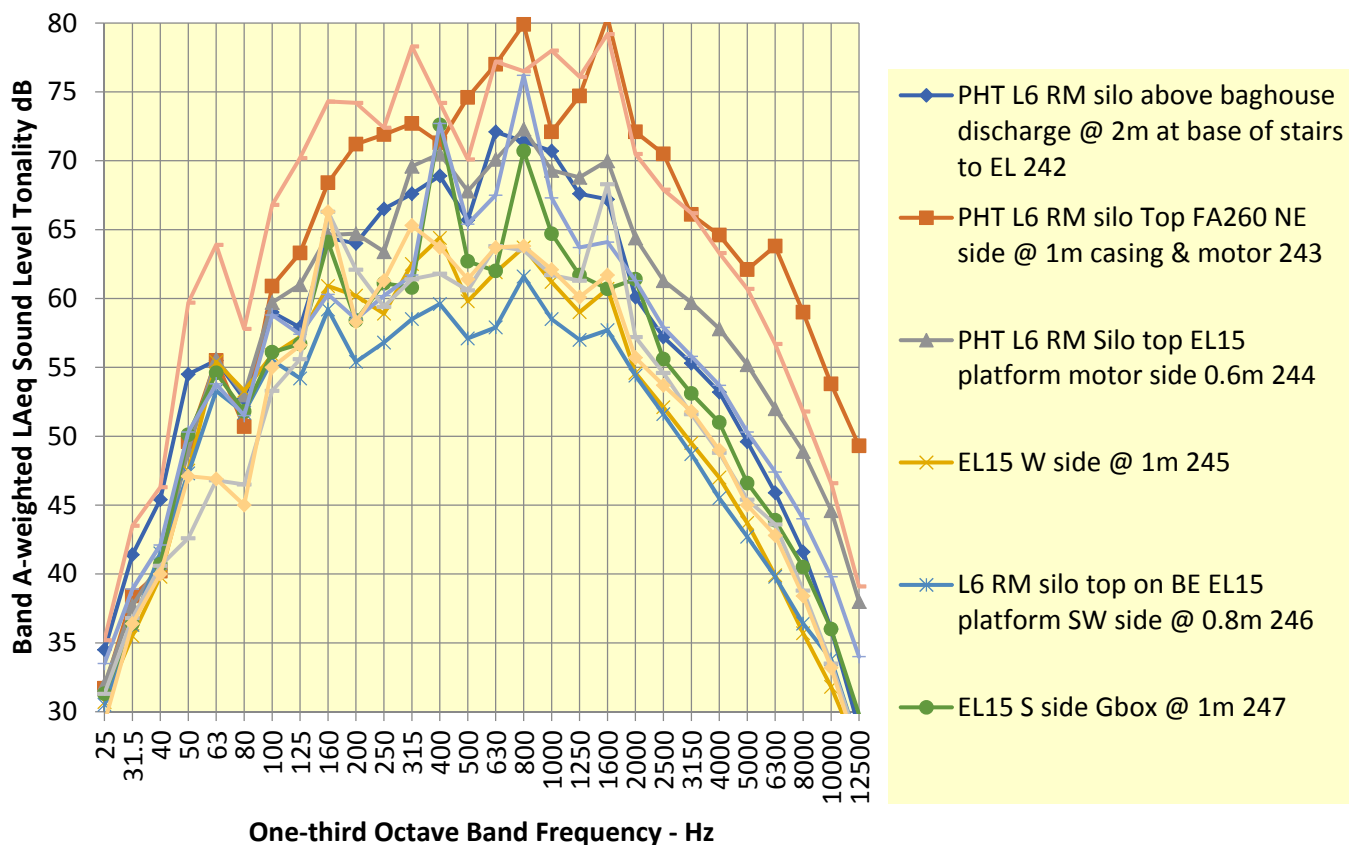


Figure A6B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 6 RM Silo Top

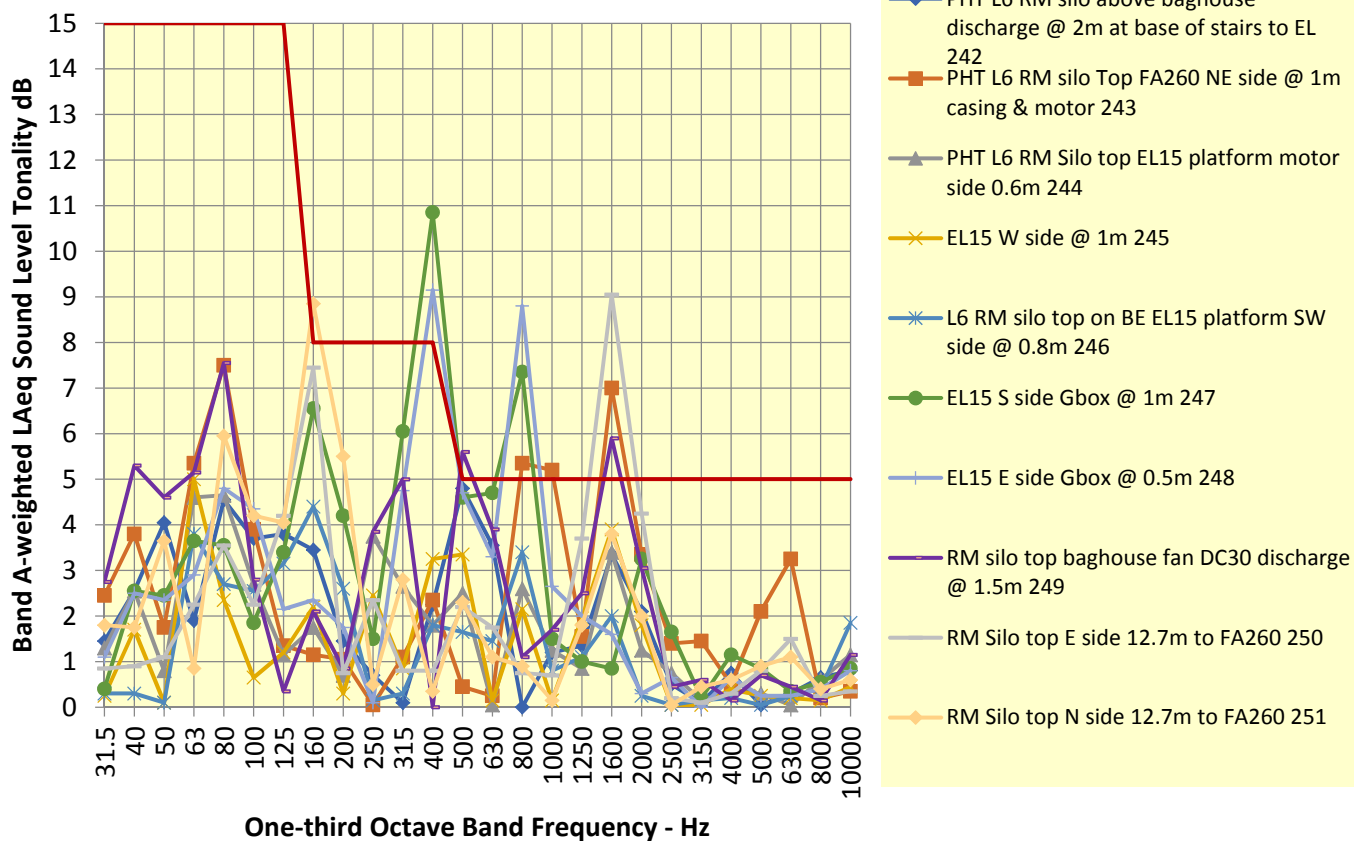


Figure A7A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 6

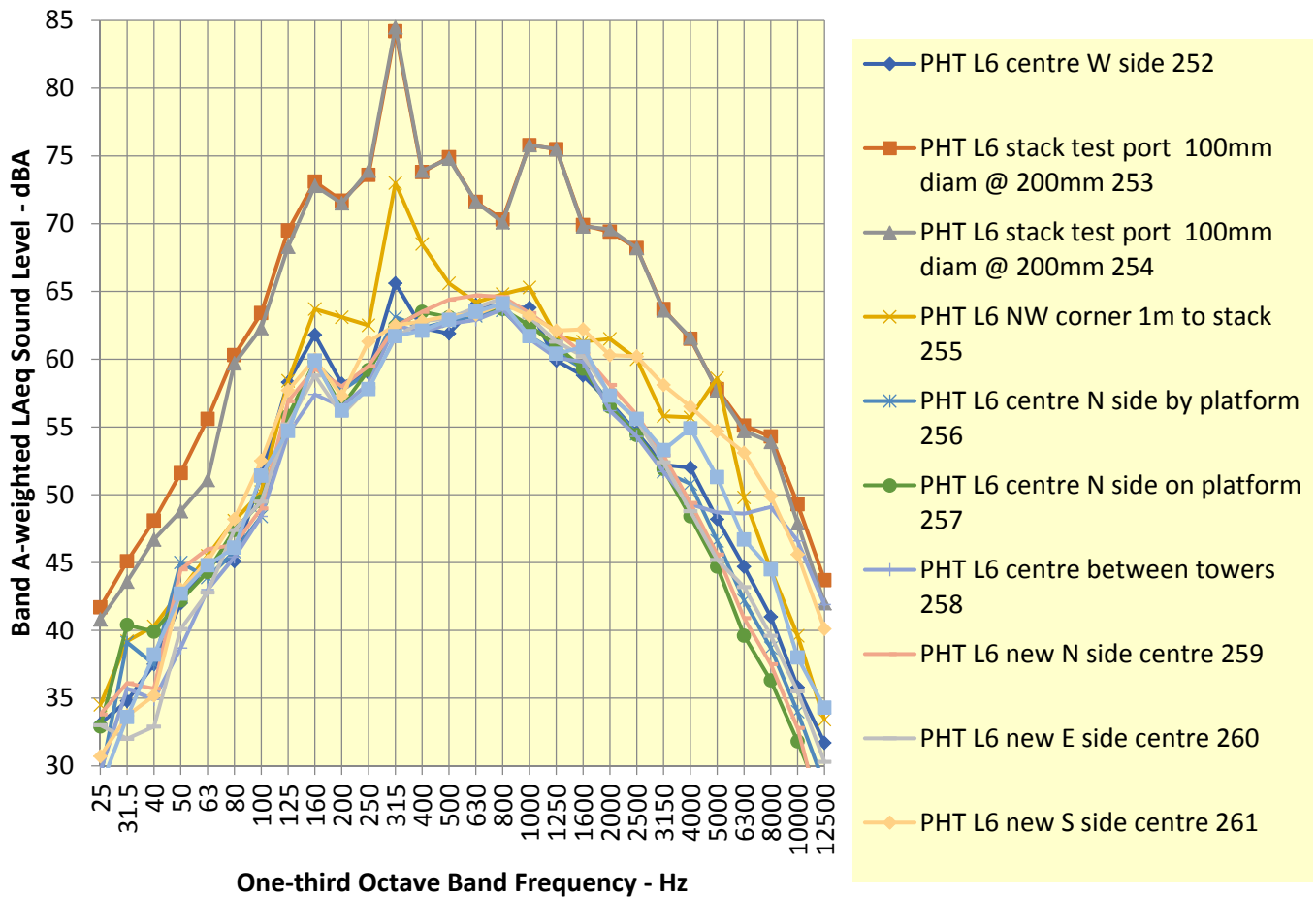


Figure A7B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 6

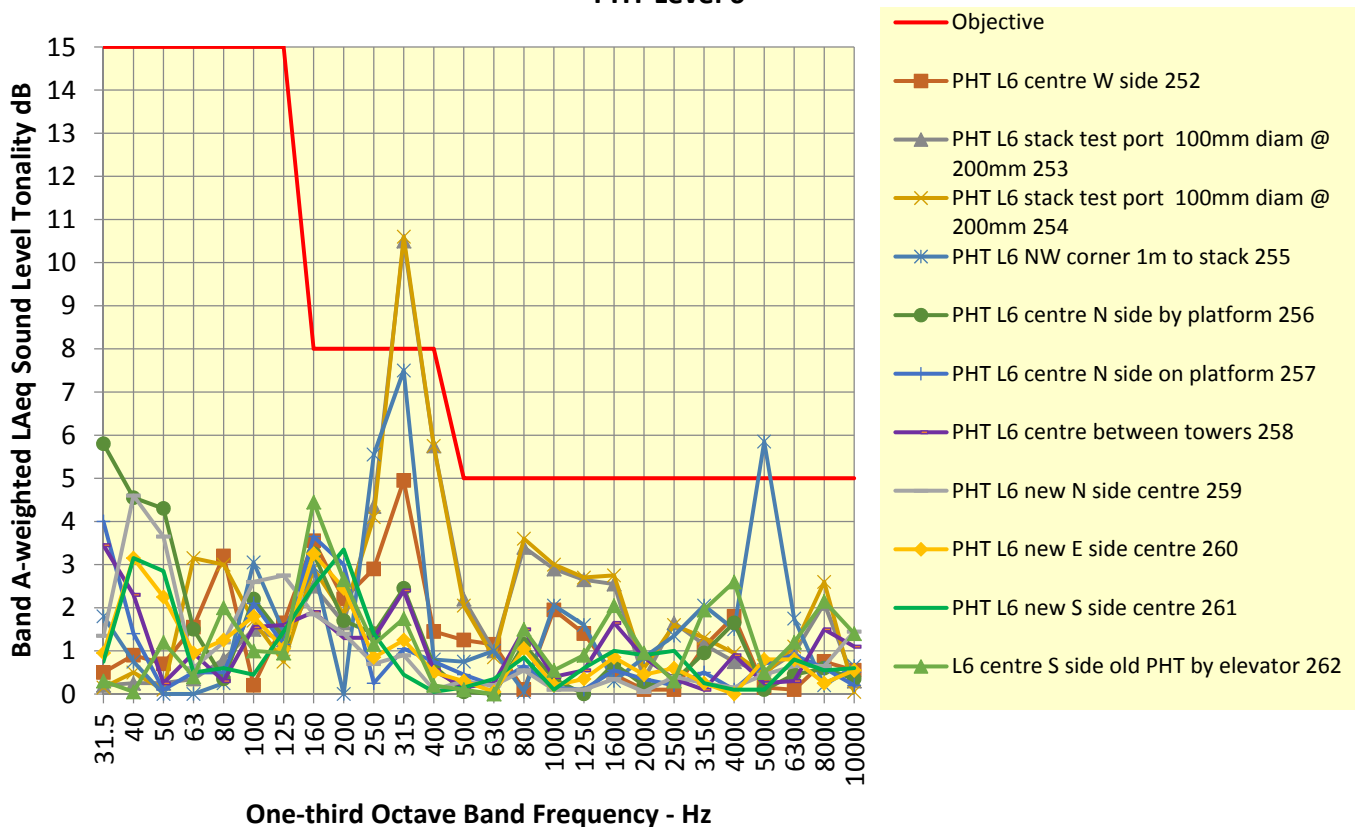


Figure A8A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 6 Inside RM Silo Top

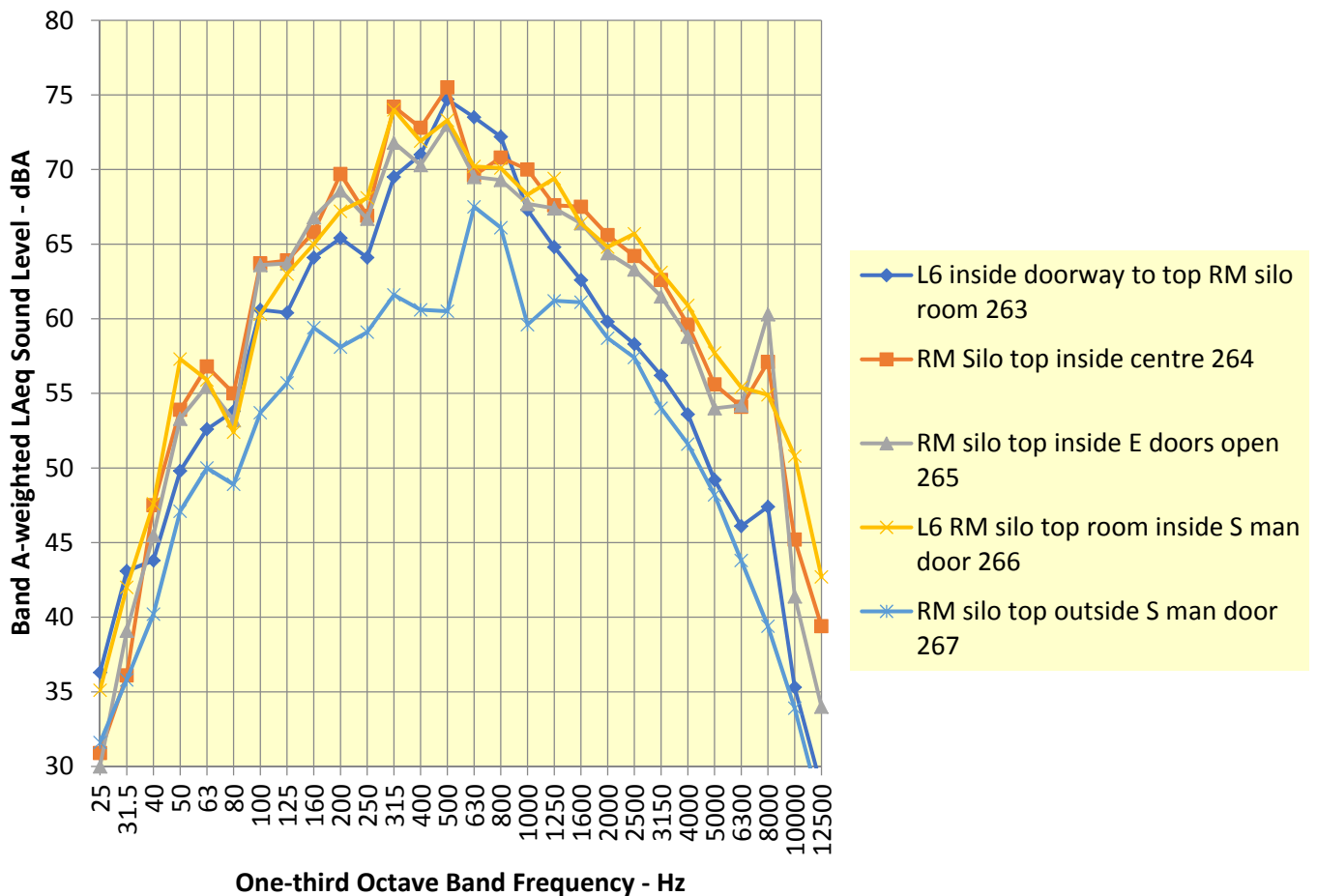


Figure A8B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 6 Inside RM Silo Top

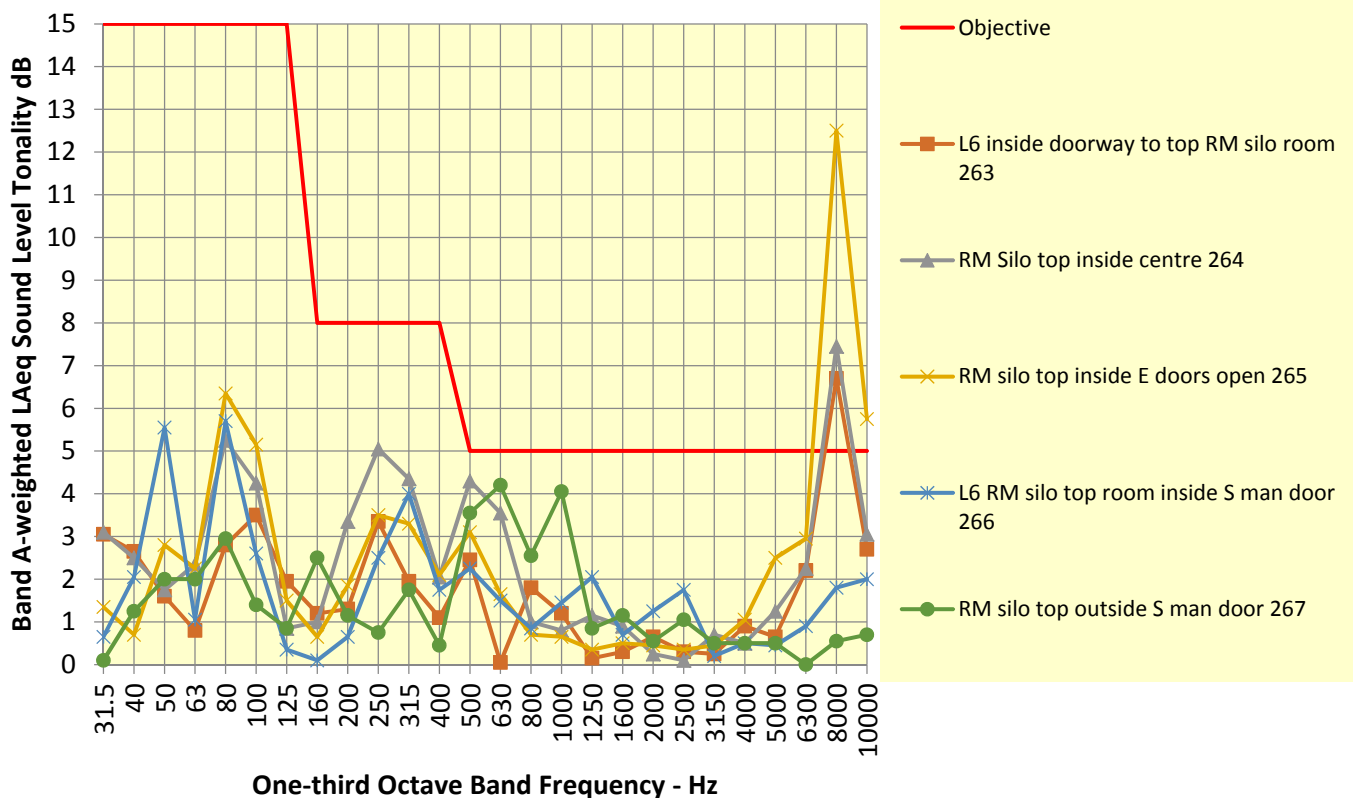


Figure A9A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 5

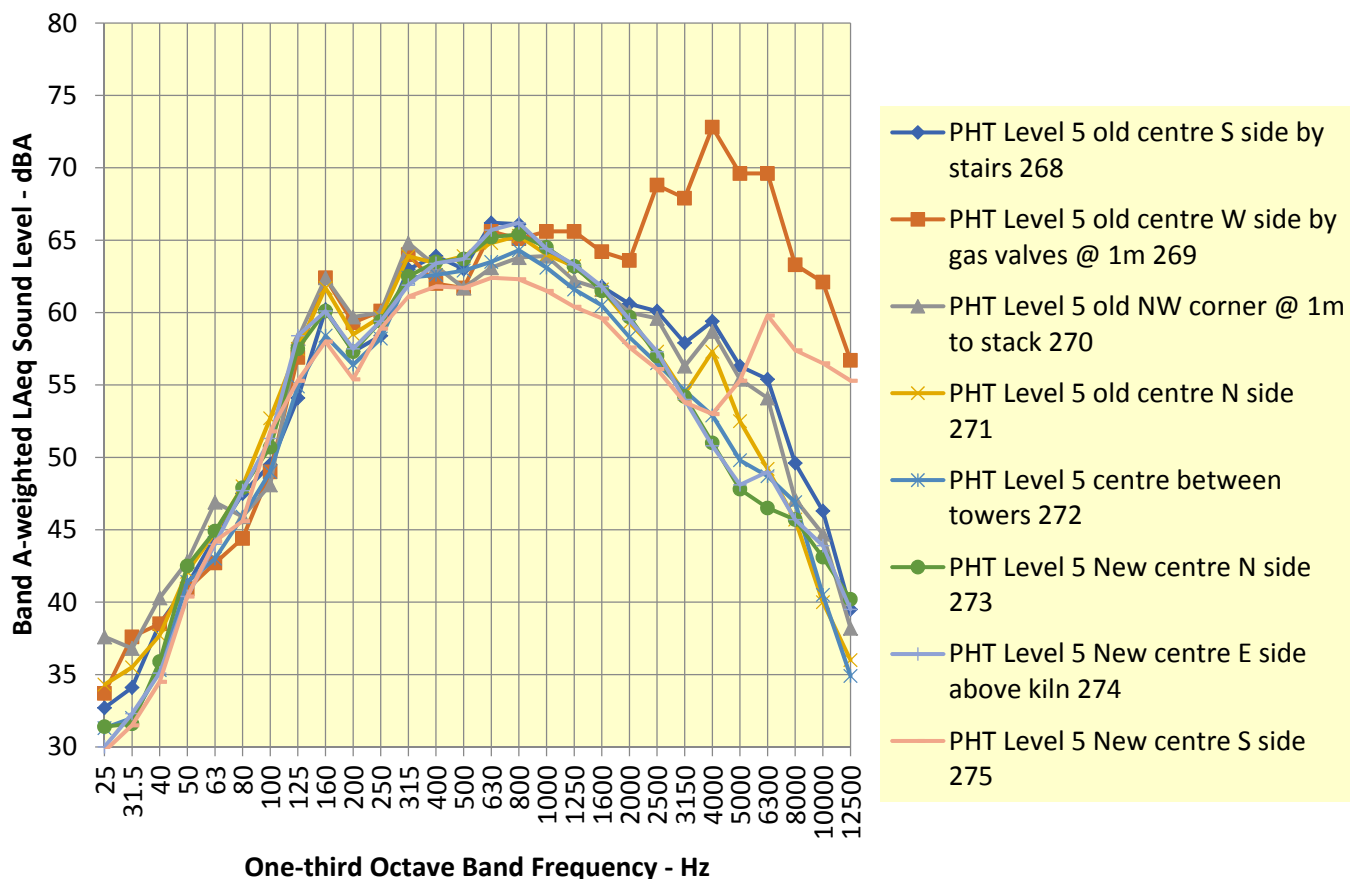


Figure A9B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 5

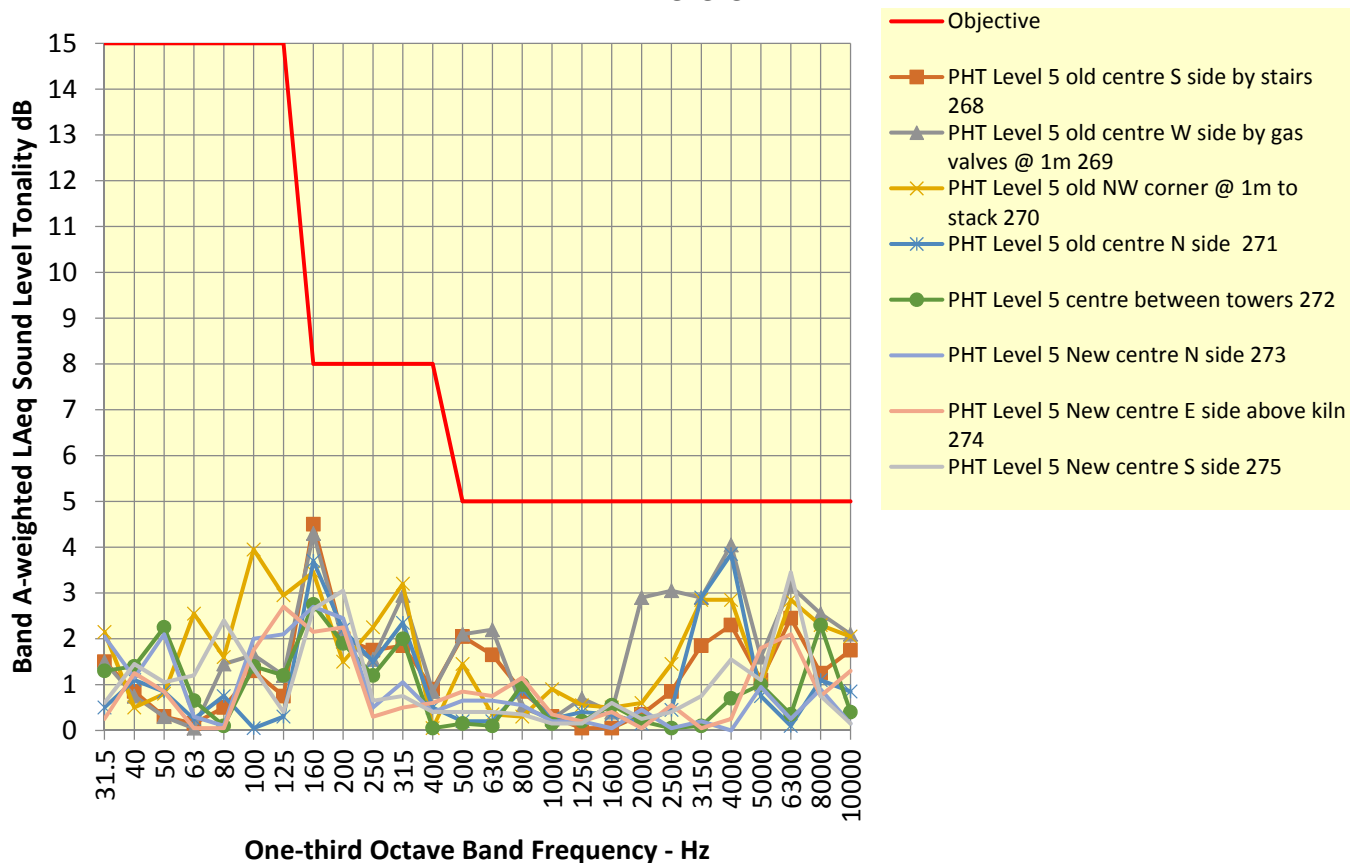


Figure A10A: Boral Cement Berrima Annual Noise 2019 Spectra

PHT Level 4

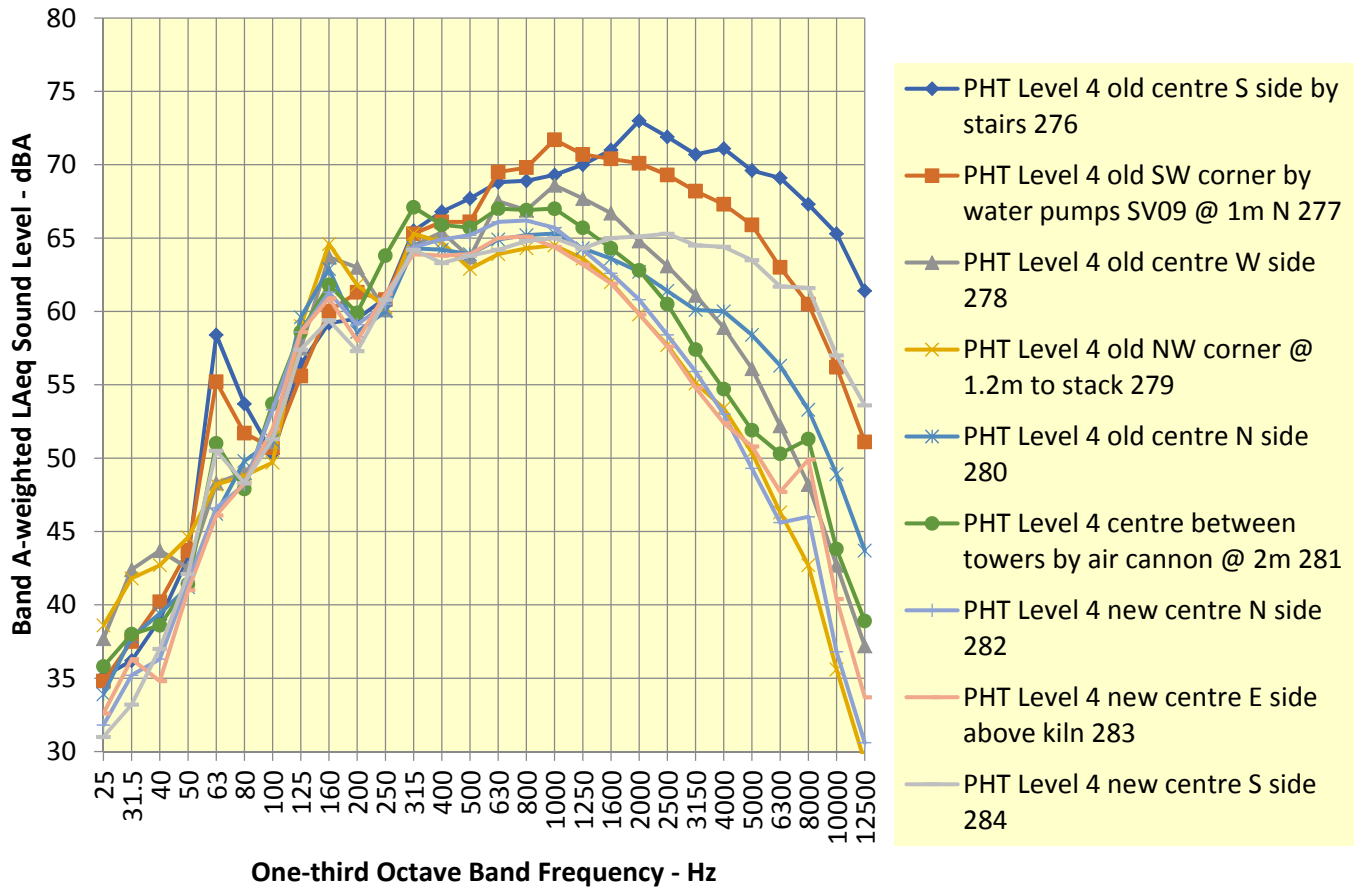


Figure A10B: Boral Cement Berrima Annual Noise 2019 Tonality

PHT Level 4

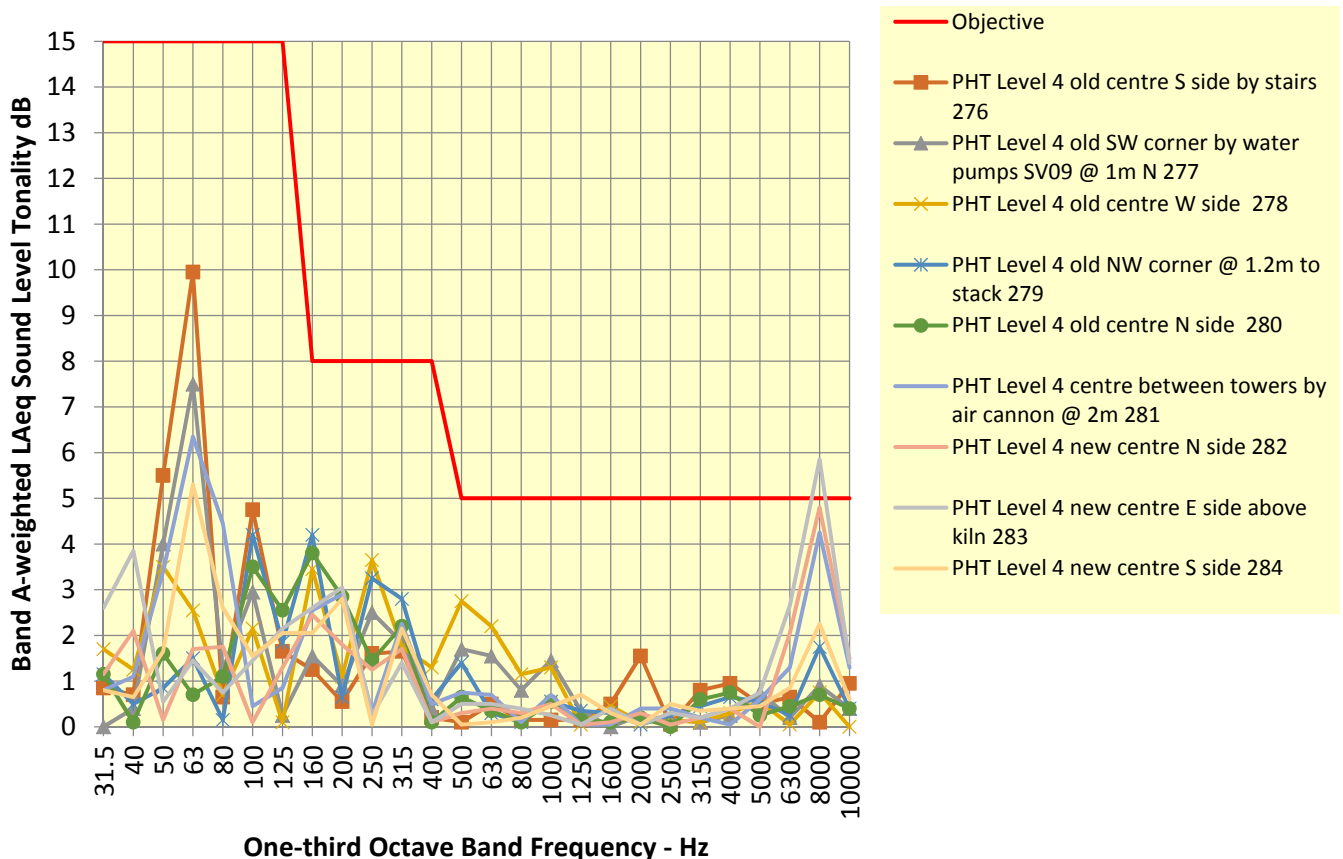


Figure A11A: Boral Cement Berrima Annual Noise 2019 Spectra
ESP opposite PHT Level 3

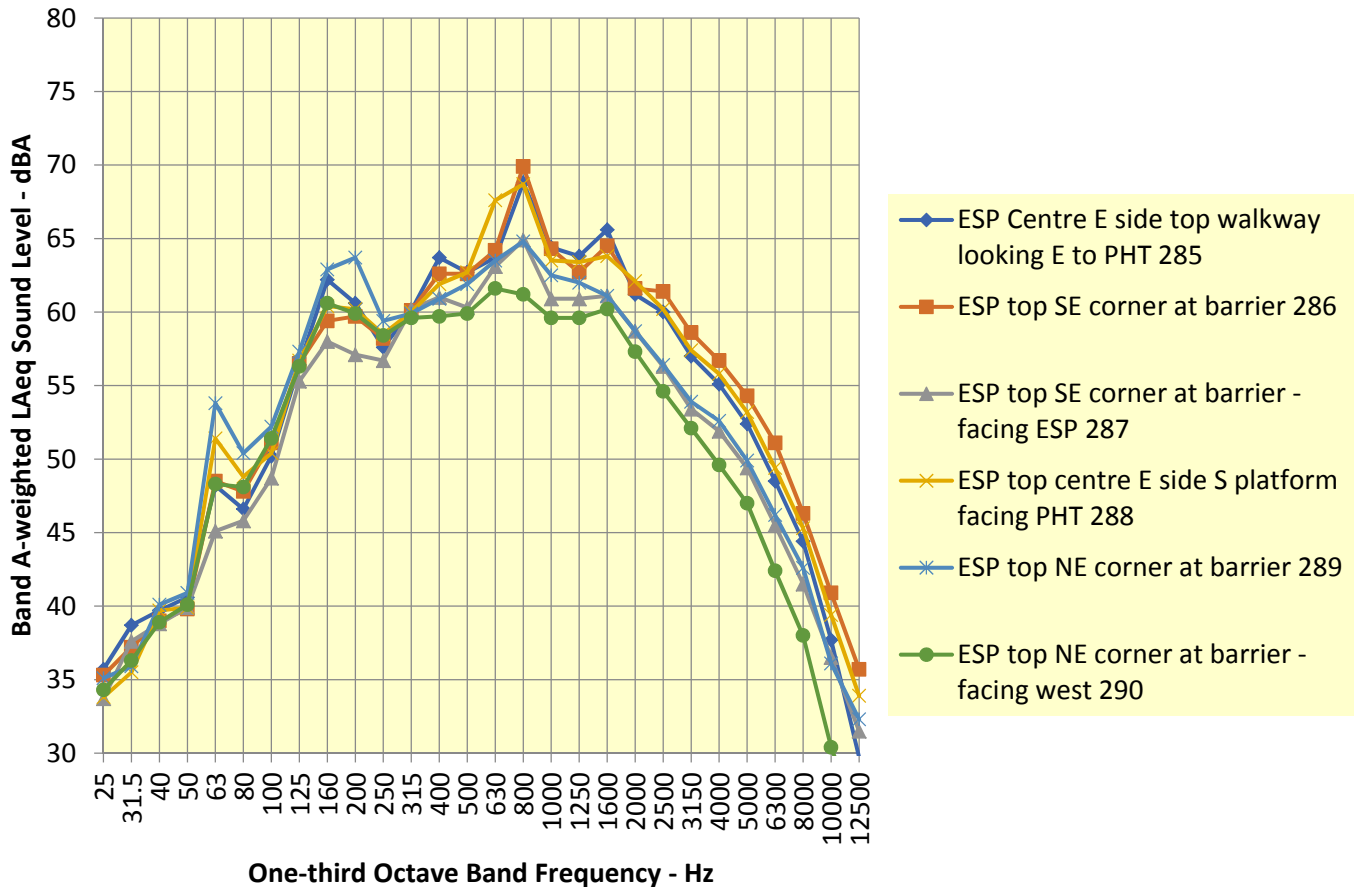


Figure A11B: Boral Cement Berrima Annual Noise 2019 Tonality
ESP opposite PHT Level 3

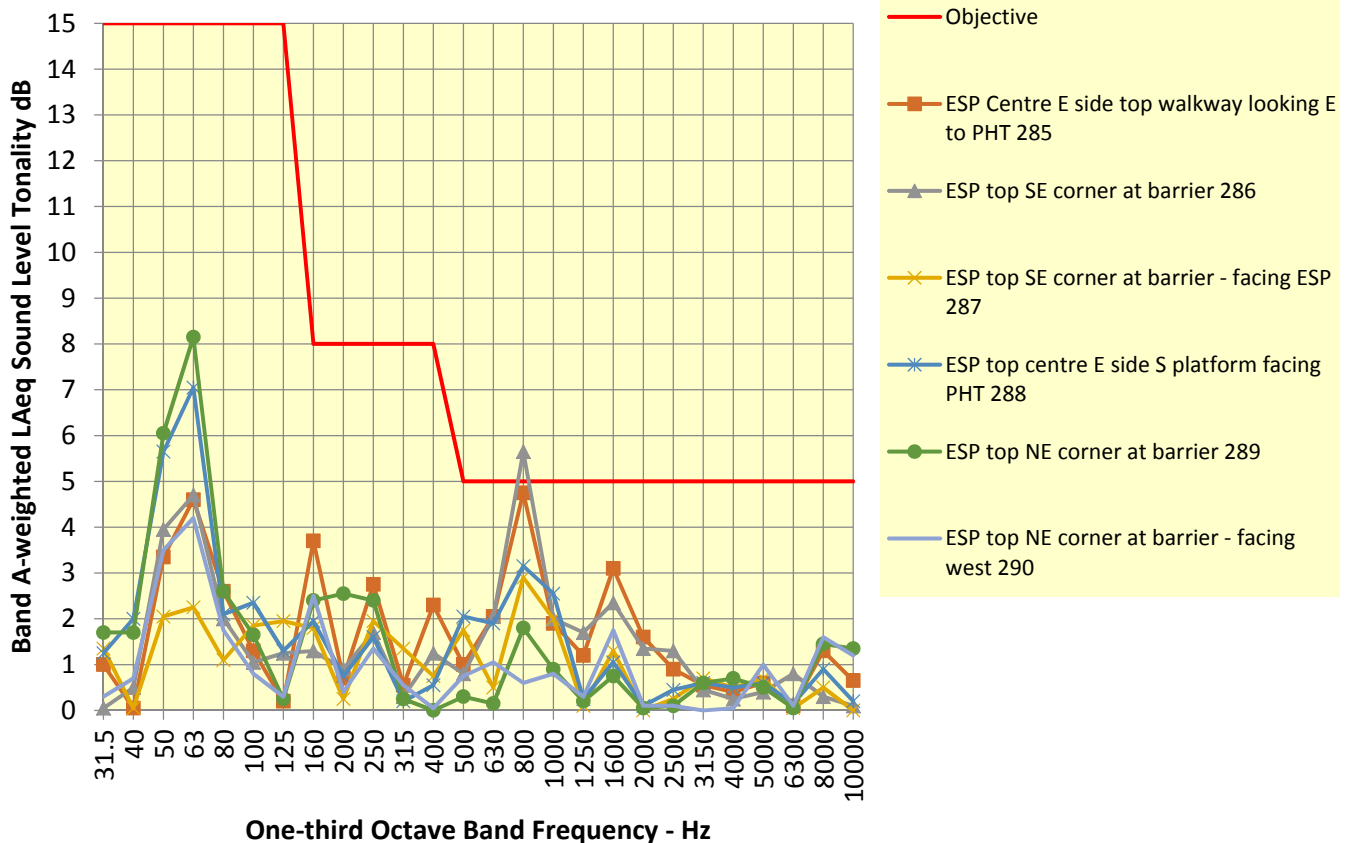


Figure A12A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 3

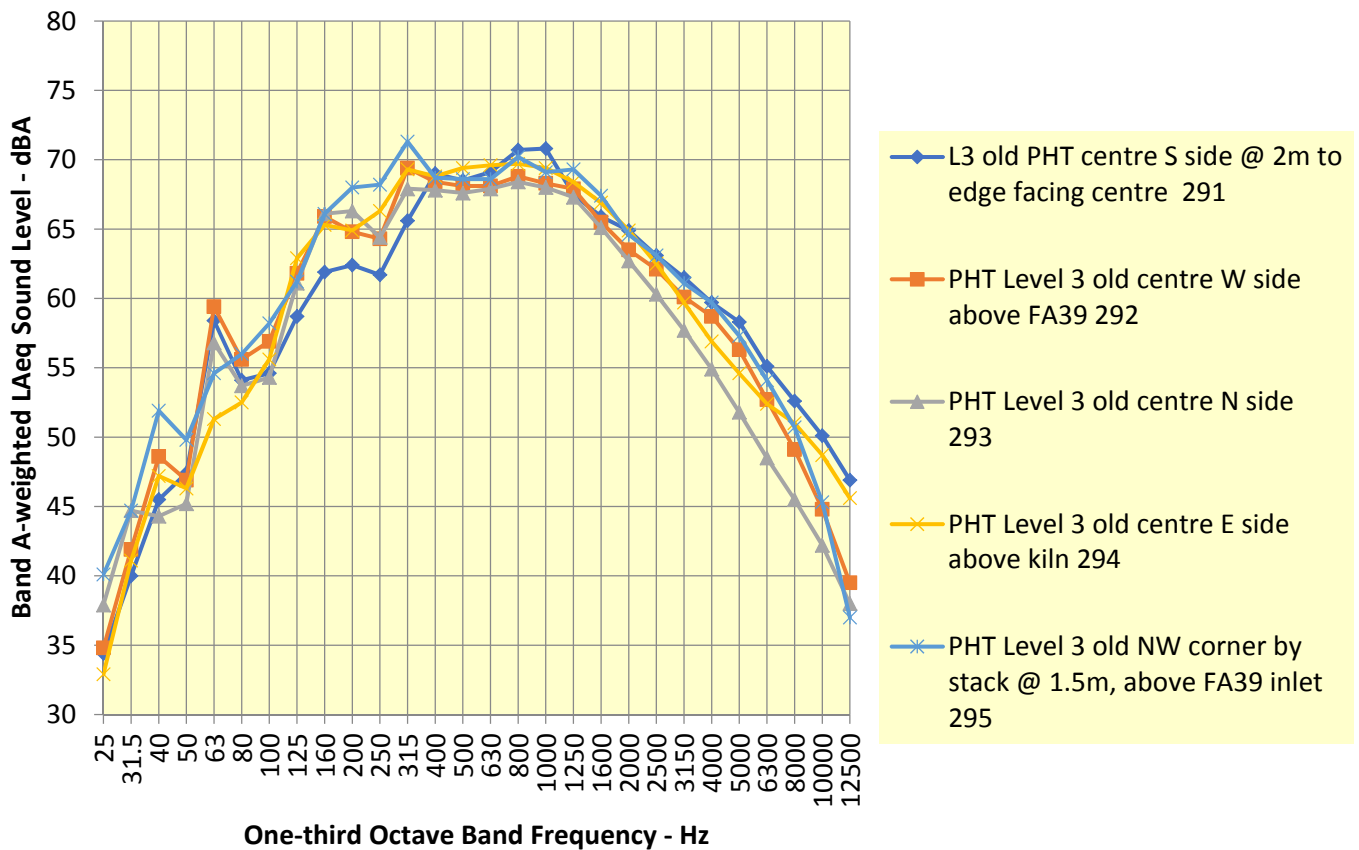


Figure A12B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 3

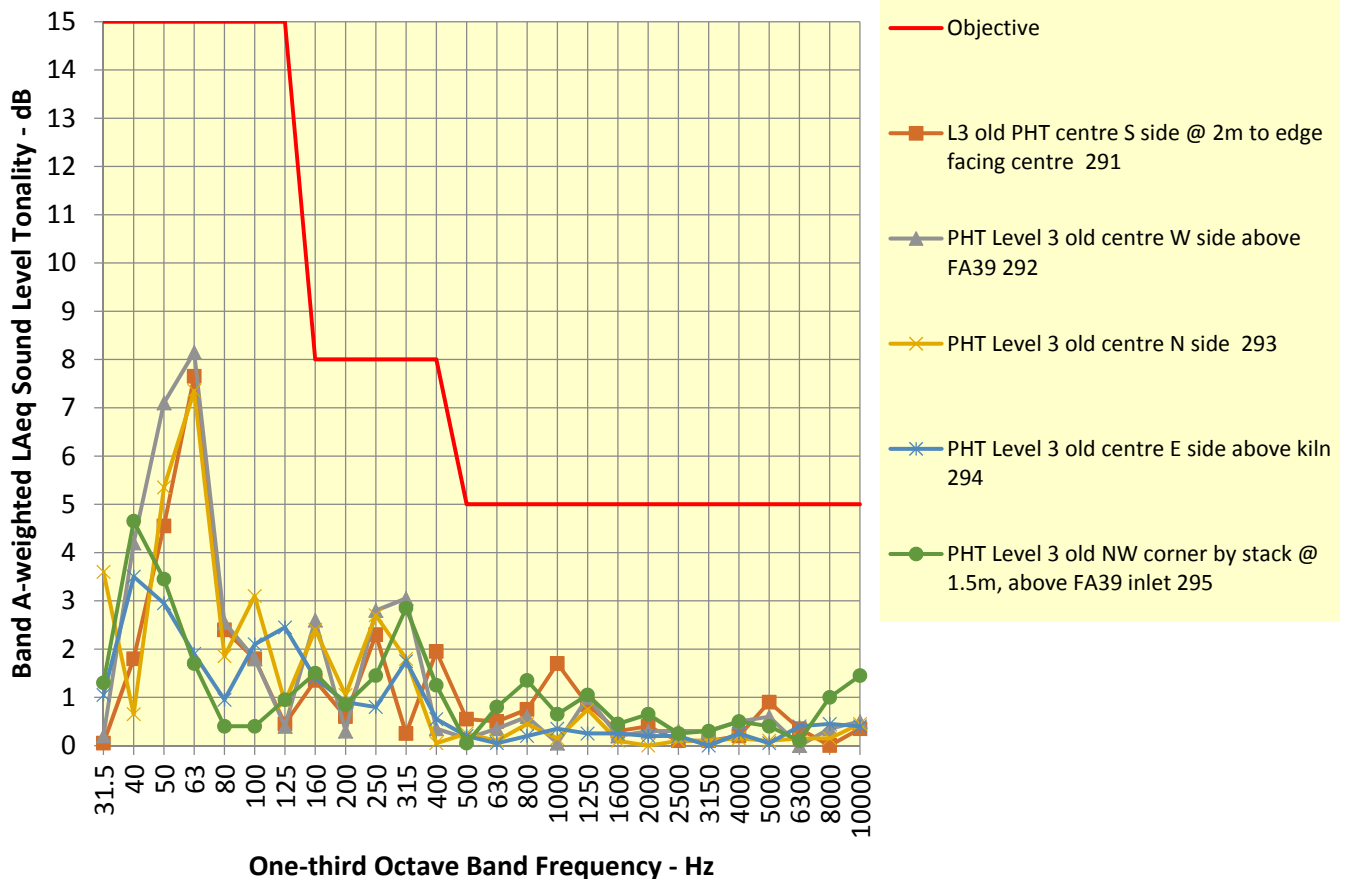


Figure A13A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 2.5

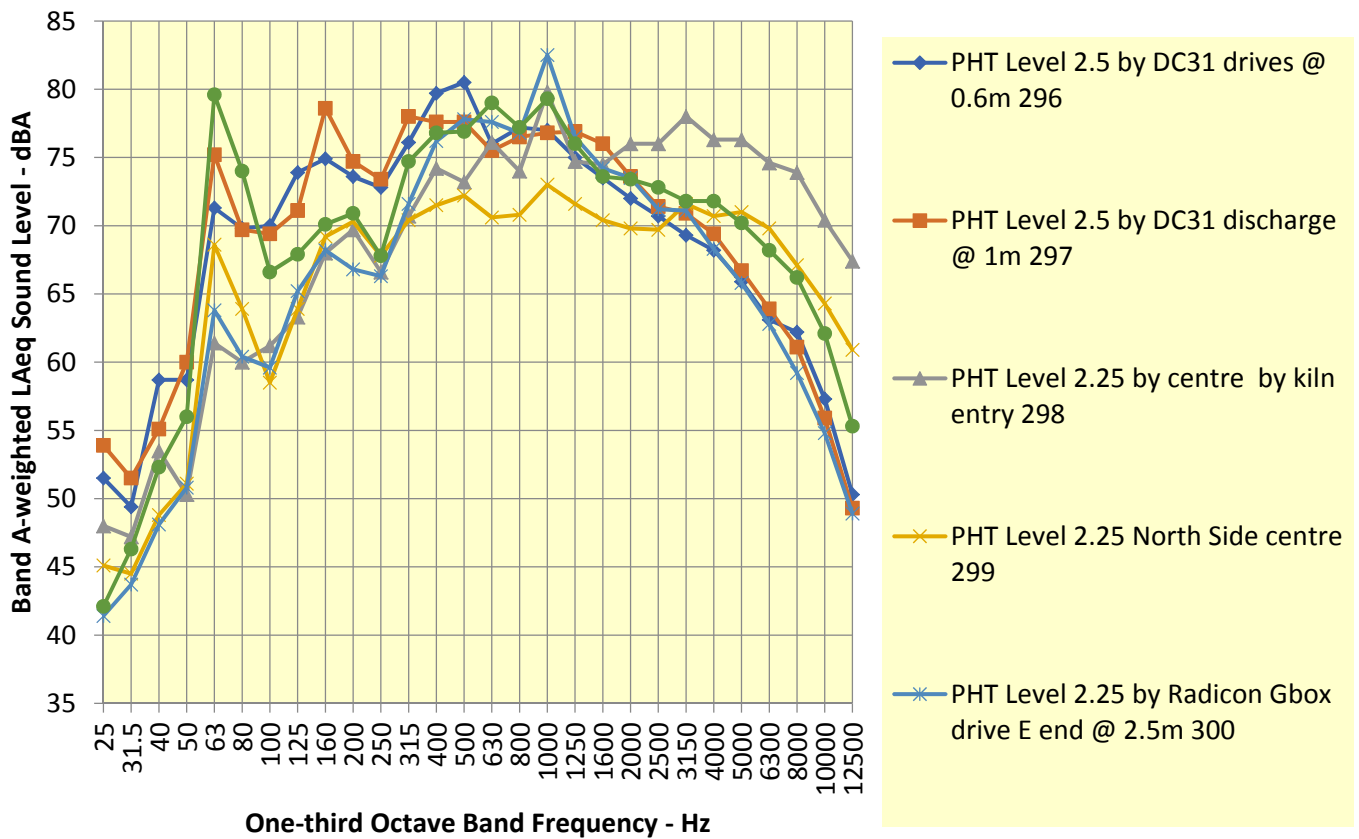


Figure A13B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 2.5

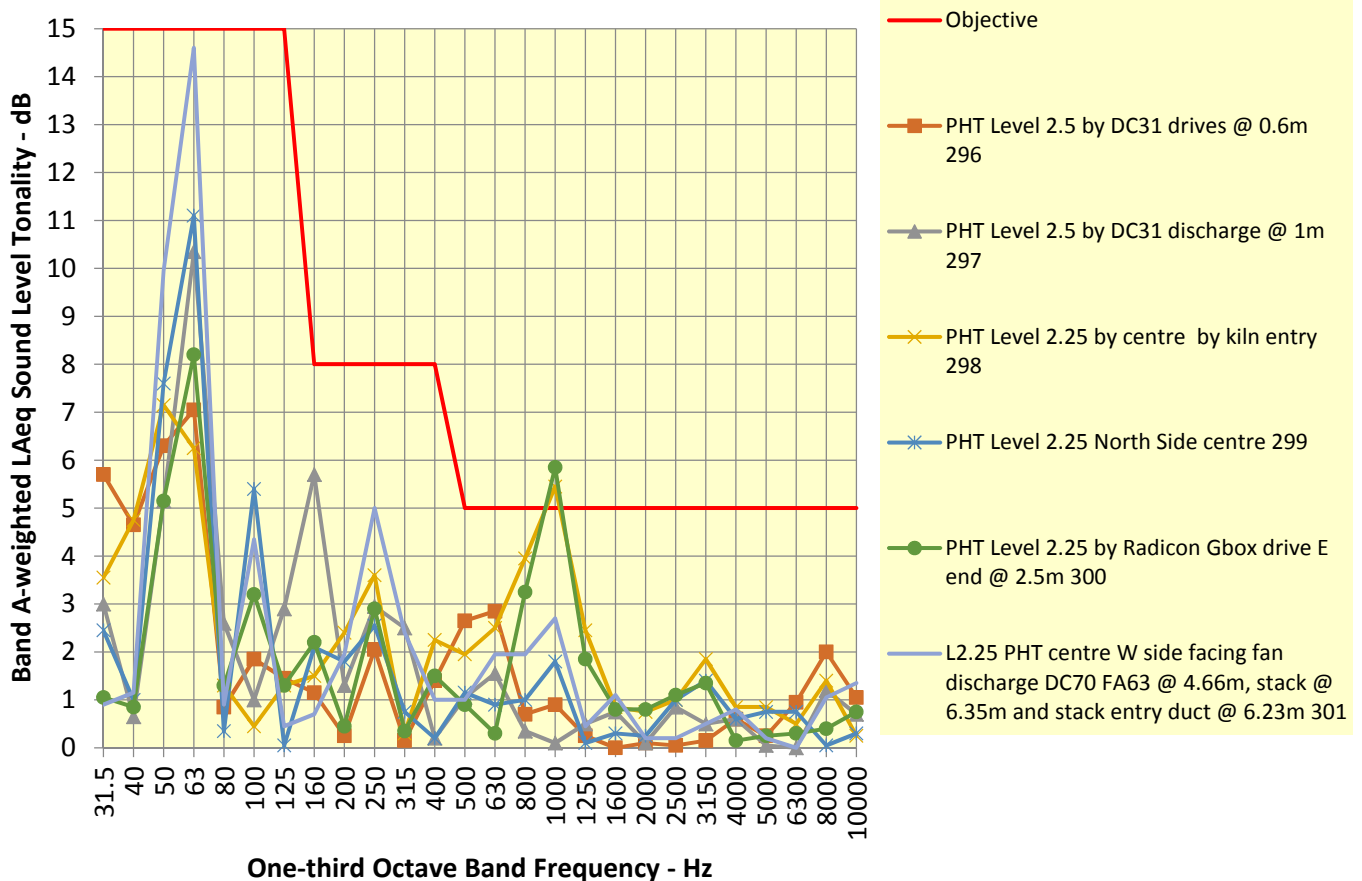


Figure A14A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 2

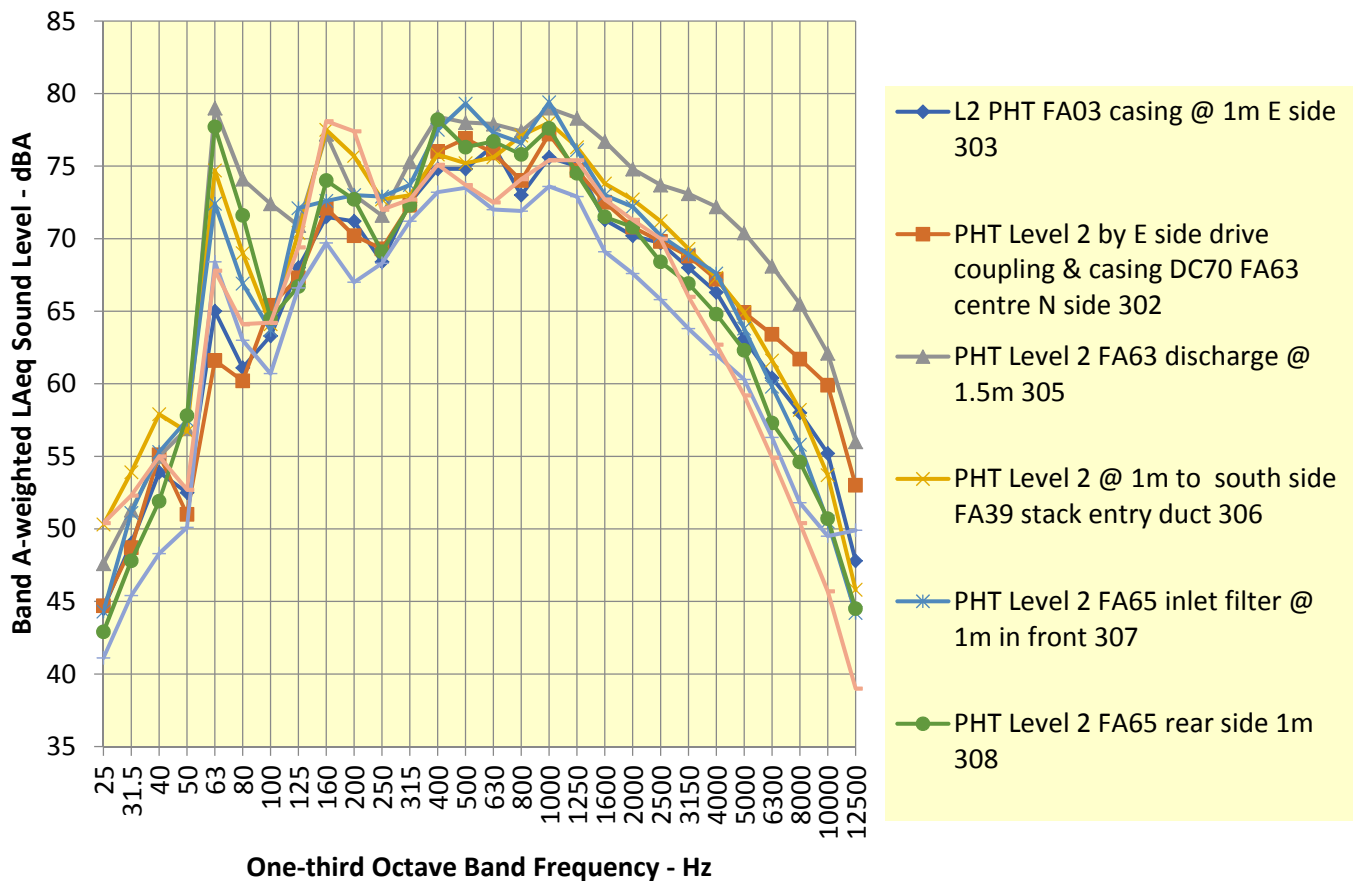


Figure A14B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 2

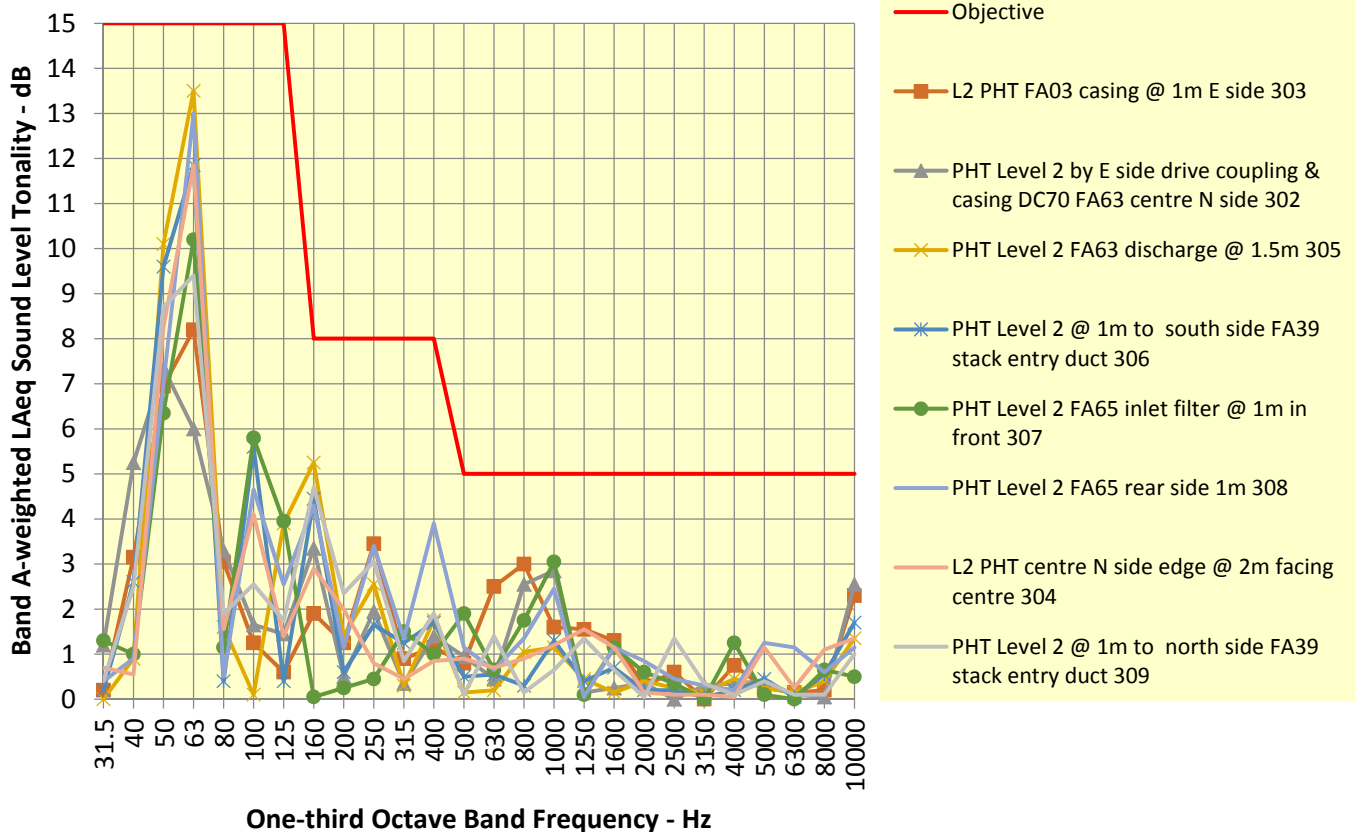


Figure A15A: Boral Cement Berrima Annual Noise 2019 Spectra
PHT Level 1

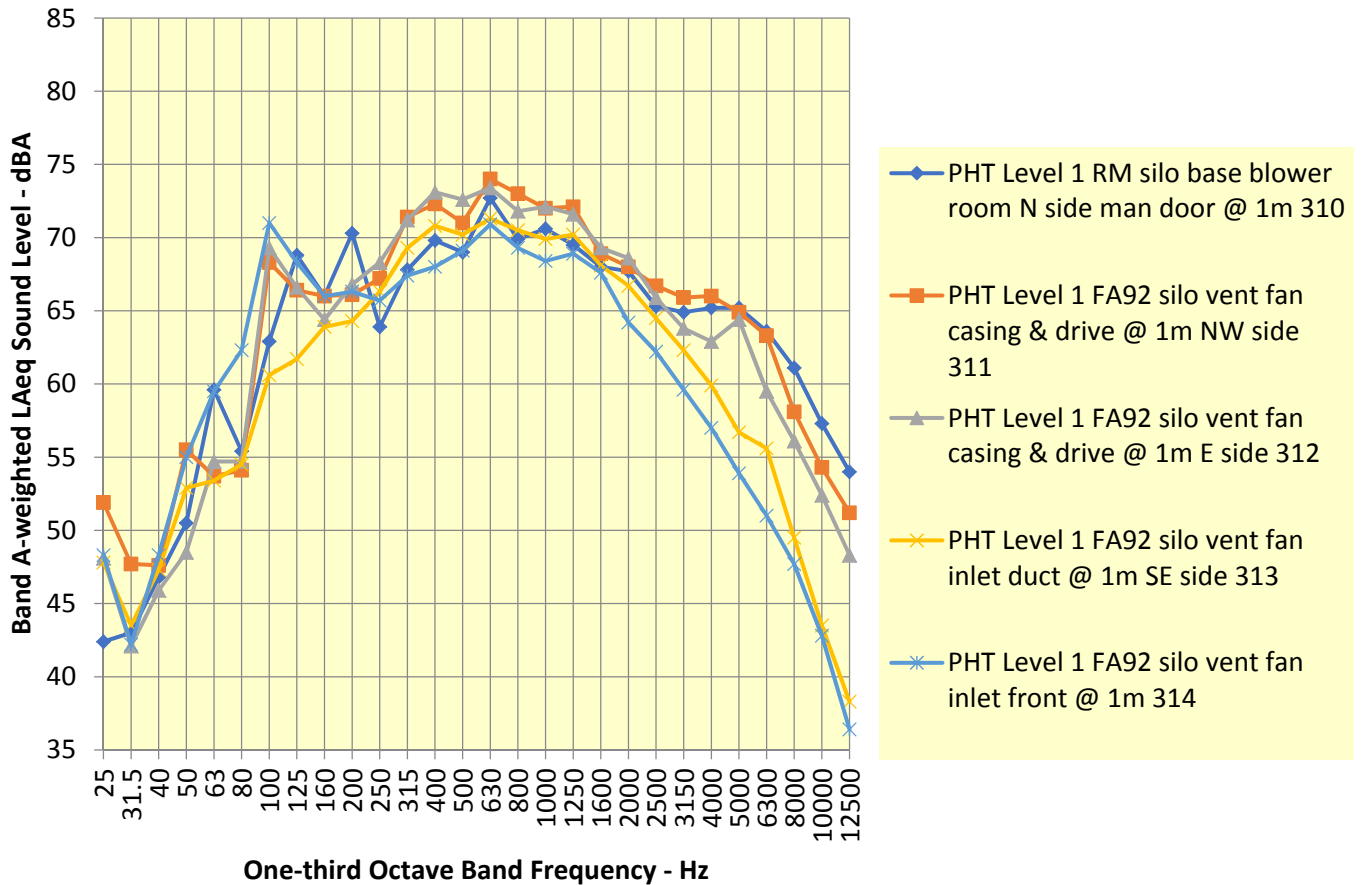


Figure A15B: Boral Cement Berrima Annual Noise 2019 Tonality
PHT Level 1

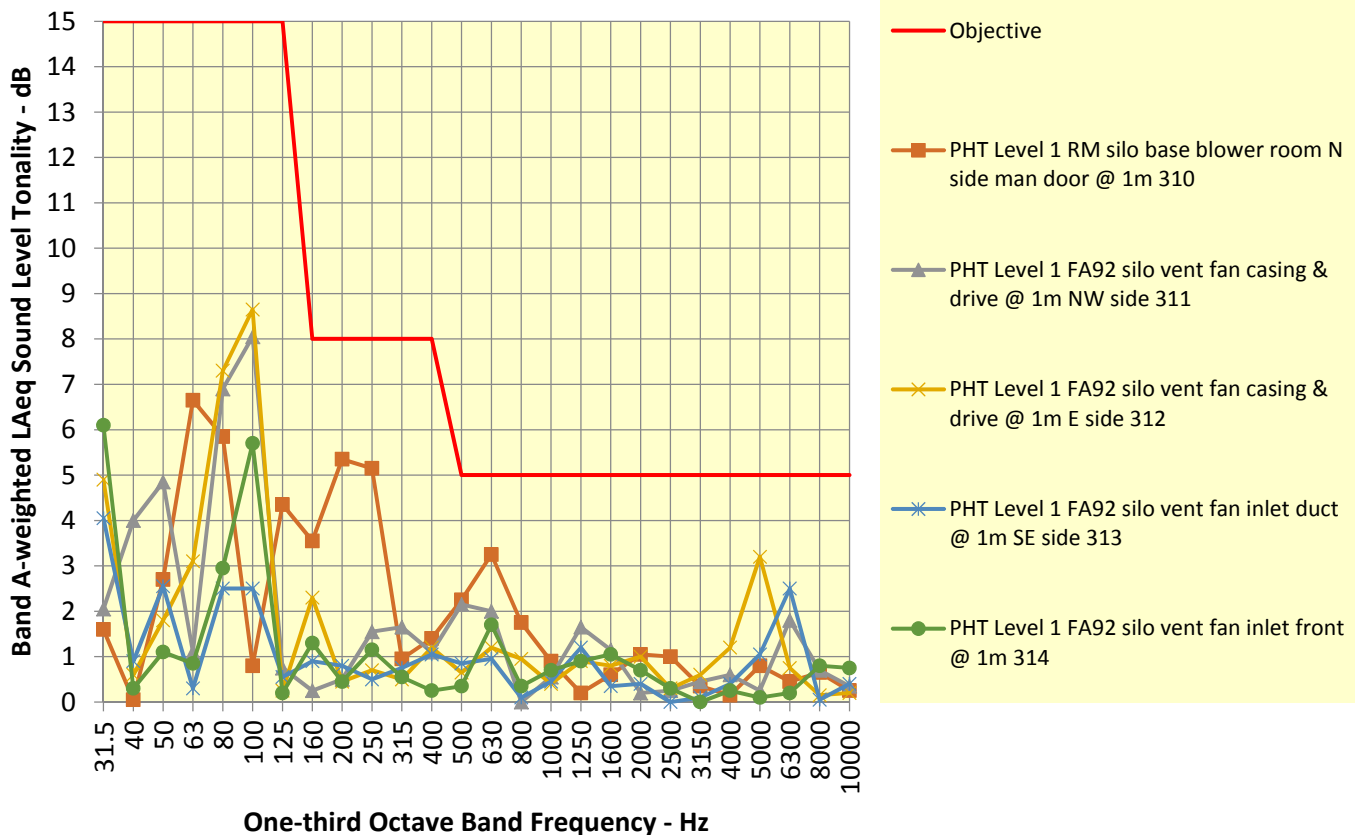


Figure A16A: Boral Cement Berrima Annual Noise 2019 Spectra

FA39

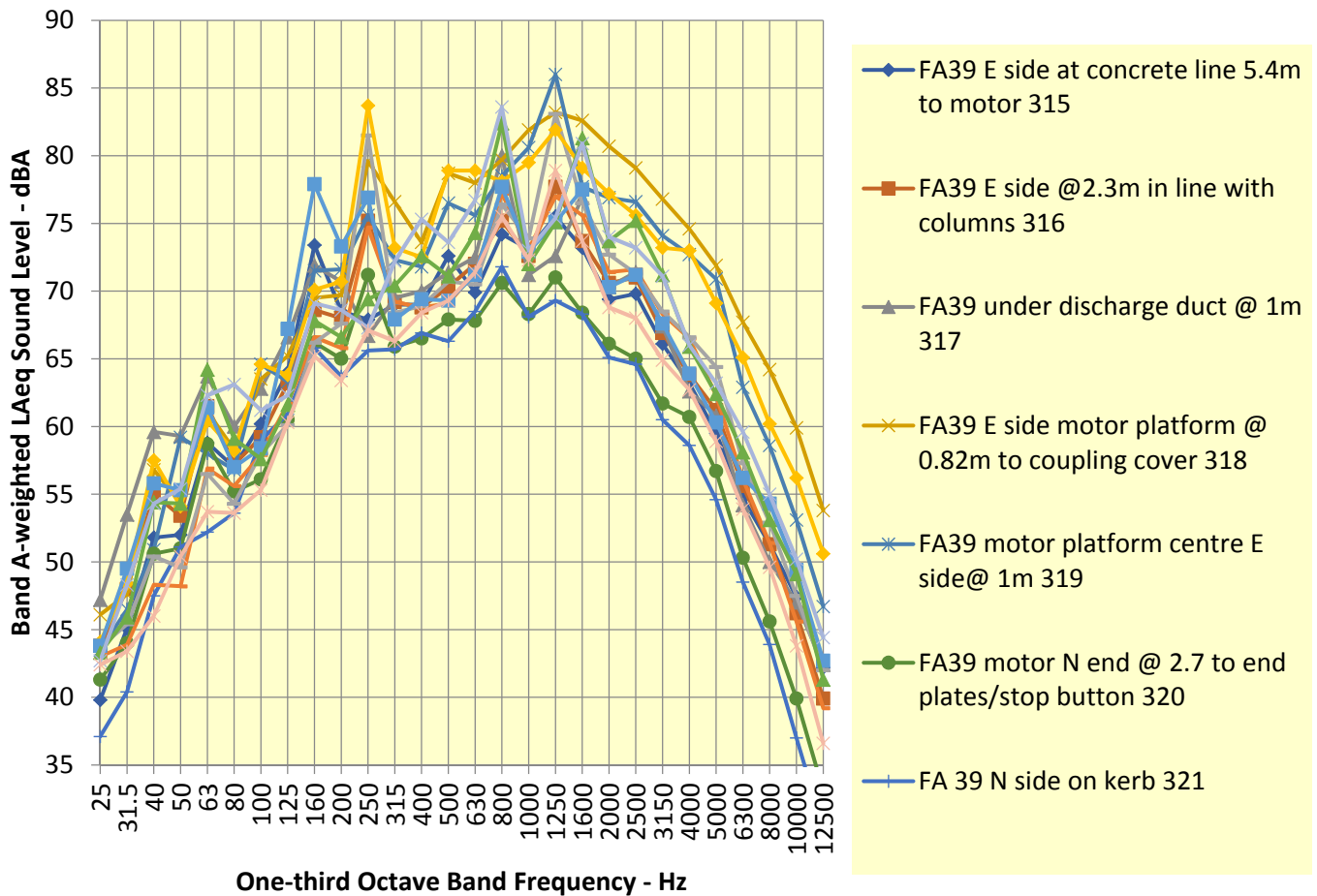


Figure A16B: Boral Cement Berrima Annual Noise 2019 Tonality

FA39

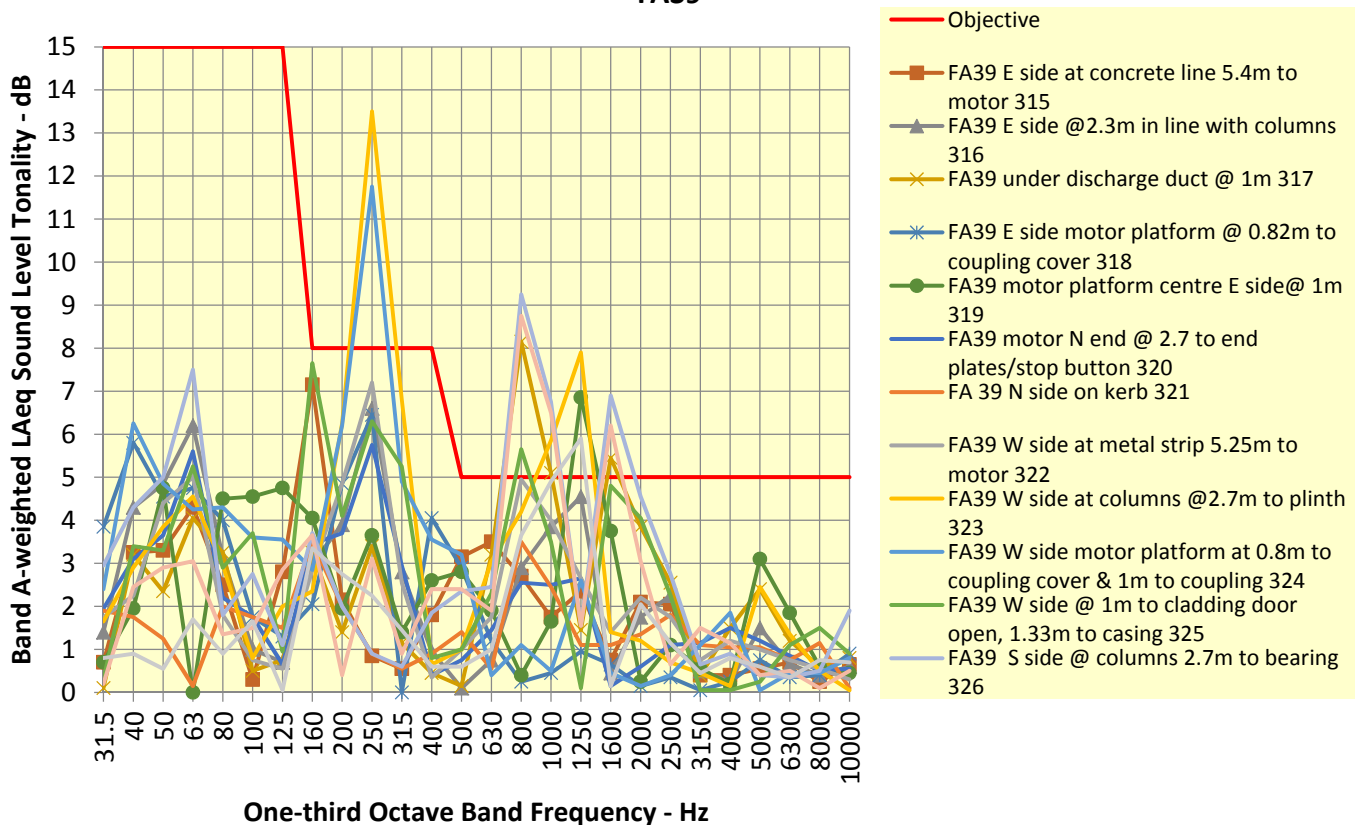


Figure A17A: Boral Cement Berrima Annual Noise 2019 Spectra

FA38

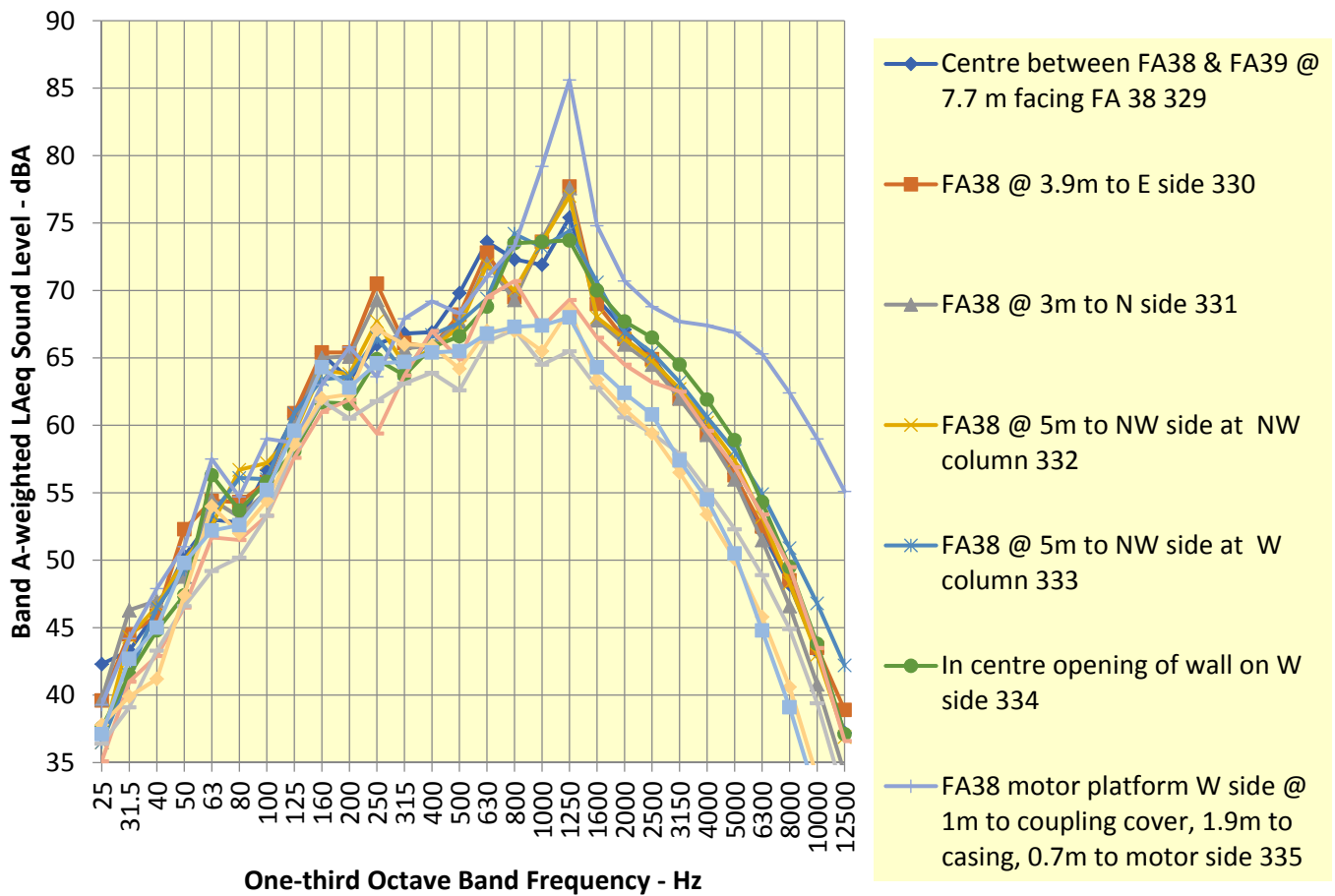


Figure A17B: Boral Cement Berrima Annual Noise 2019 Tonality

FA38

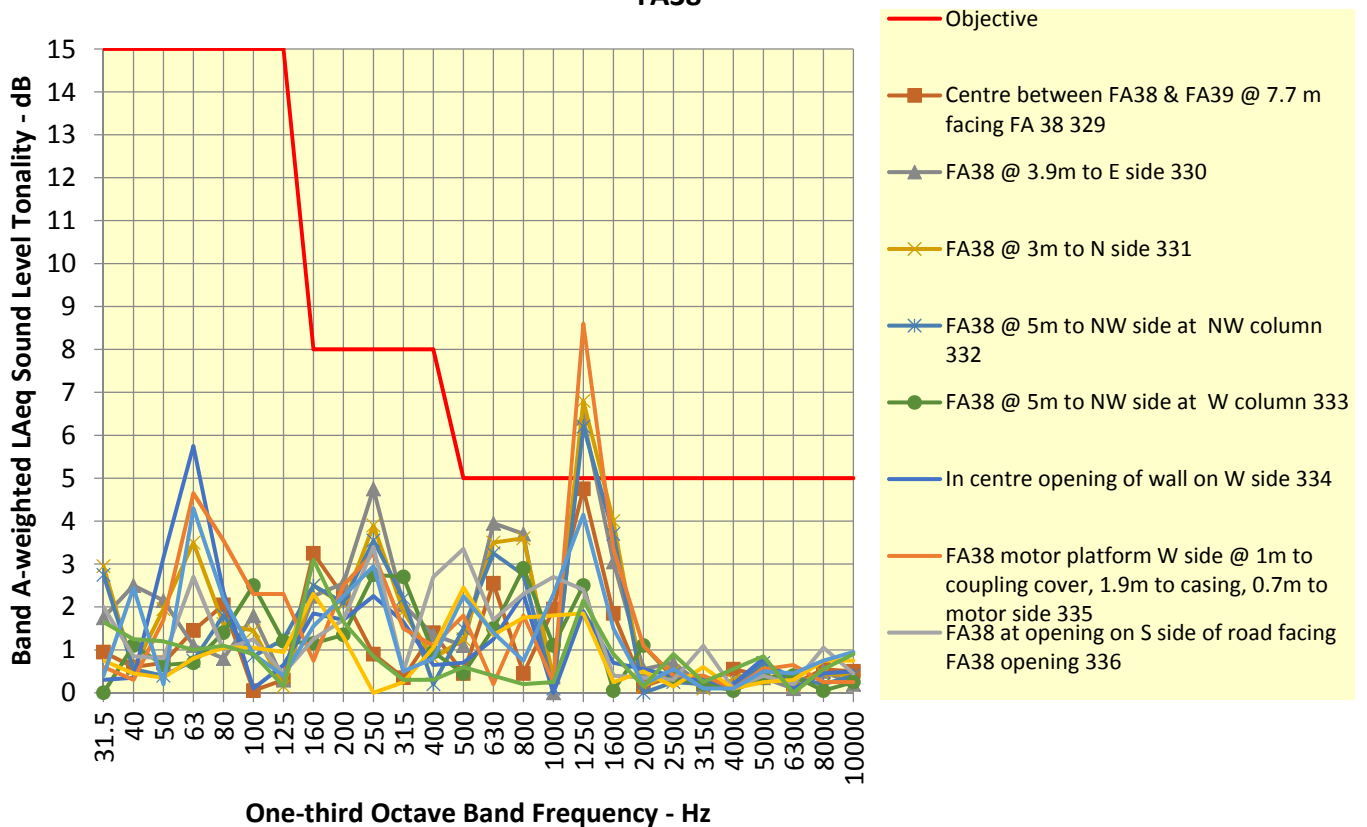


**Figure A18A: Boral Cement Berrima Annual Noise 2019 Spectra
RM6**

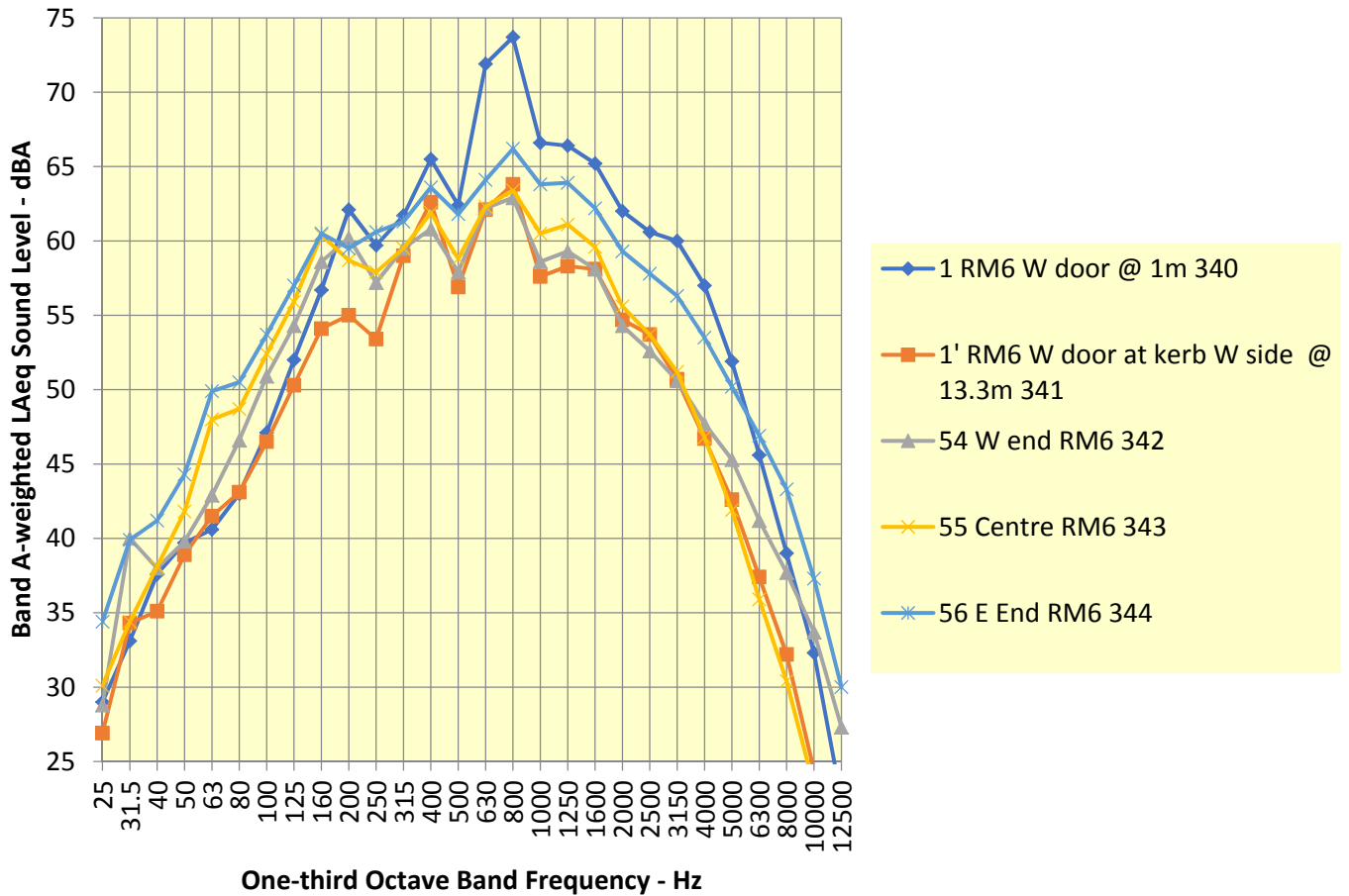


**Figure A18B: Boral Cement Berrima Annual Noise 2019 Tonality
RM6**

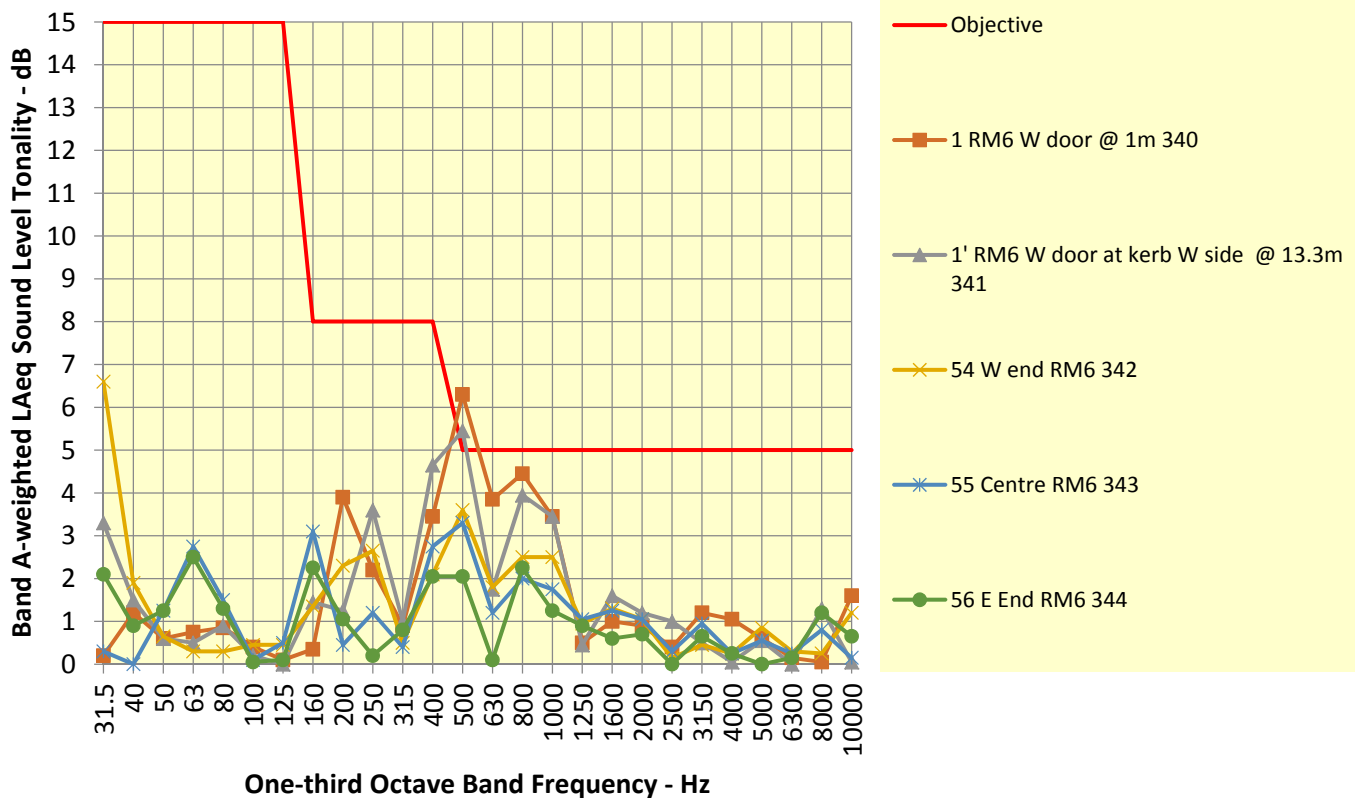


**Figure A19A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Outside**

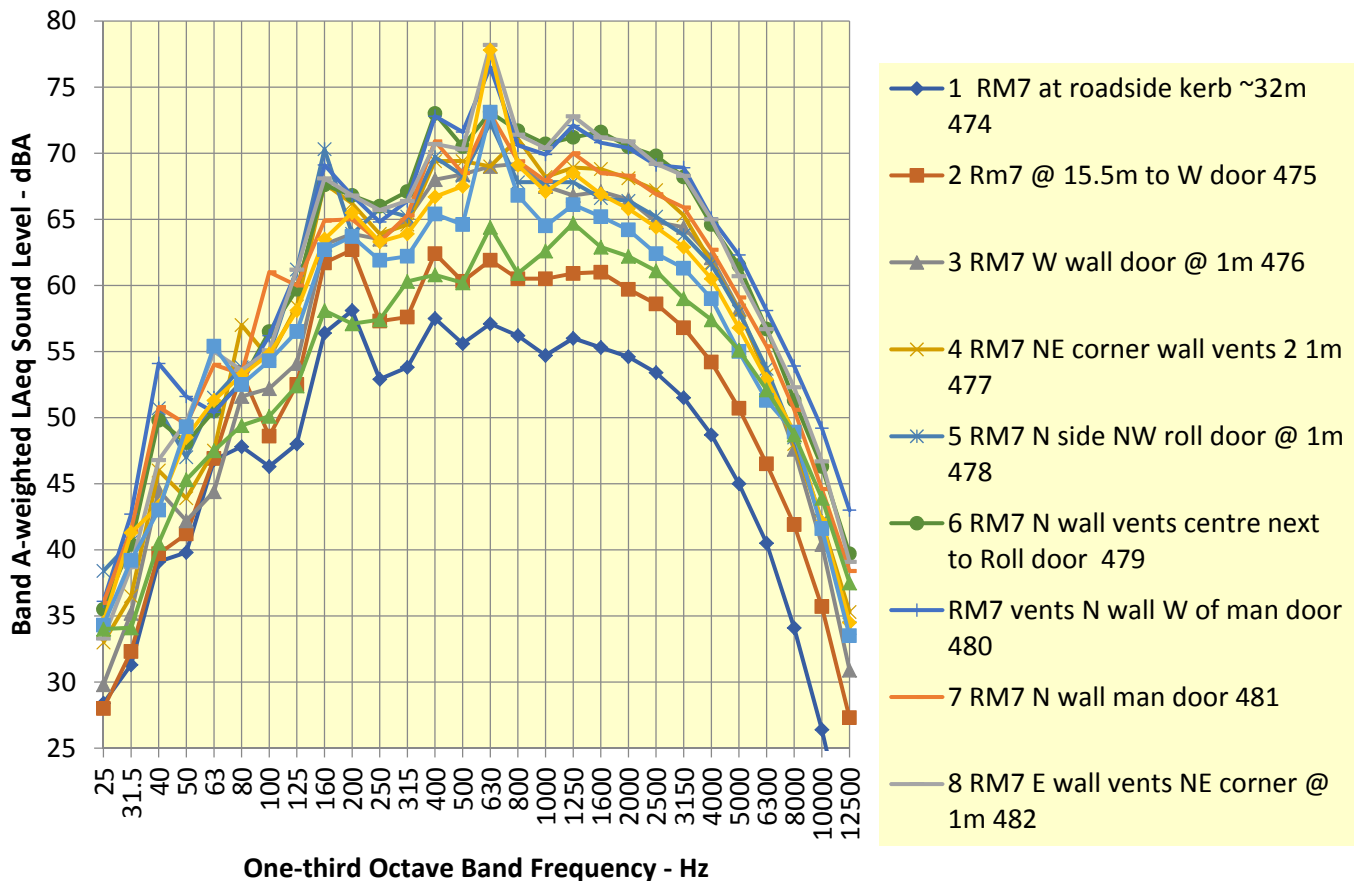


**Figure A19B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Outside**

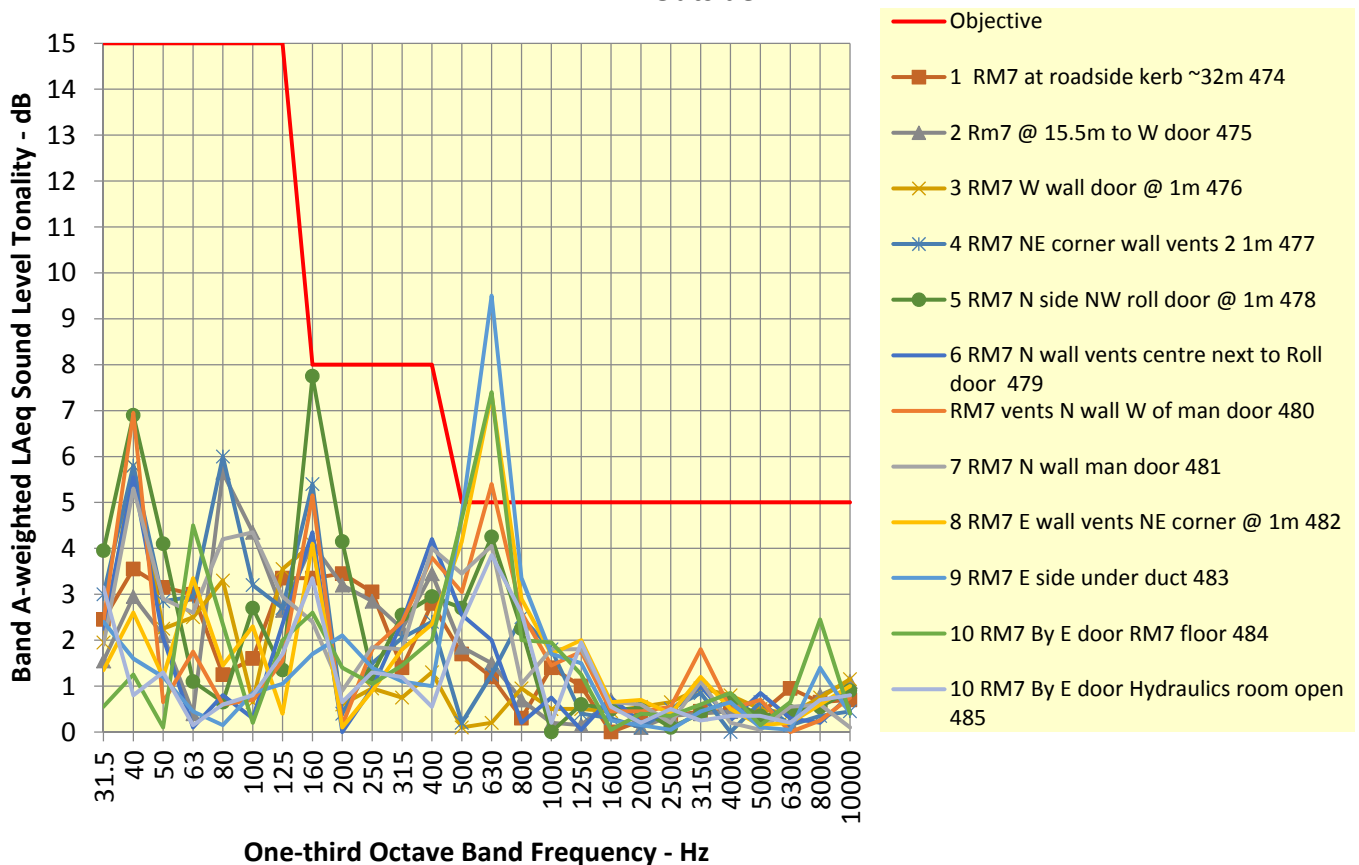


**Figure A20A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Compressor House Area**

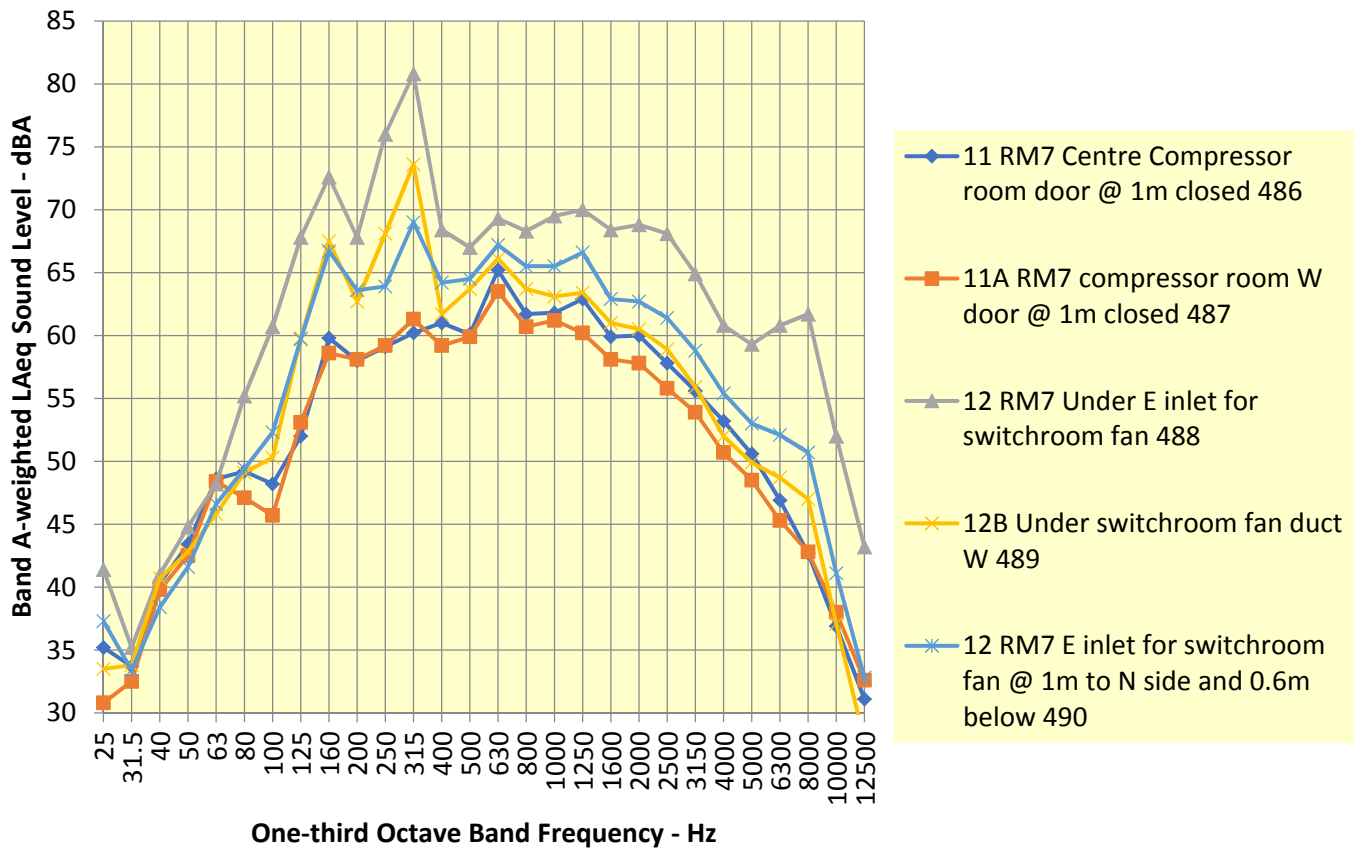


**Figure A20B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Compressor House Area**

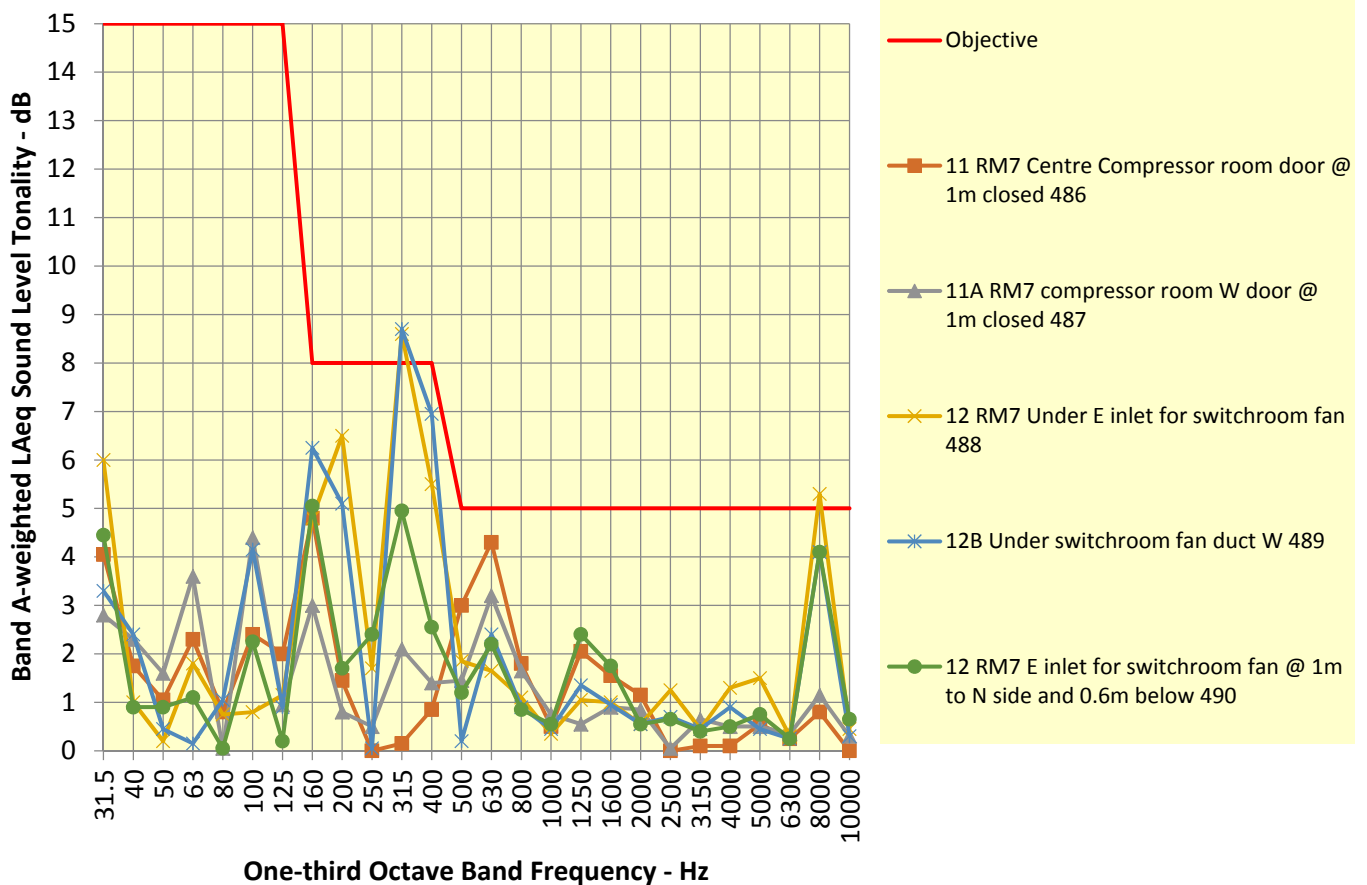


**Figure A21A: Boral Cement Berrima Annual Noise 2019 Spectra
FA249**

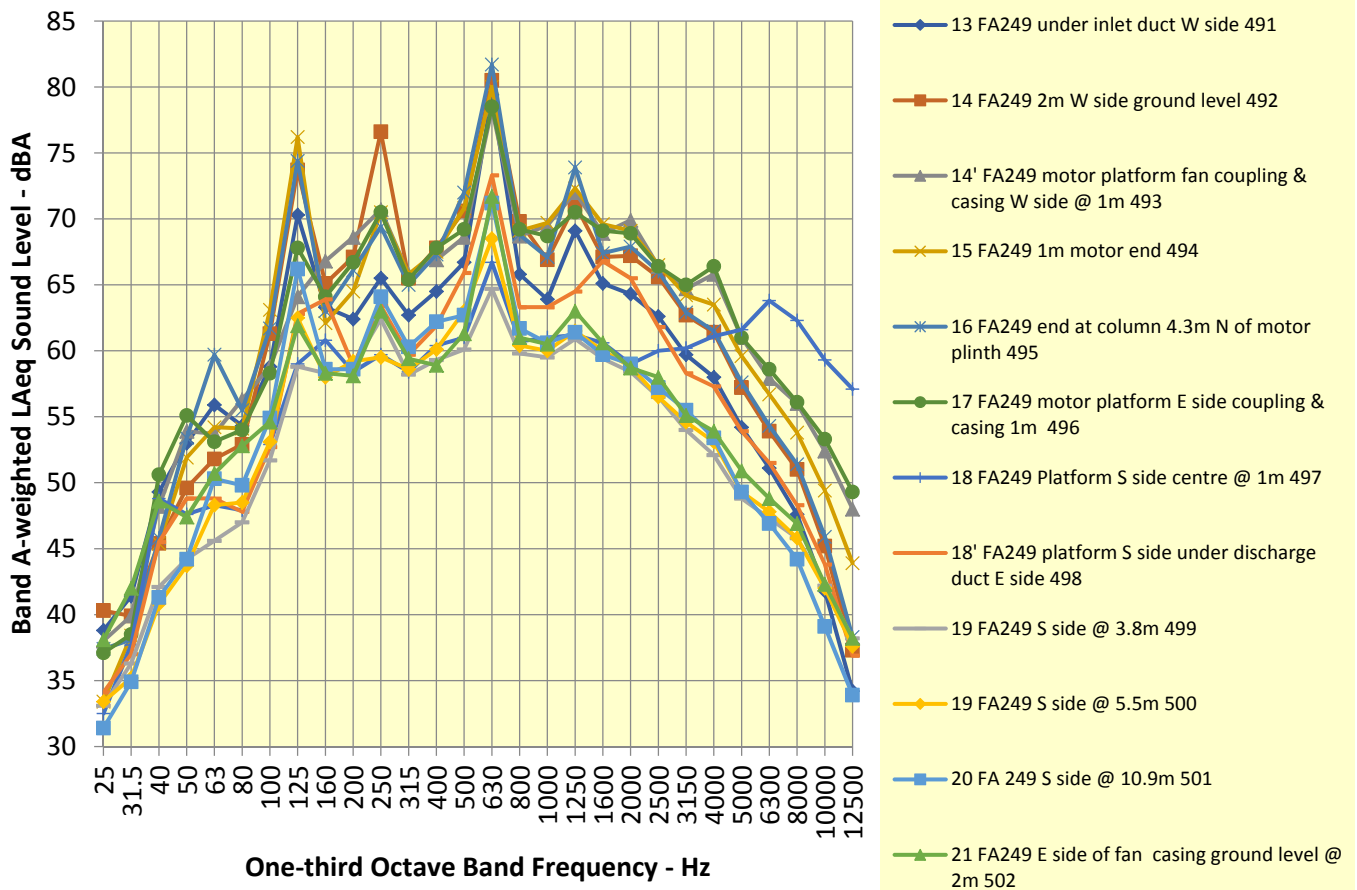


**Figure A21B: Boral Cement Berrima Annual Noise 2019 Tonality
FA249**

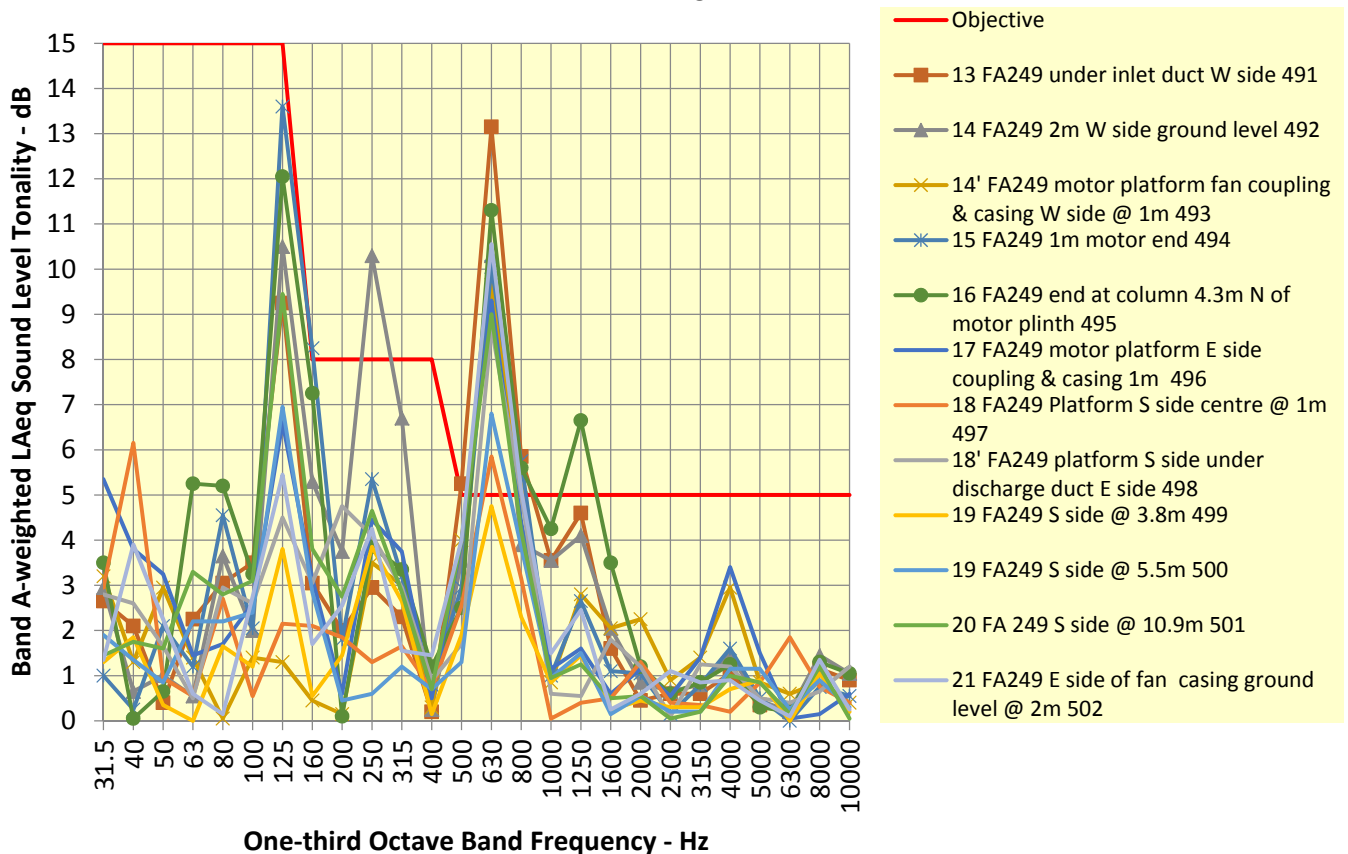


Figure A22A: Boral Cement Berrima Annual Noise 2019 Spectra
FA250

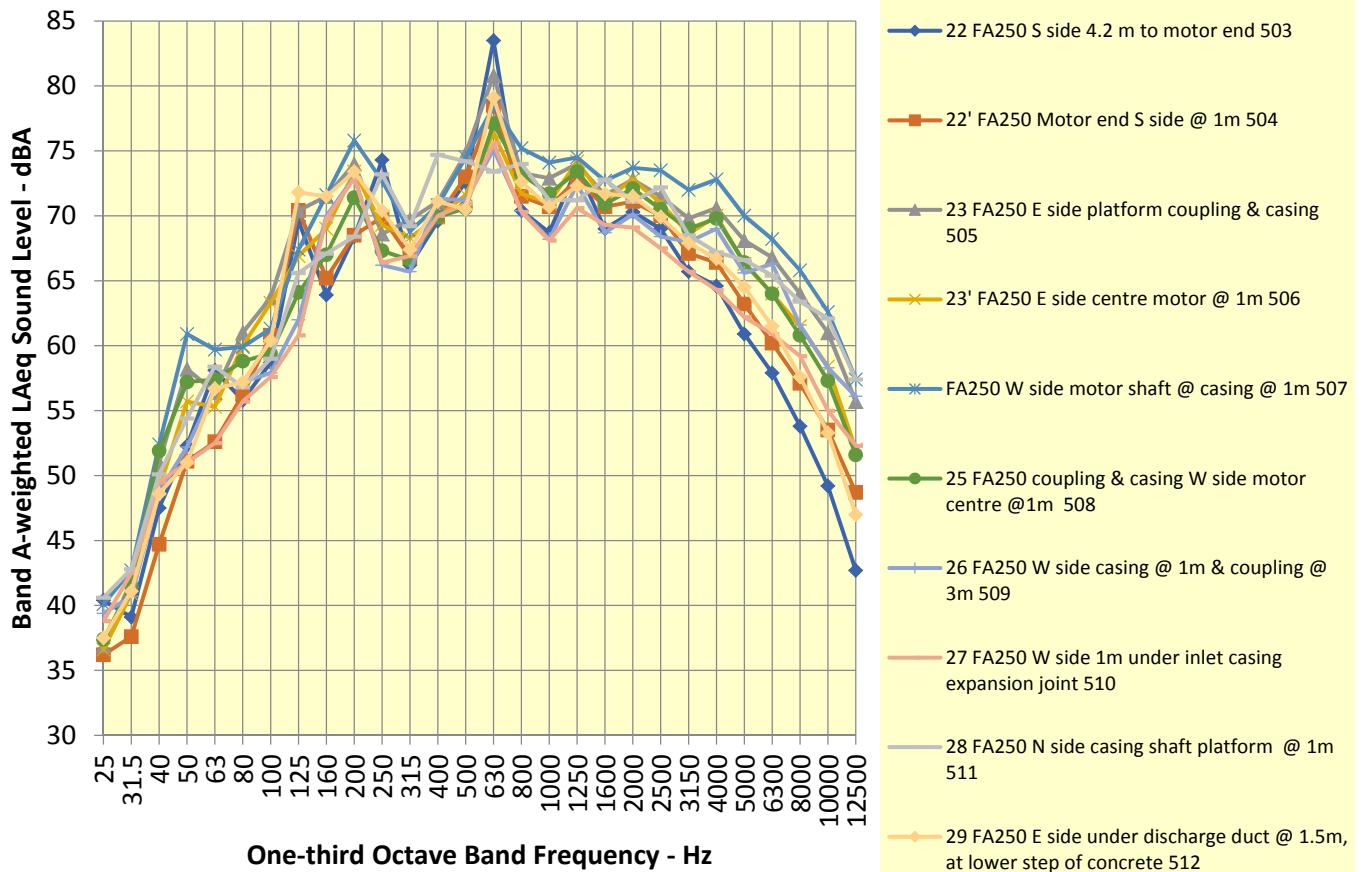


Figure A22B: Boral Cement Berrima Annual Noise 2019 Tonality
FA250

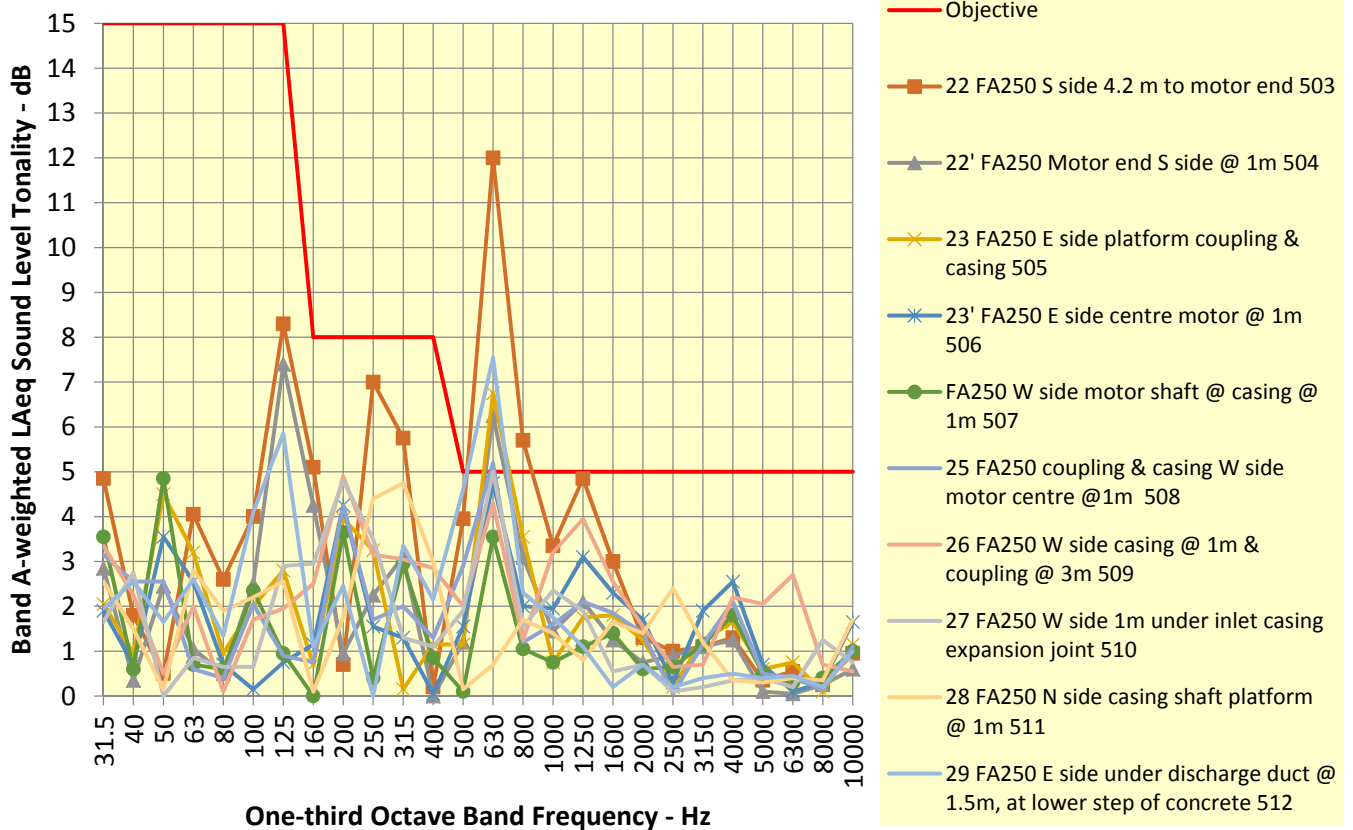


Figure A23A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Roof Platform Lower

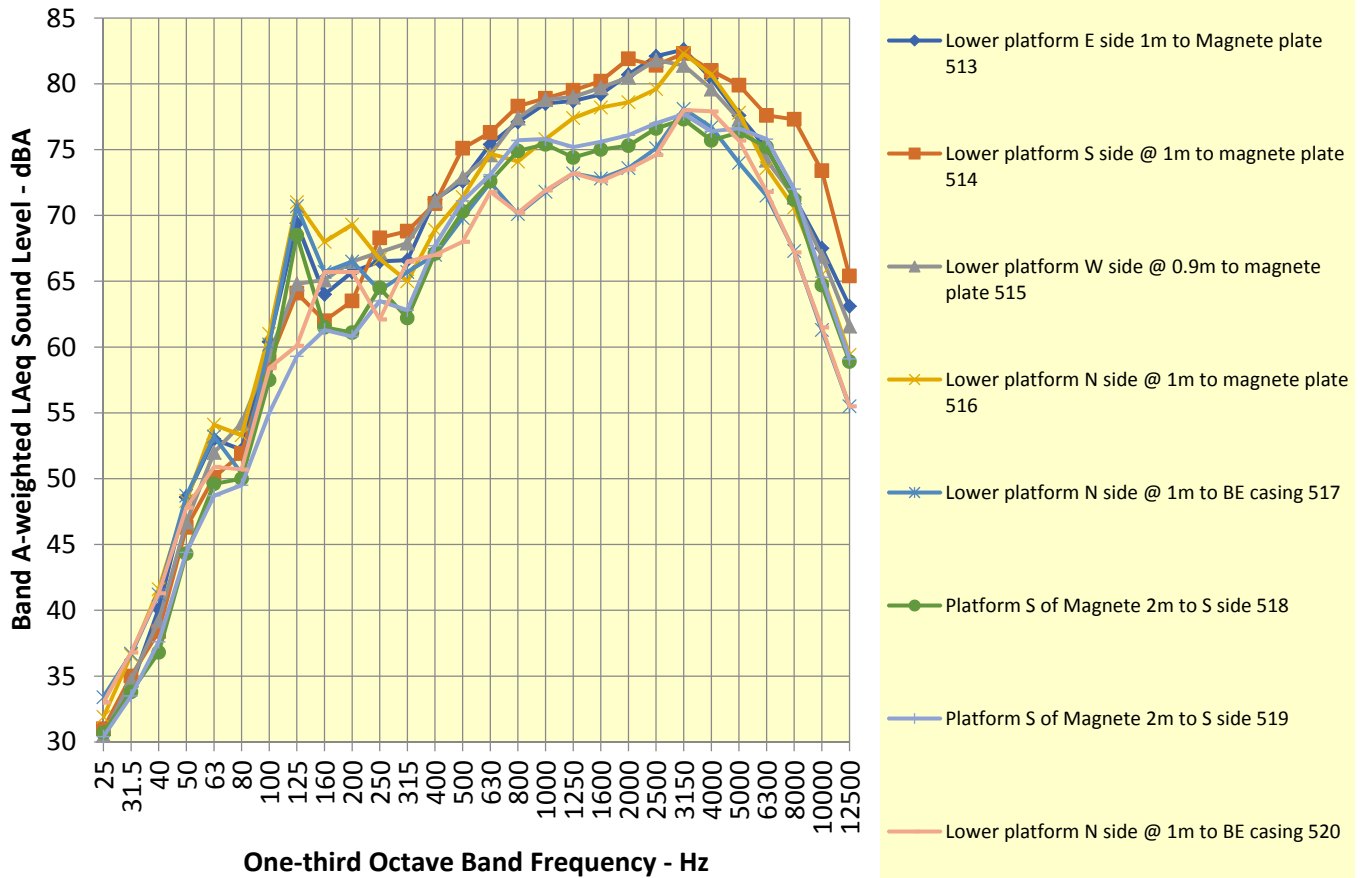


Figure A23B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Roof Platform Lower

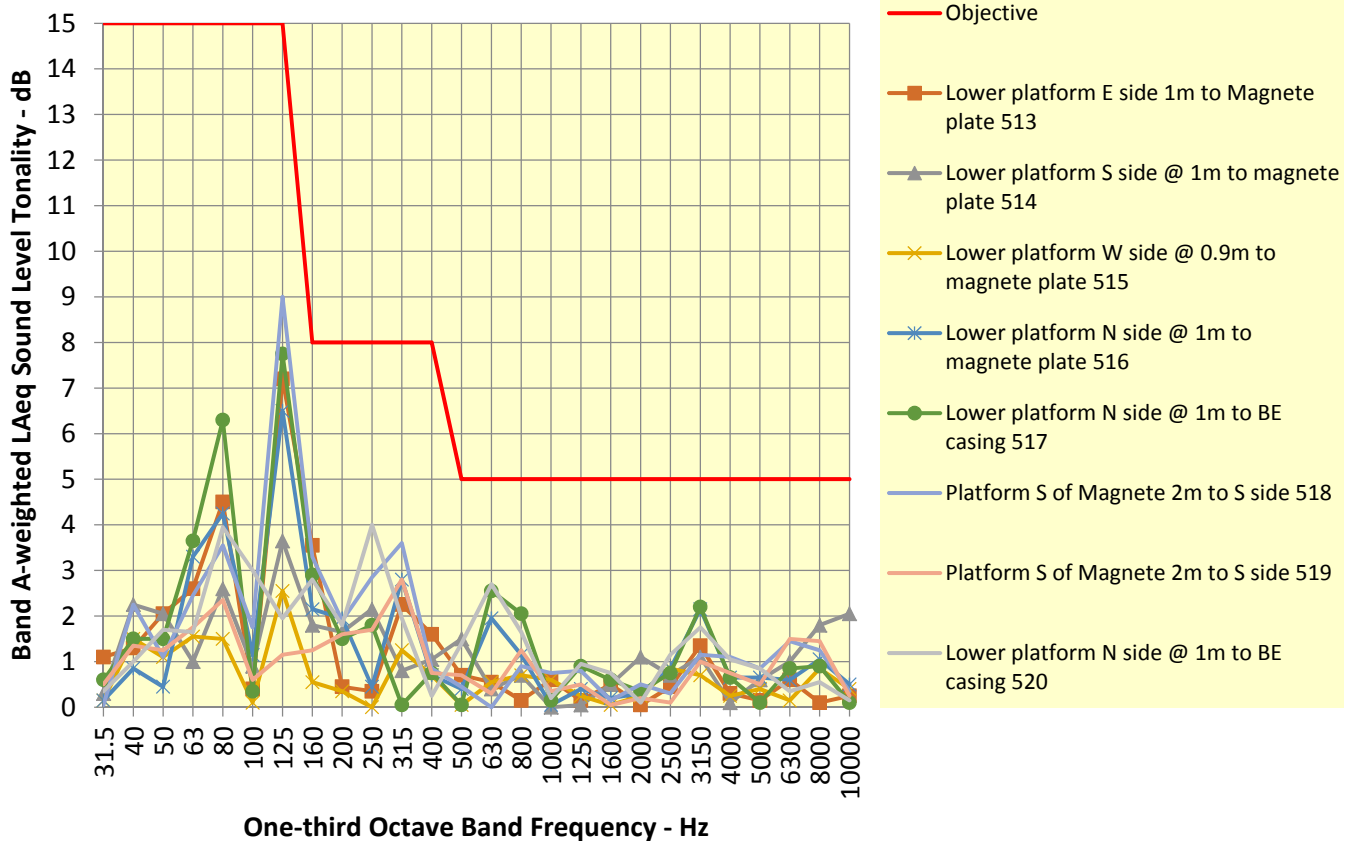


**Figure A24A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Roof Platform Upper**

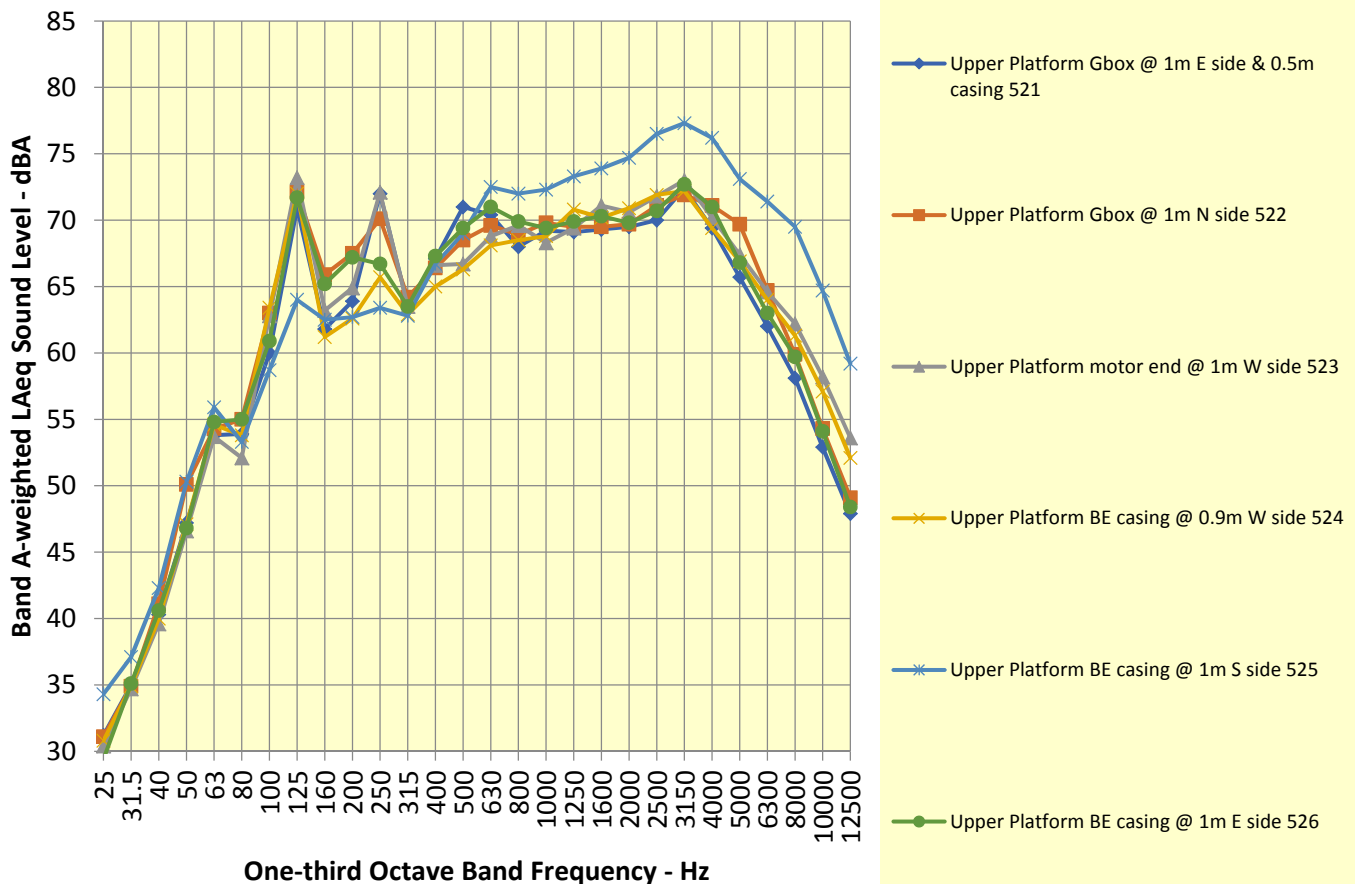


**Figure A24B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Roof Platform Upper**

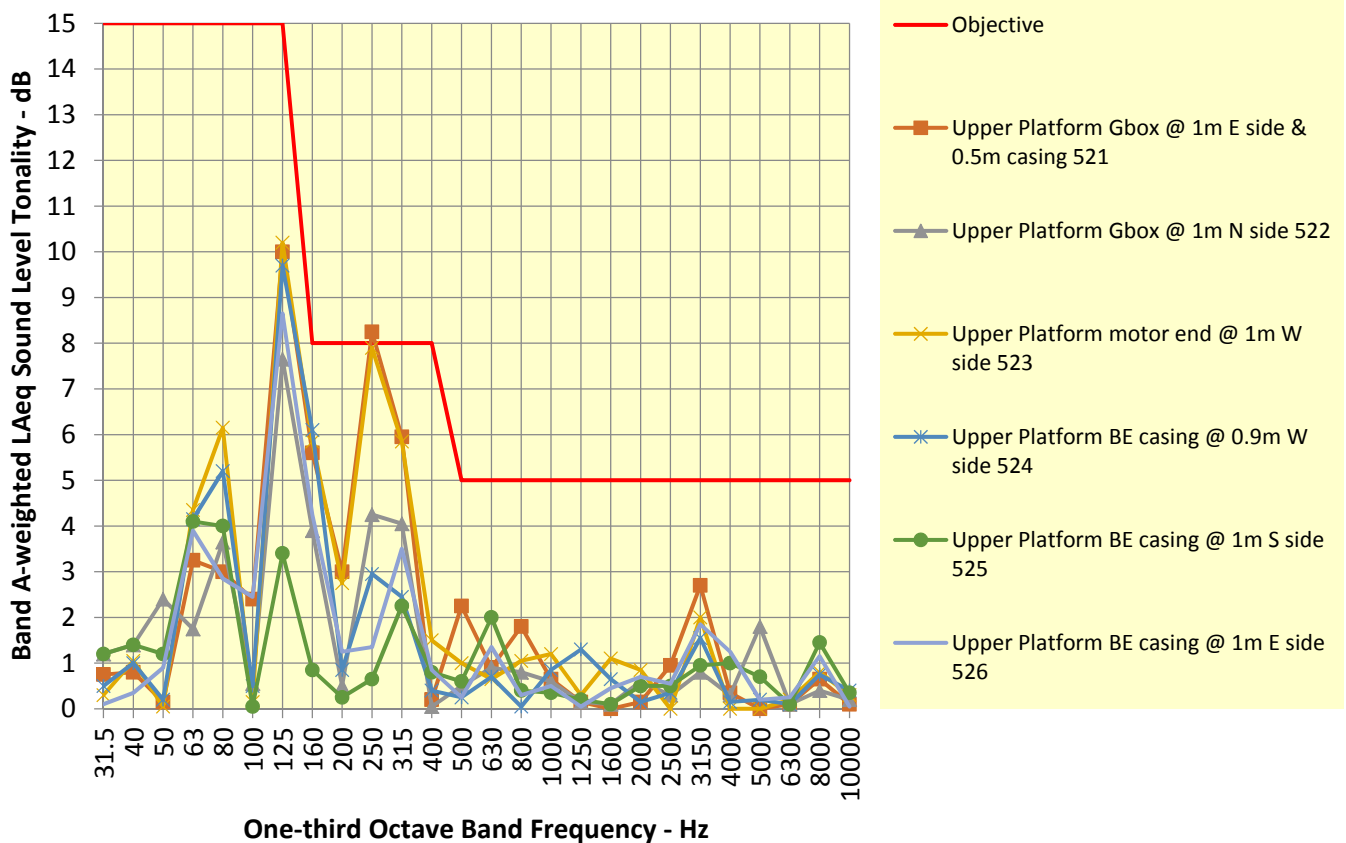


**Figure A25A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Baghouse Tower**

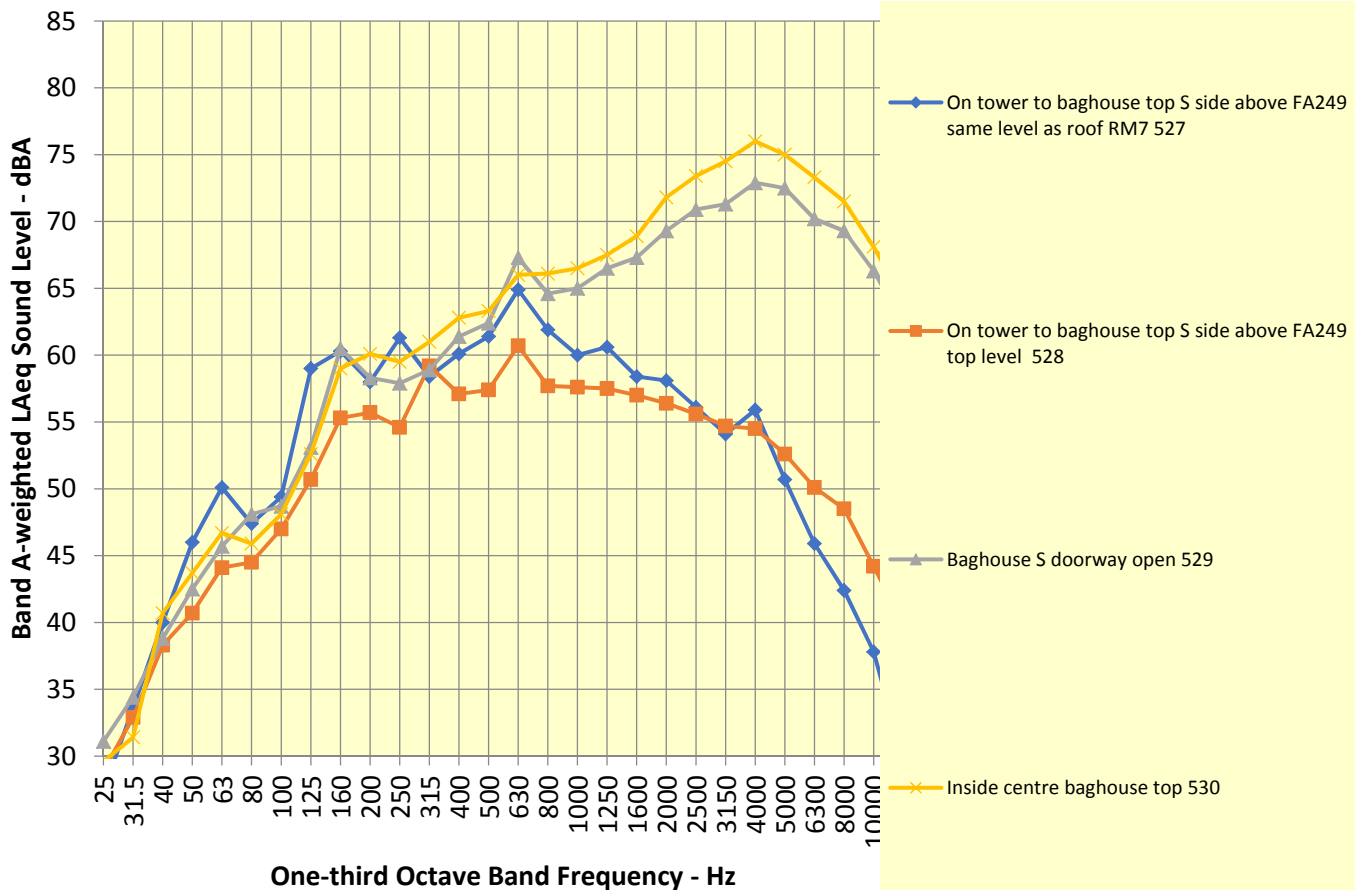


**Figure A25B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Baghouse Tower**

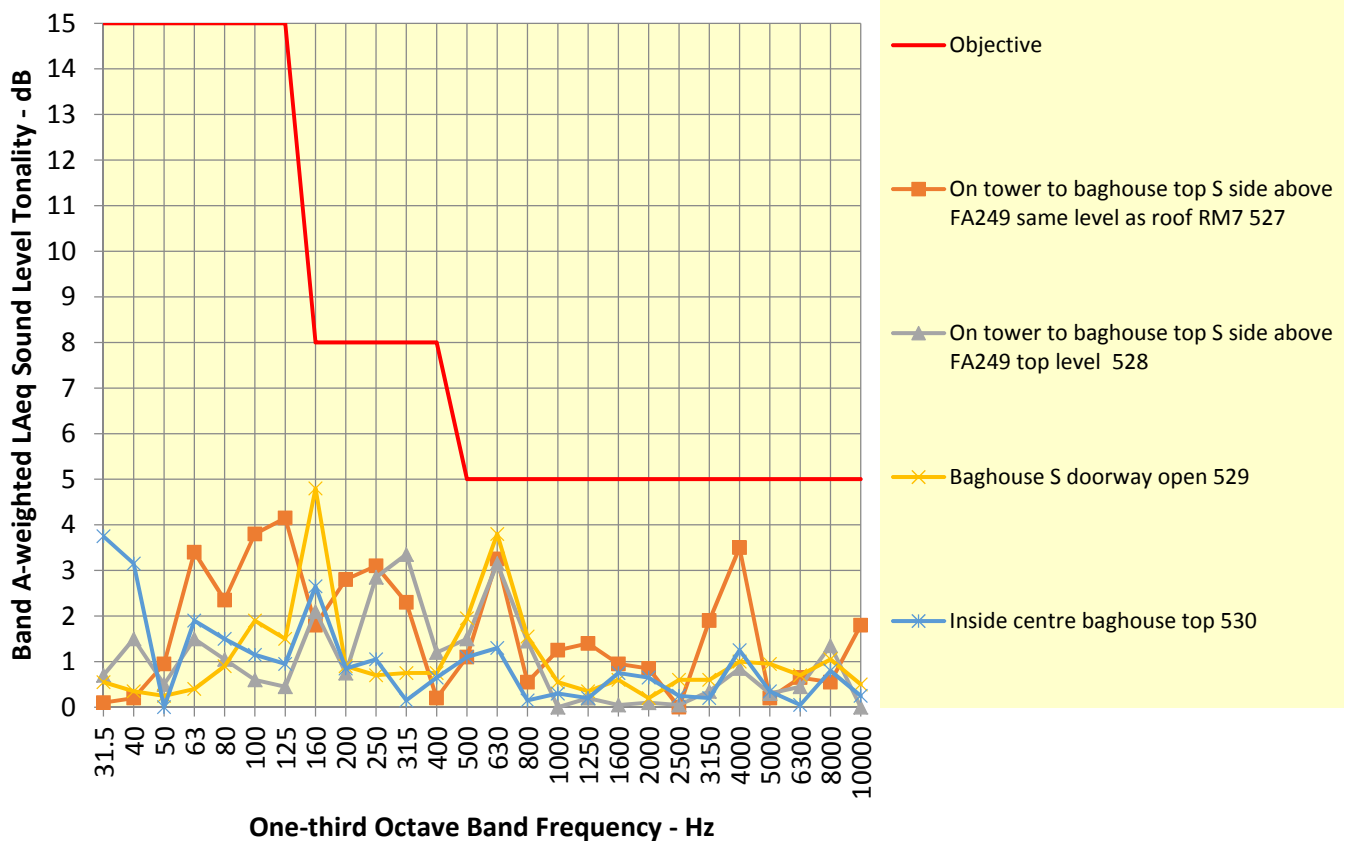


Figure A26A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Inside Top Level

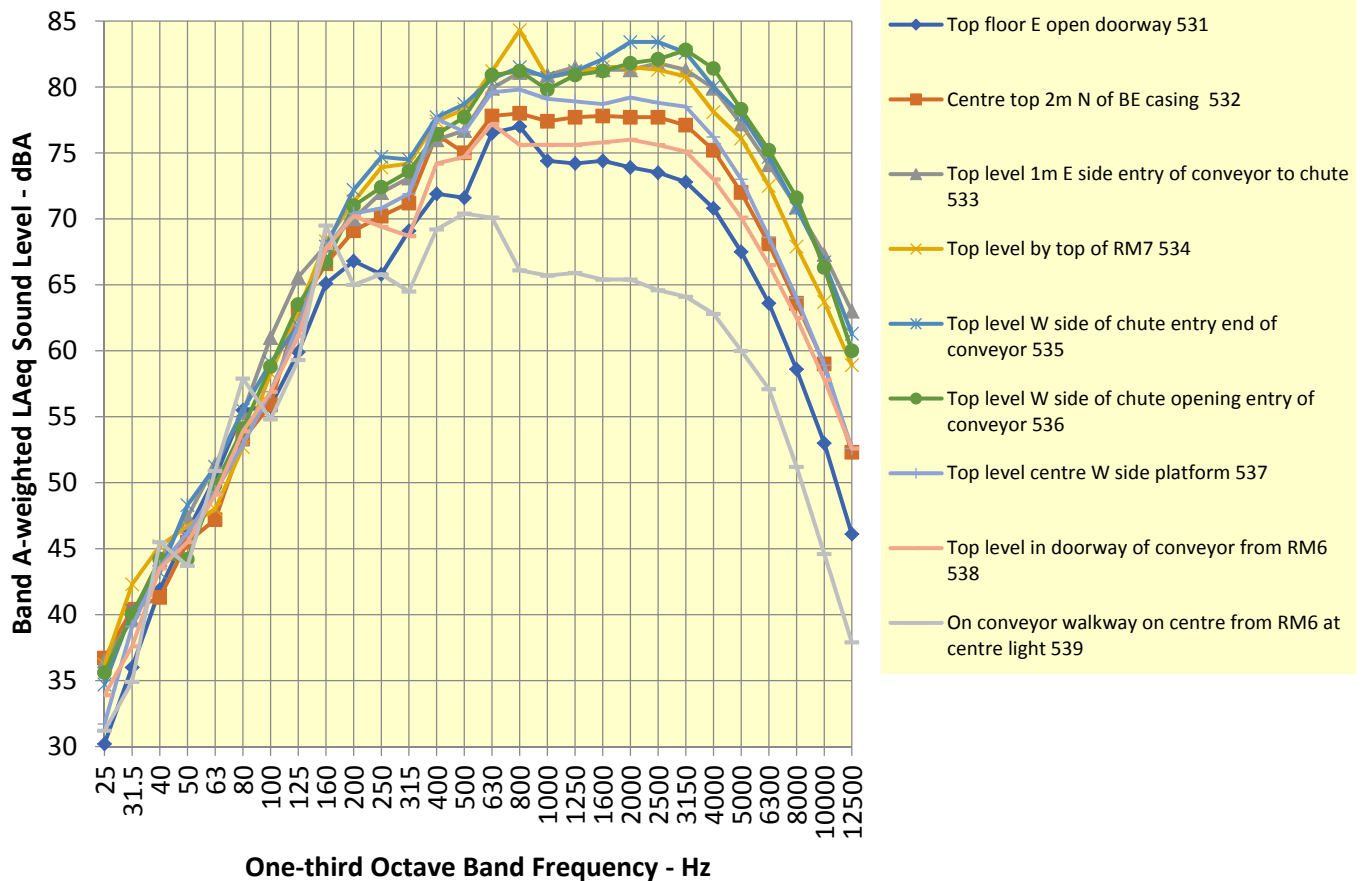


Figure A26B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Inside Top Level

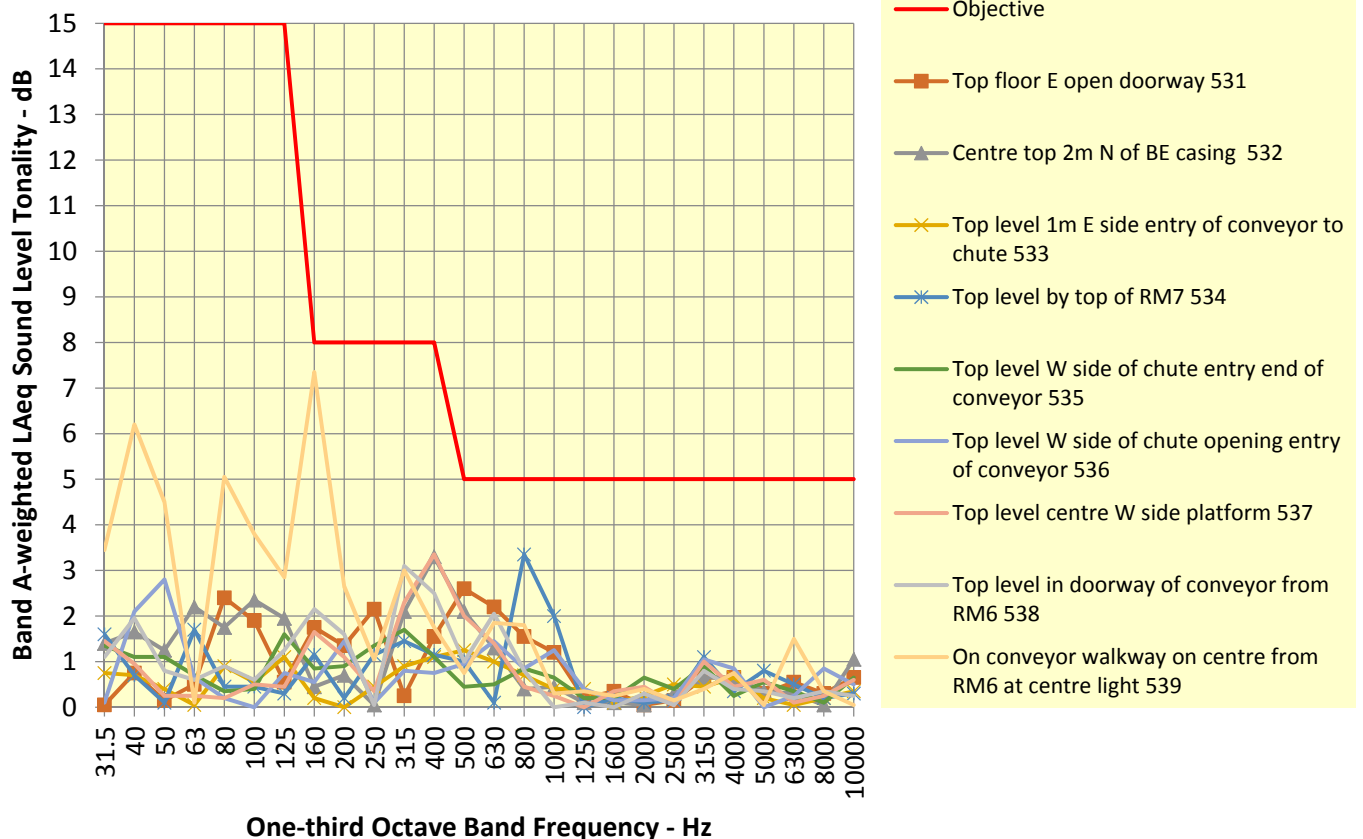


**Figure A27A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Inside Levels 1 to 3**

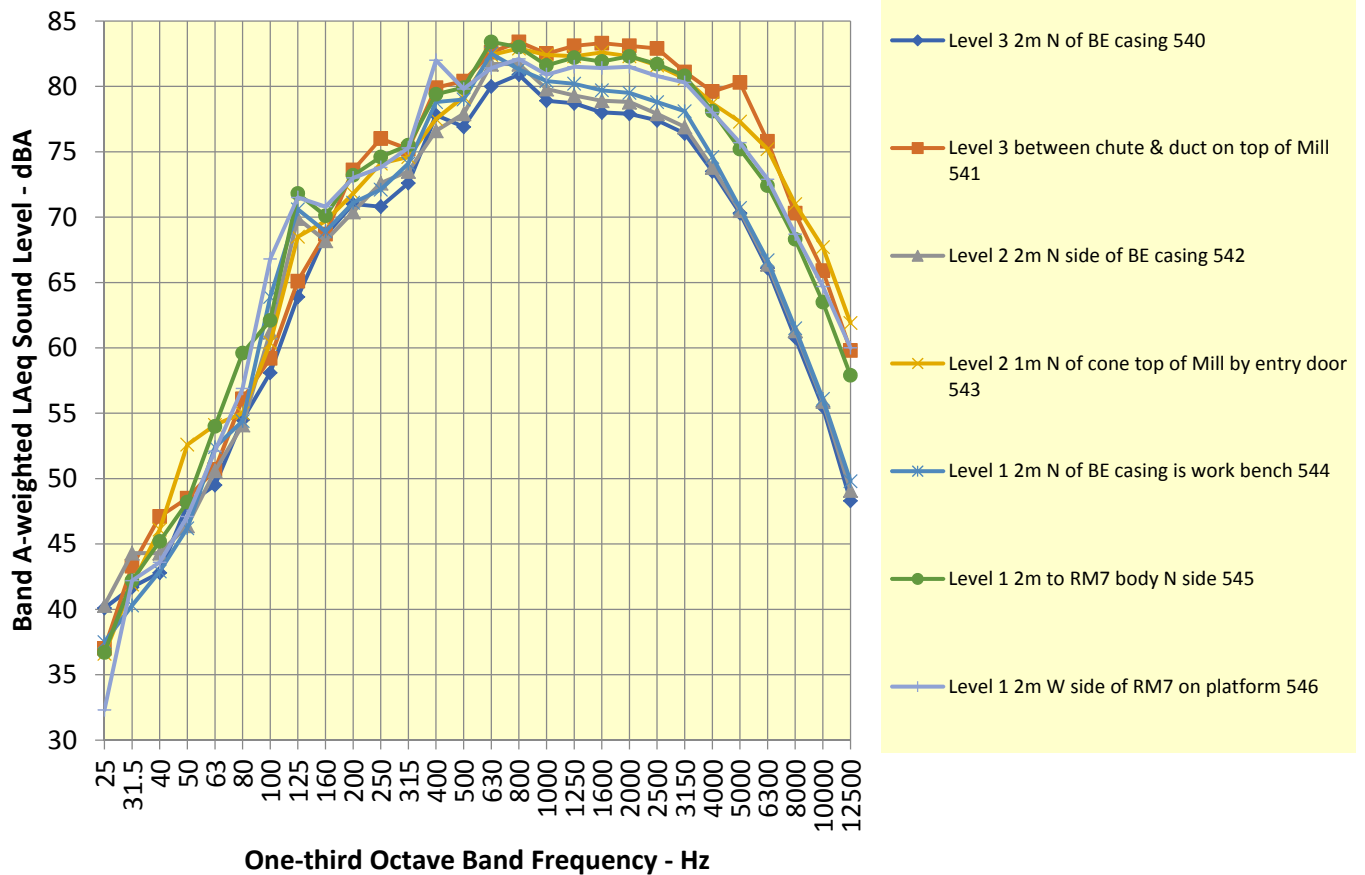


**Figure A27B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Inside Levels 1 to 3**

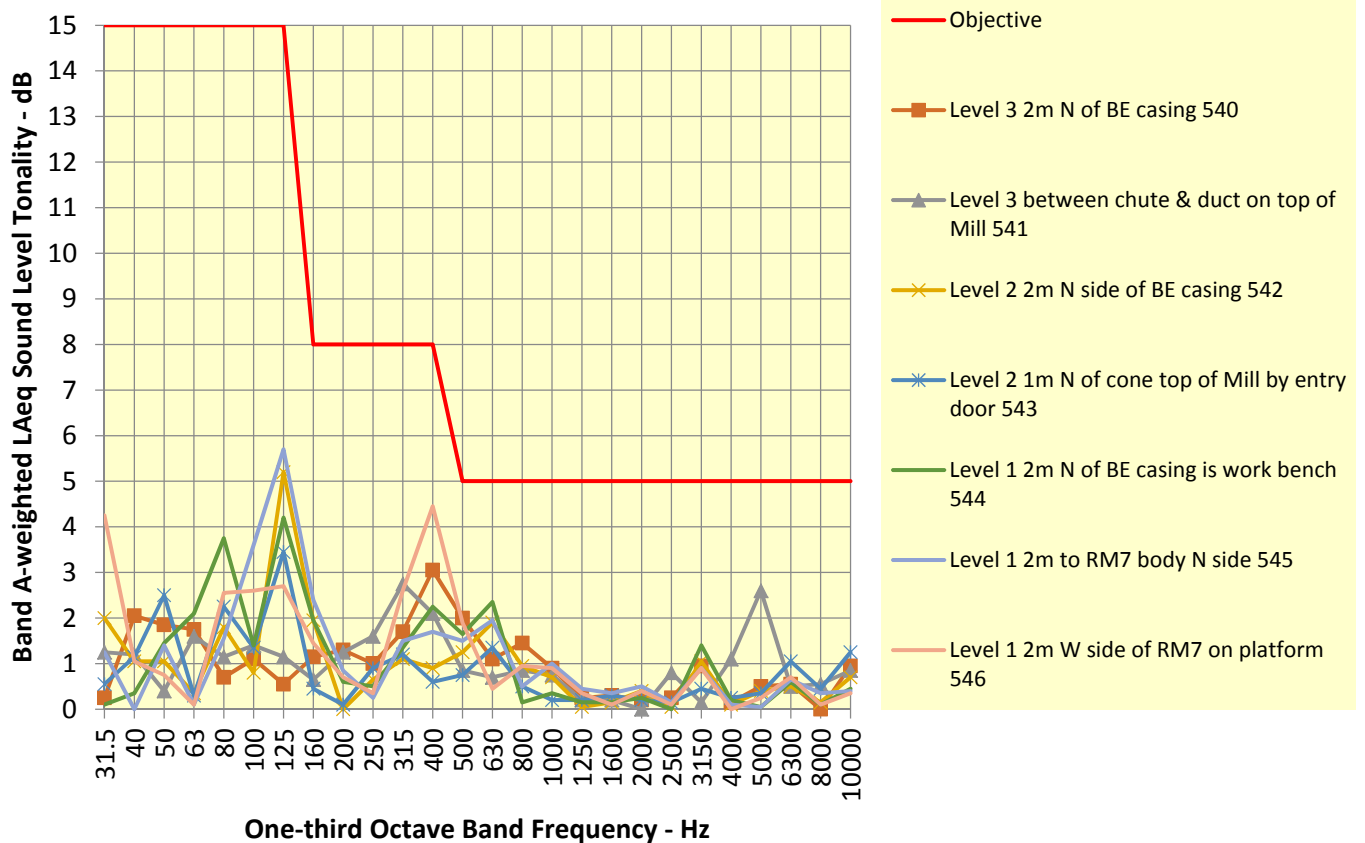


**Figure A28A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Inside Level 0**

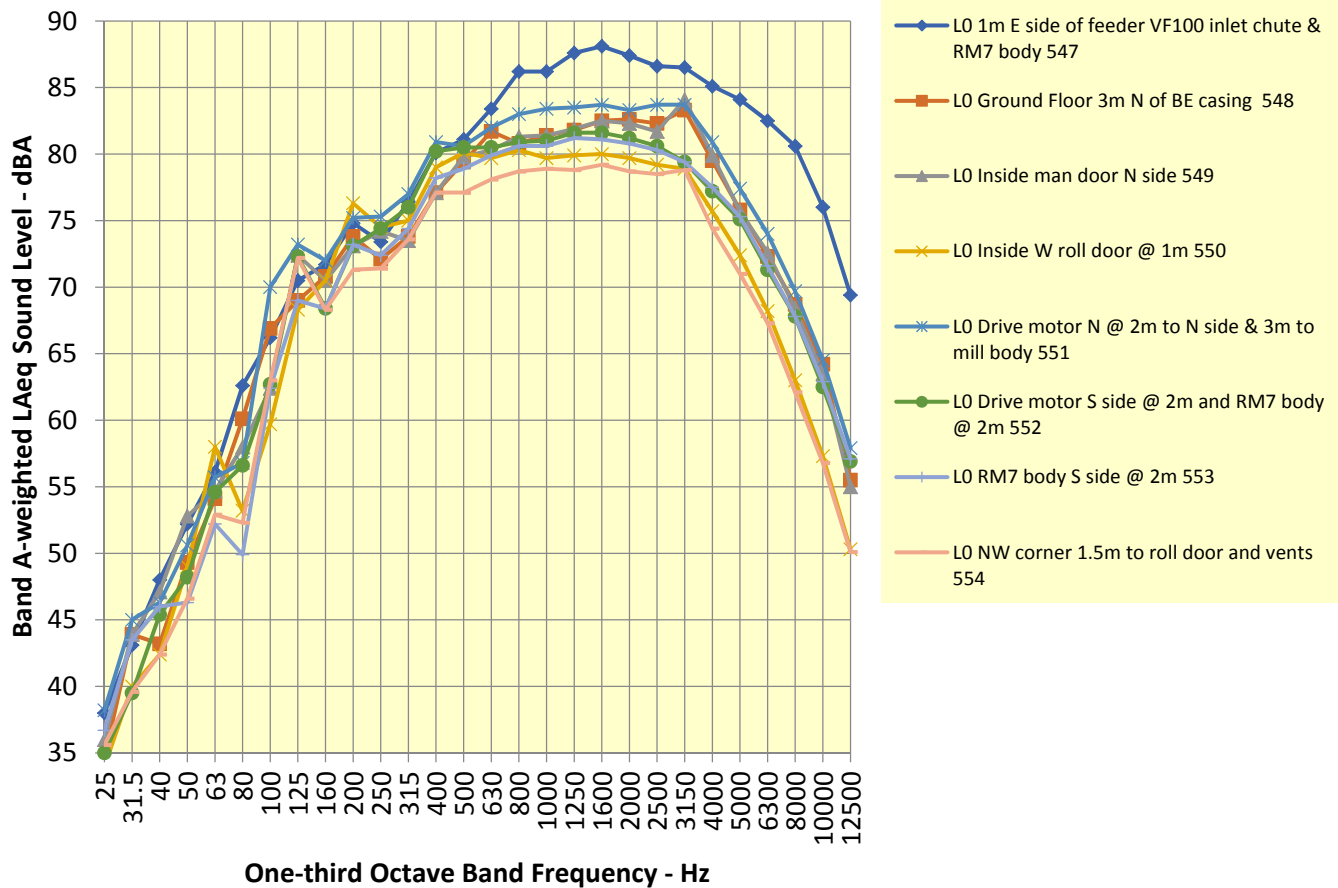


**Figure A28B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Inside Level 0**

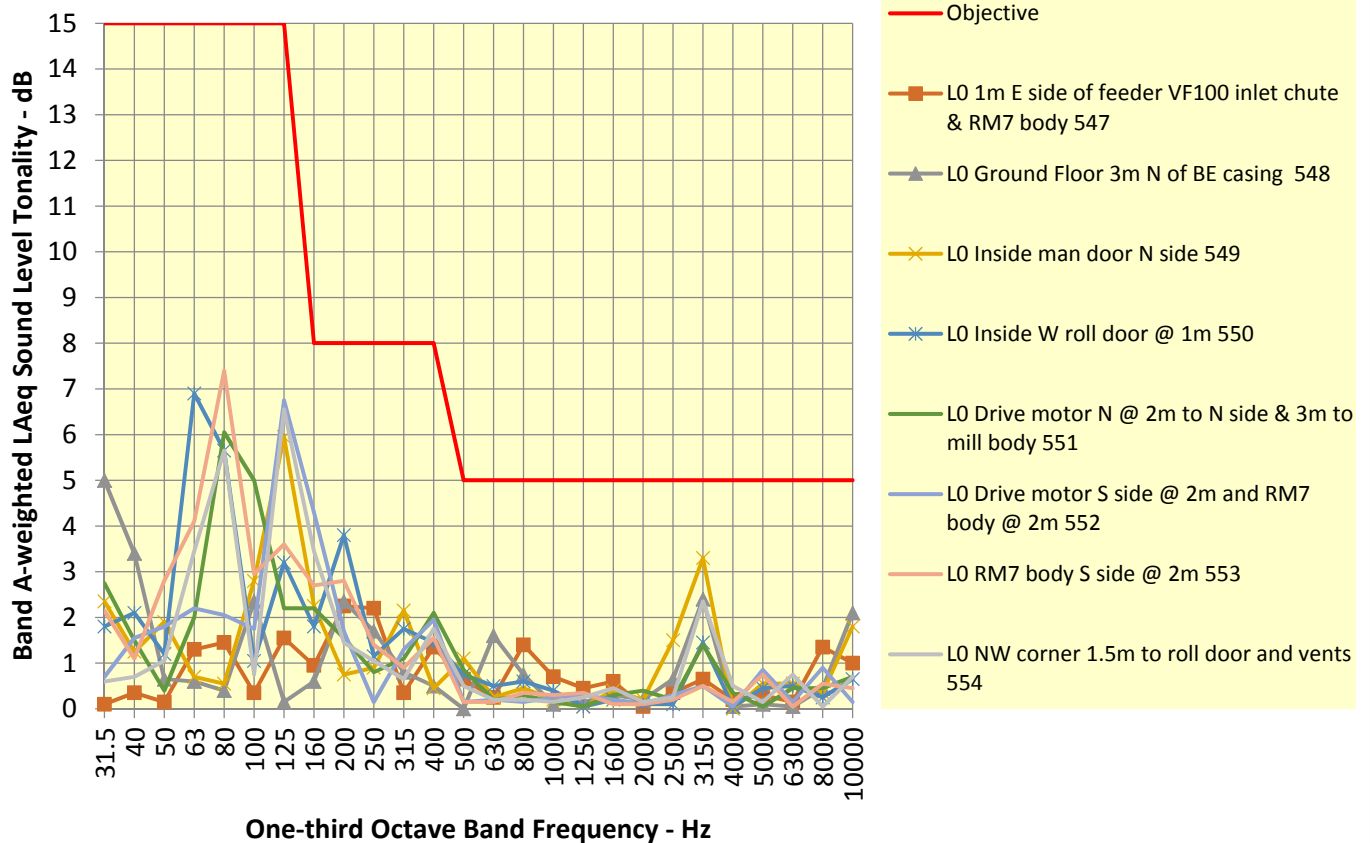


Figure A29A: Boral Cement Berrima Annual Noise 2019 Spectra
RM7 Baghouse Hopper area

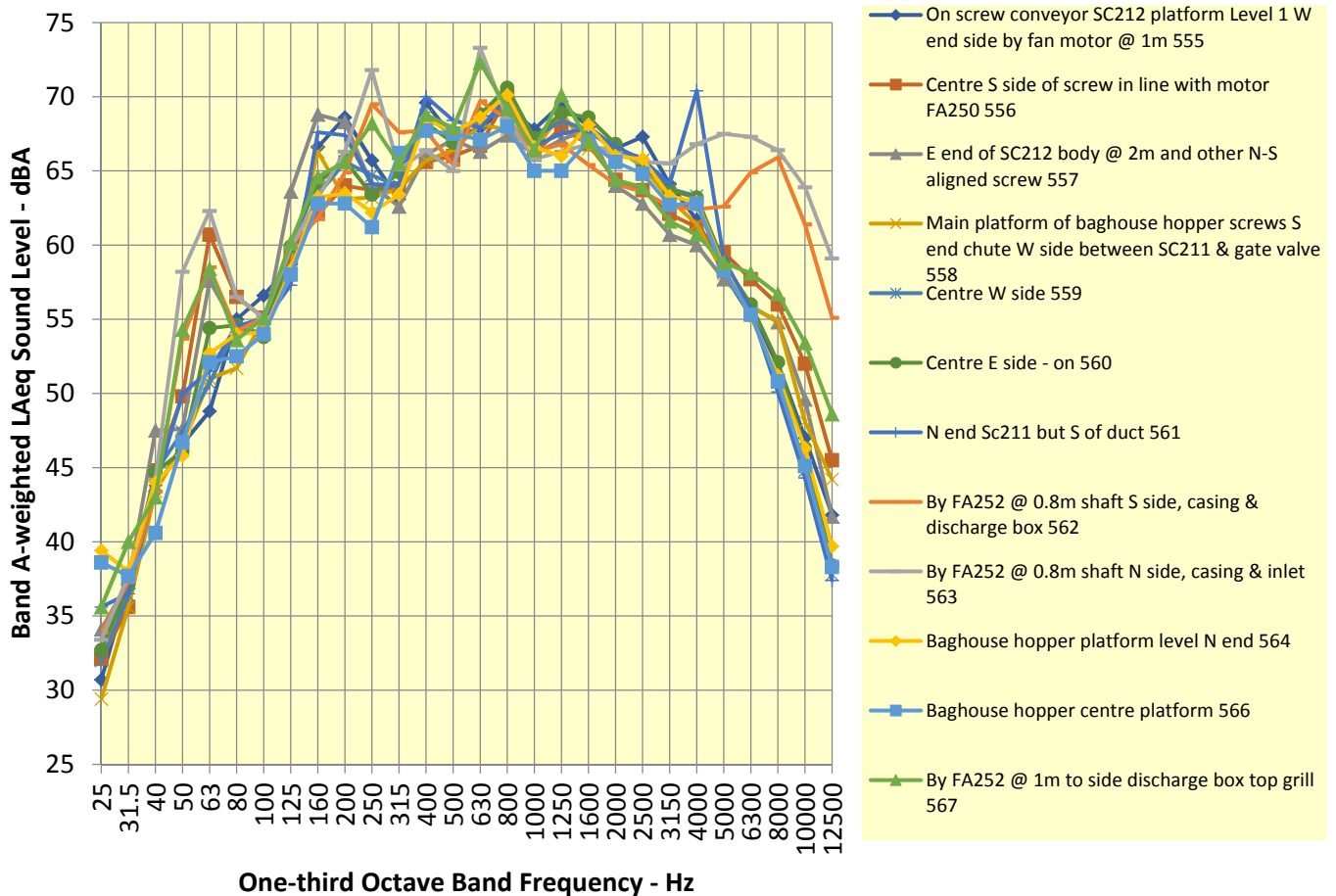


Figure A29B: Boral Cement Berrima Annual Noise 2019 Tonality
RM7 Baghouse hopper area

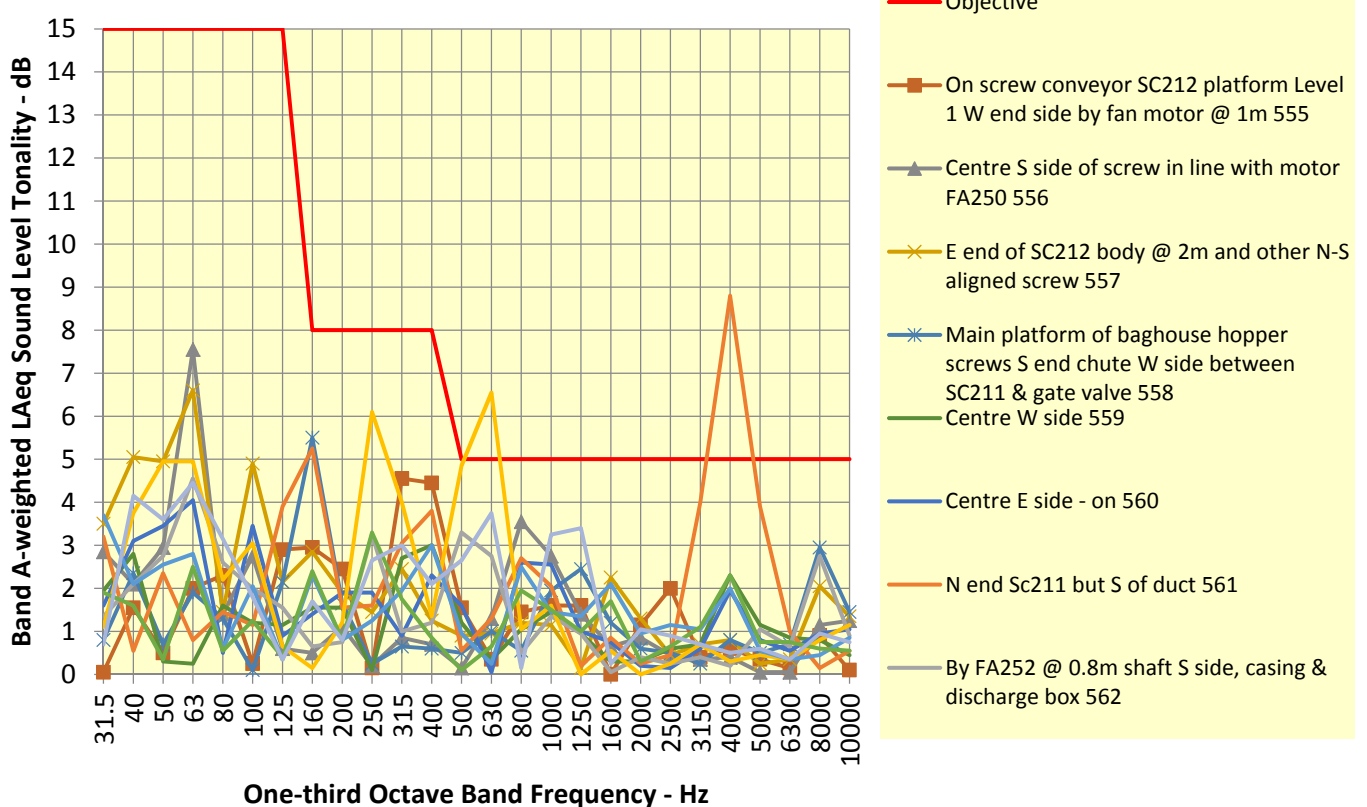


Figure A30A: Boral Cement Berrima Annual Noise 2019 Spectra
Coal Road South Side opposite RM7

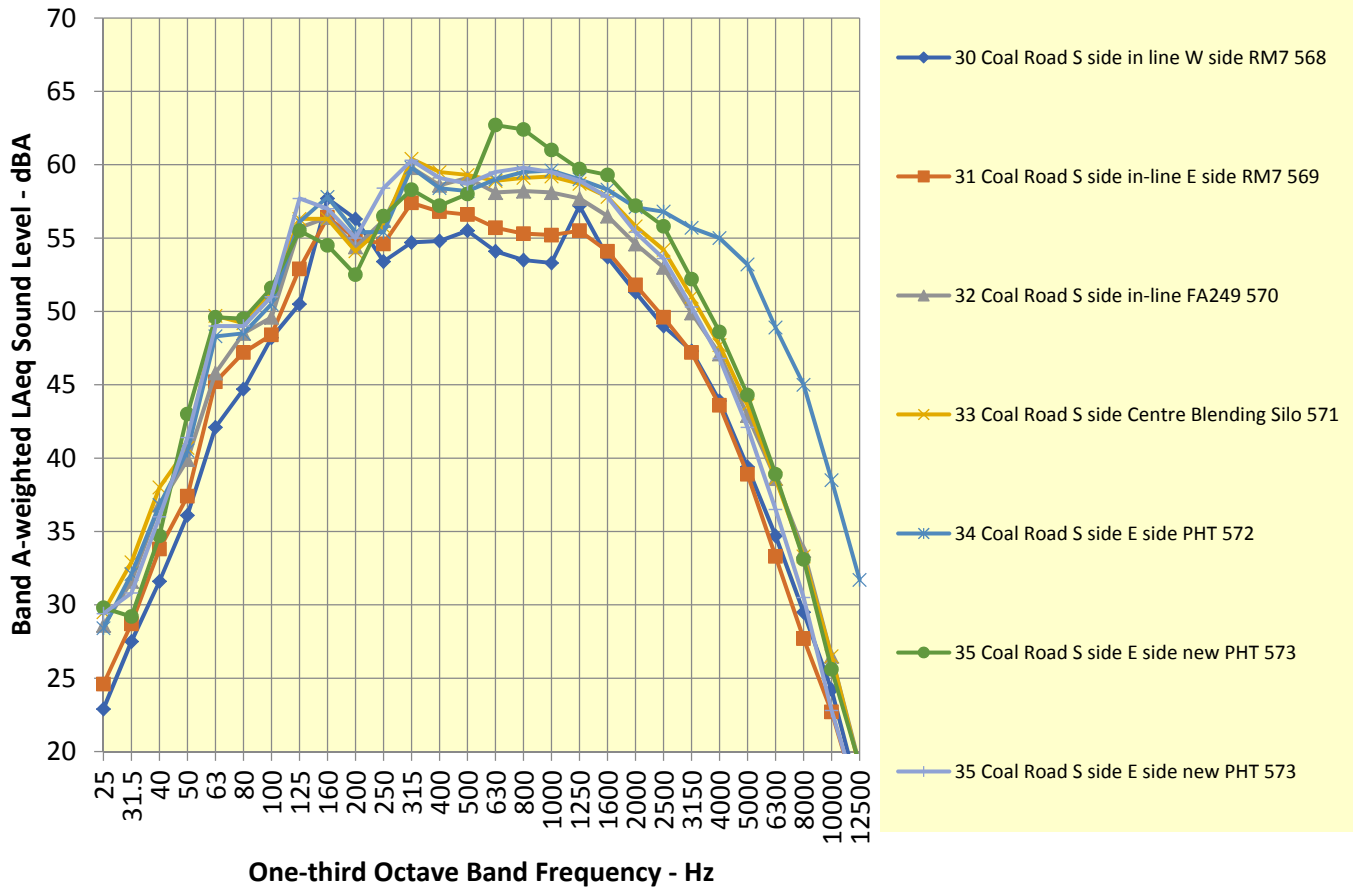


Figure A30B: Boral Cement Berrima Annual Noise 2019 Tonality
Coal Road South side opposite RM7

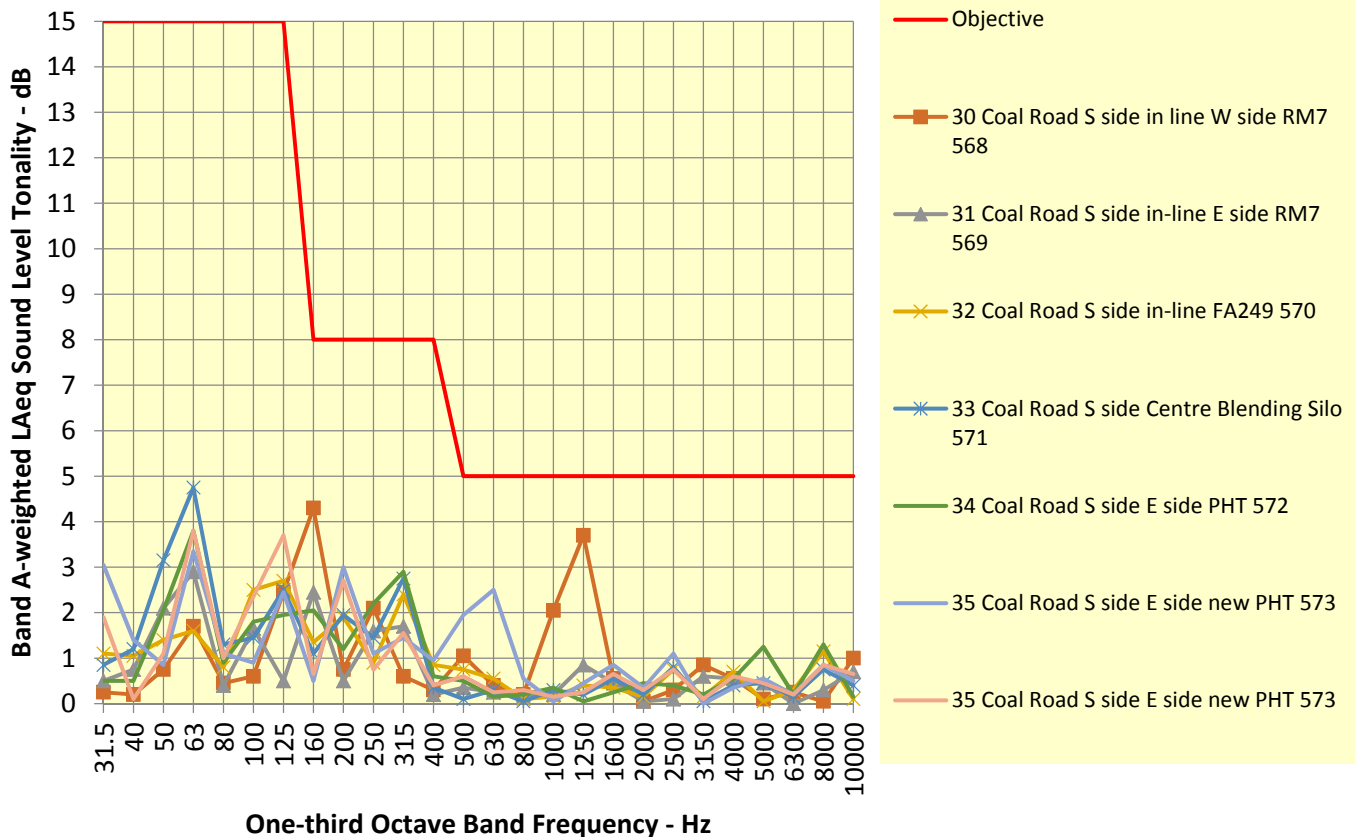


Figure A31A: Boral Cement Berrima Annual Noise 2019 Spectra
Coal Road South Side opposite Kiln

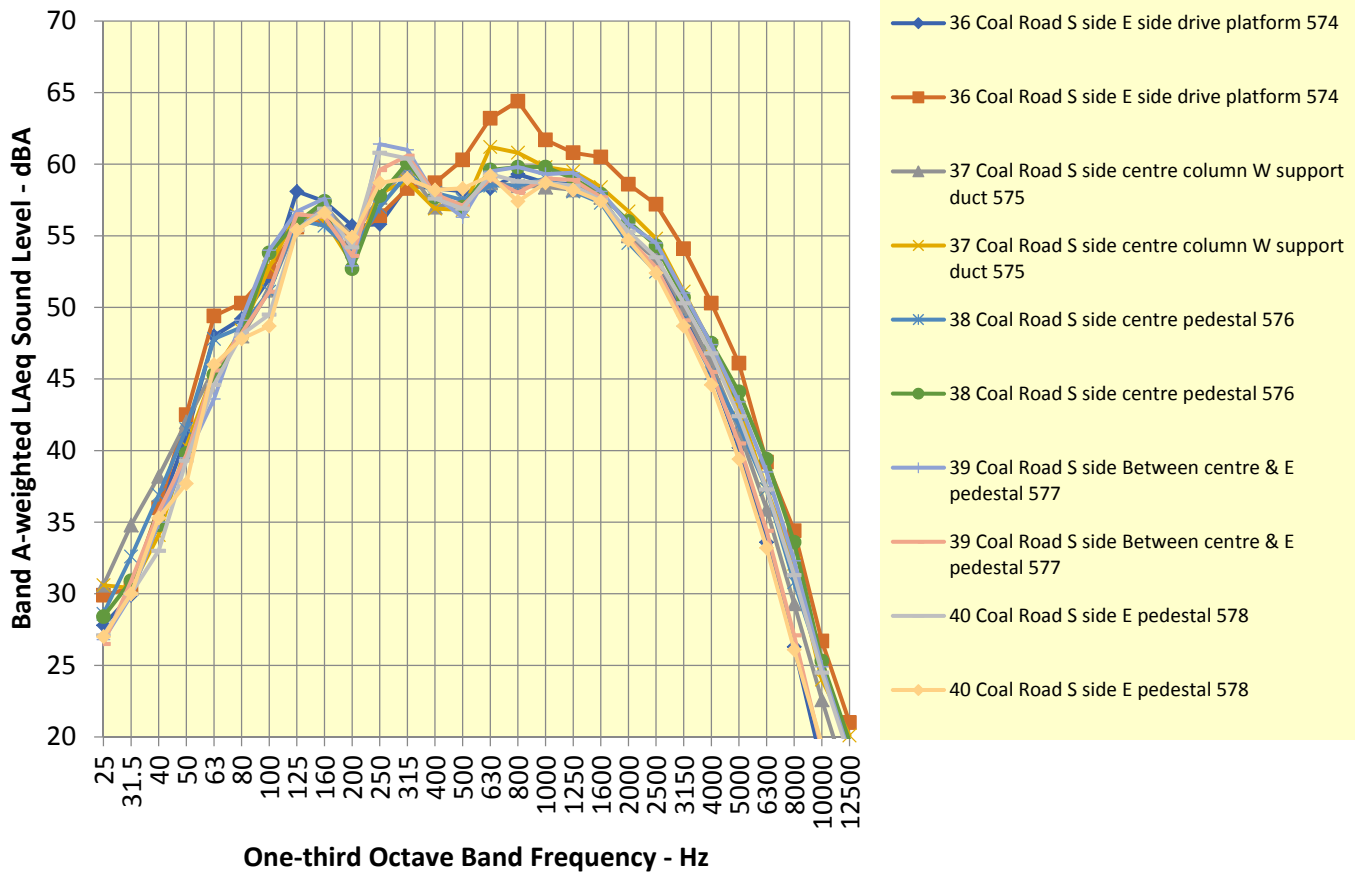


Figure A31B: Boral Cement Berrima Annual Noise 2019 Tonality
Coal Road South side opposite Kiln

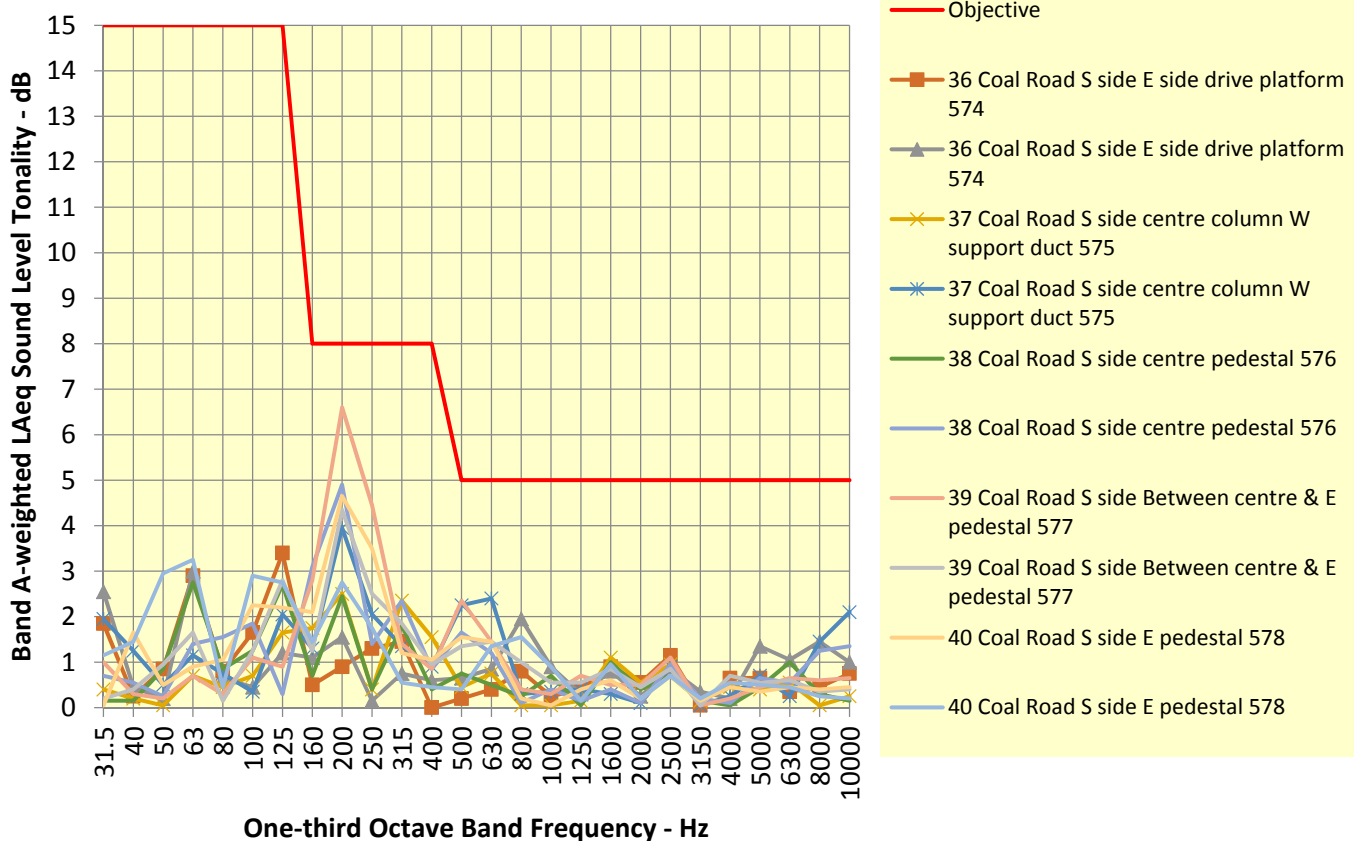


**Figure A32A: Boral Cement Berrima Annual Noise 2019 Spectra
Coal Road South Side opposite Coal Mill**

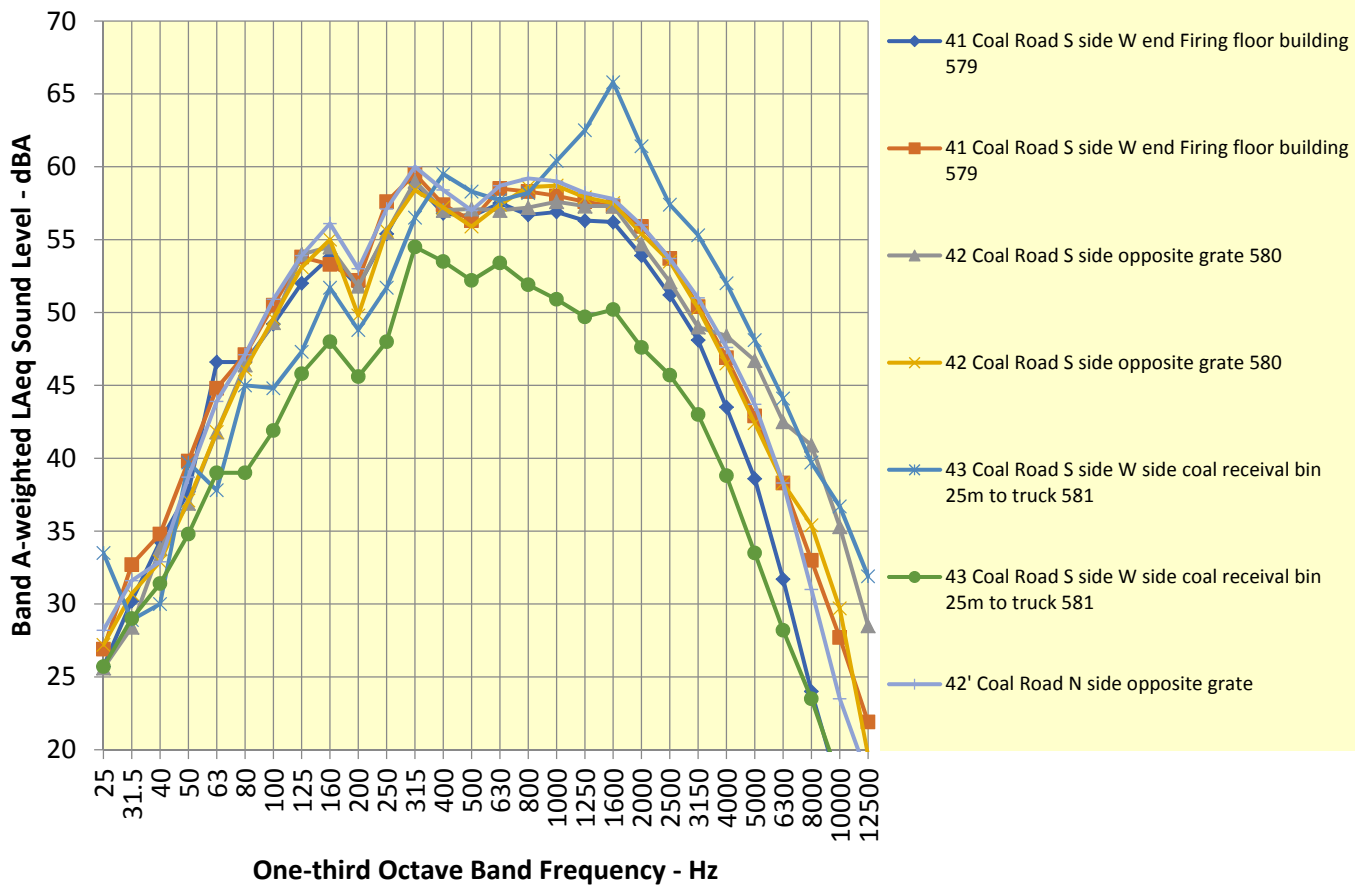


**Figure A32B: Boral Cement Berrima Annual Noise 2019 Tonality
Coal Road South side opposite Coal mill**

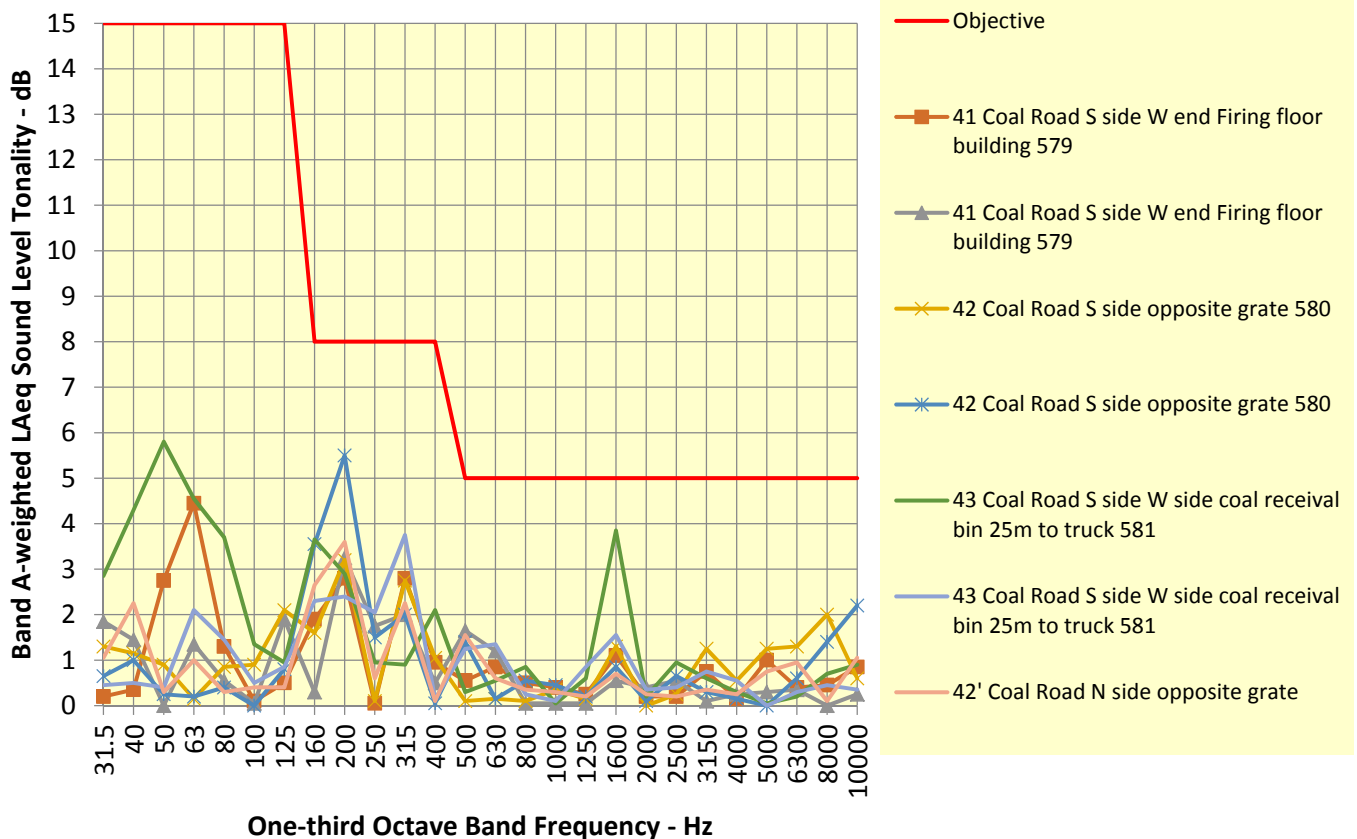


Figure A33A: Boral Cement Berrima Annual Noise 2019 Spectra
South Side of Coal Mill

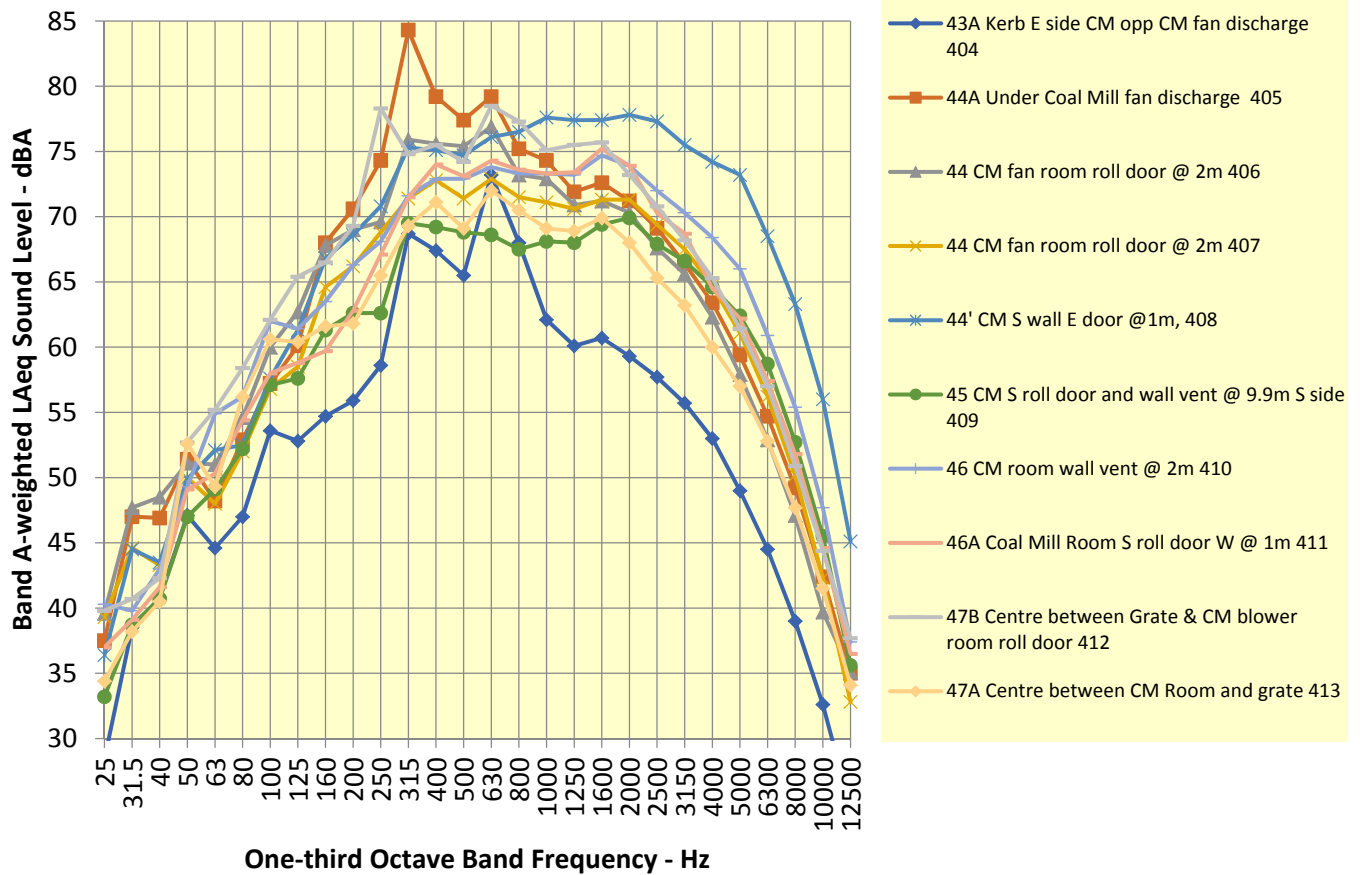


Figure A33B: Boral Cement Berrima Annual Noise 2019 Tonality
South side of Coal mill

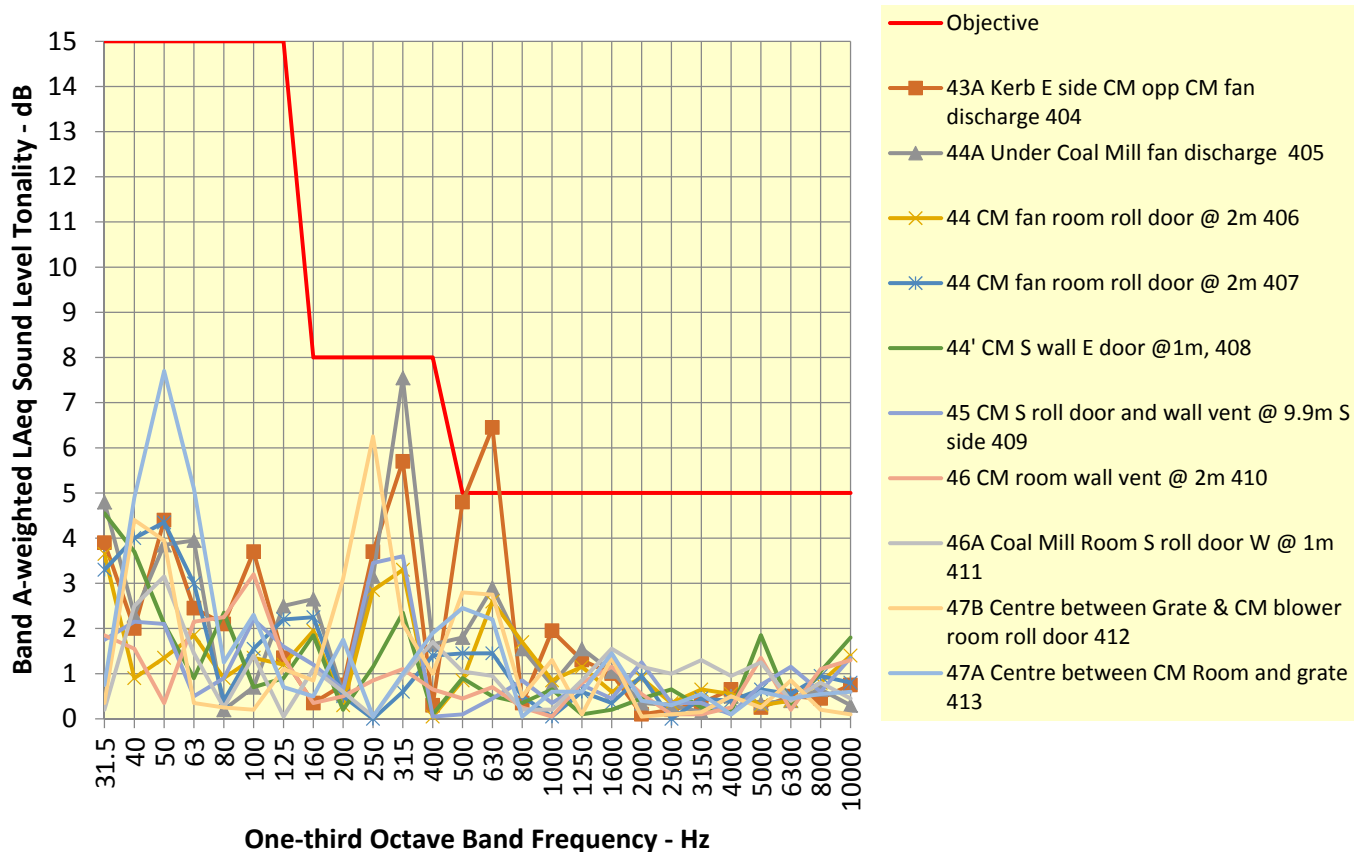


Figure A34A: Boral Cement Berrima Annual Noise 2019 Spectra
South Side of Kiln

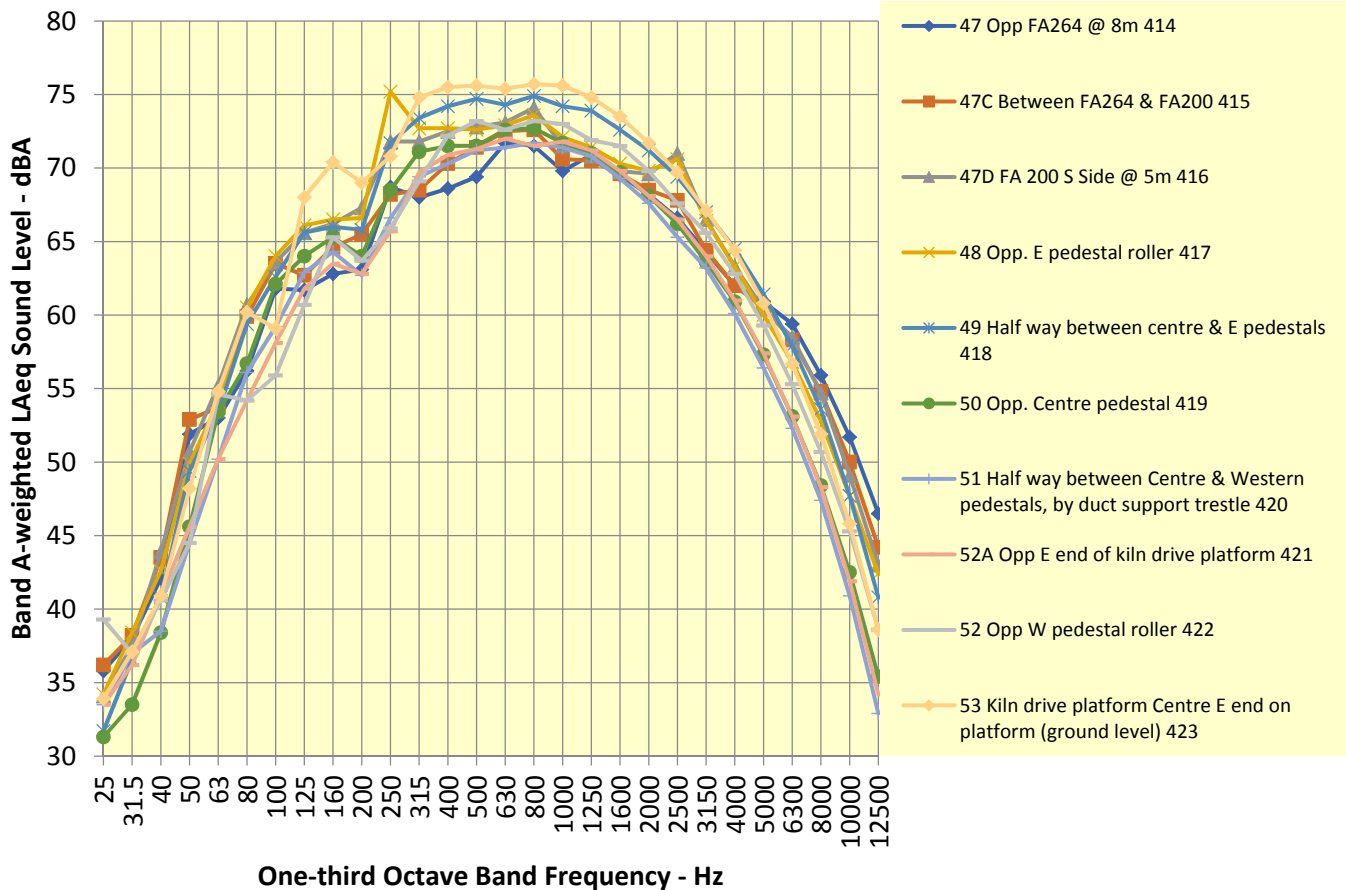


Figure A34B: Boral Cement Berrima Annual Noise 2019 Tonality
South side of Kiln

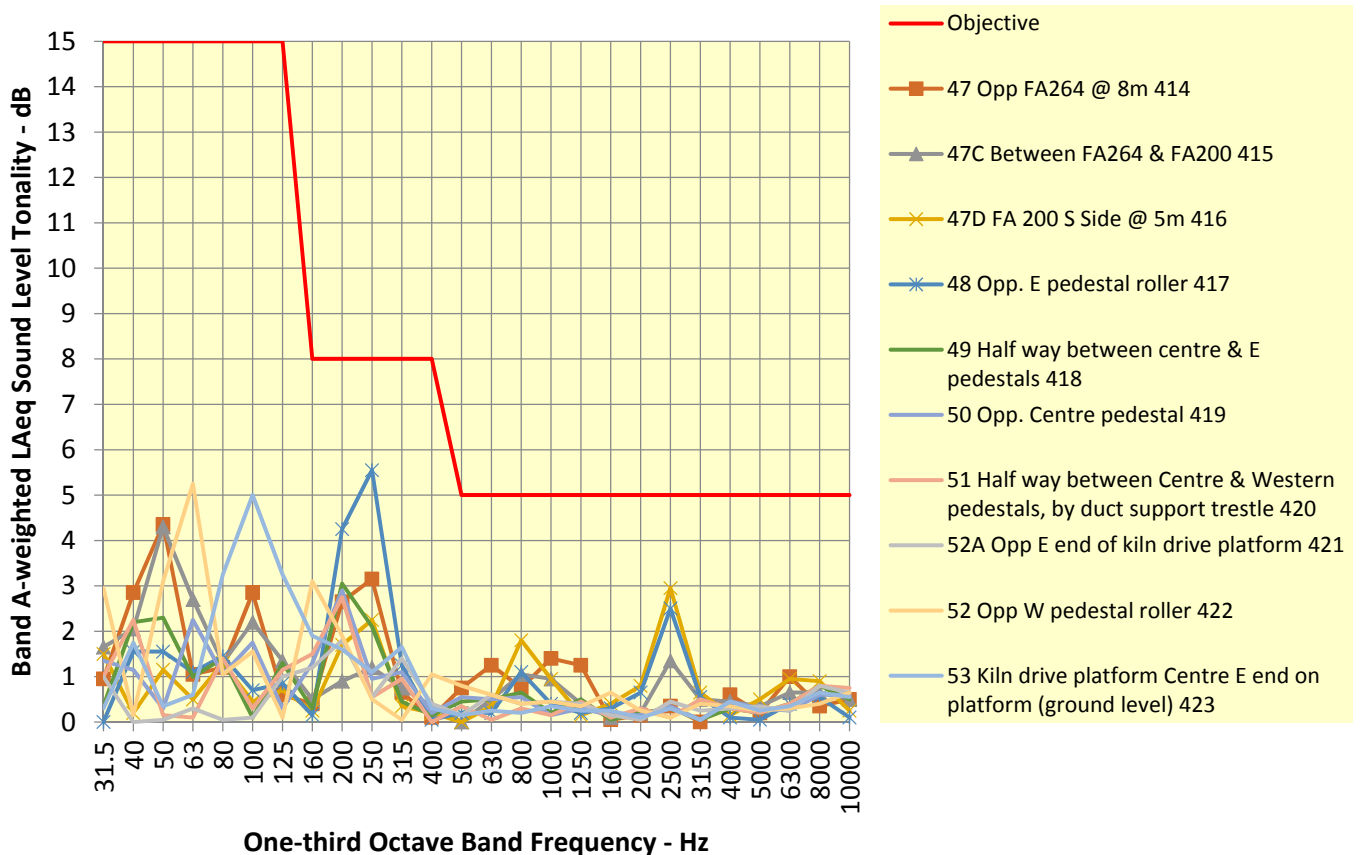


Figure A35A: Boral Cement Berrima Annual Noise 2019 Spectra
Kiln Drive Platform

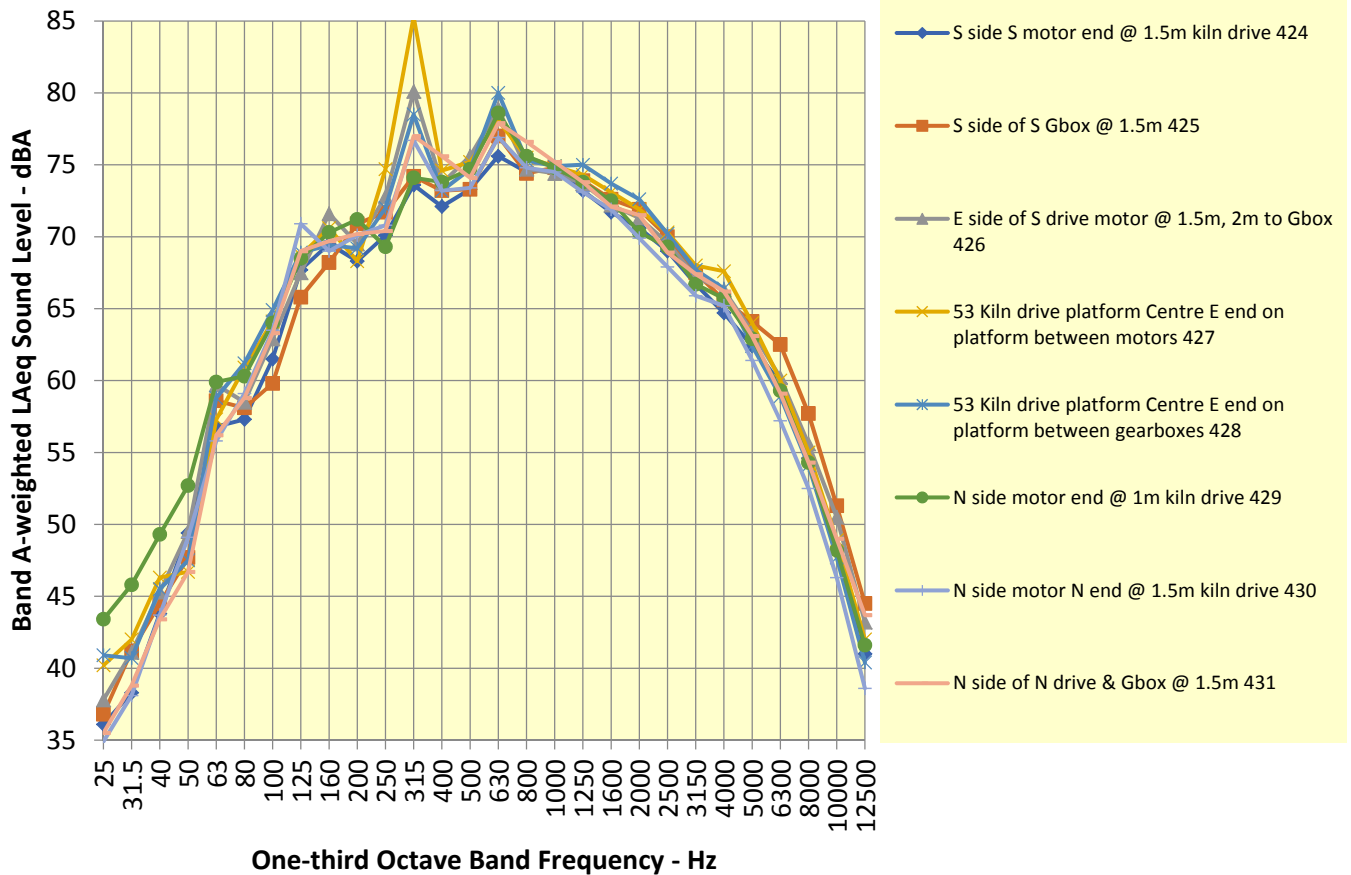


Figure A35B: Boral Cement Berrima Annual Noise 2019 Tonality
Kiln Drive Platform

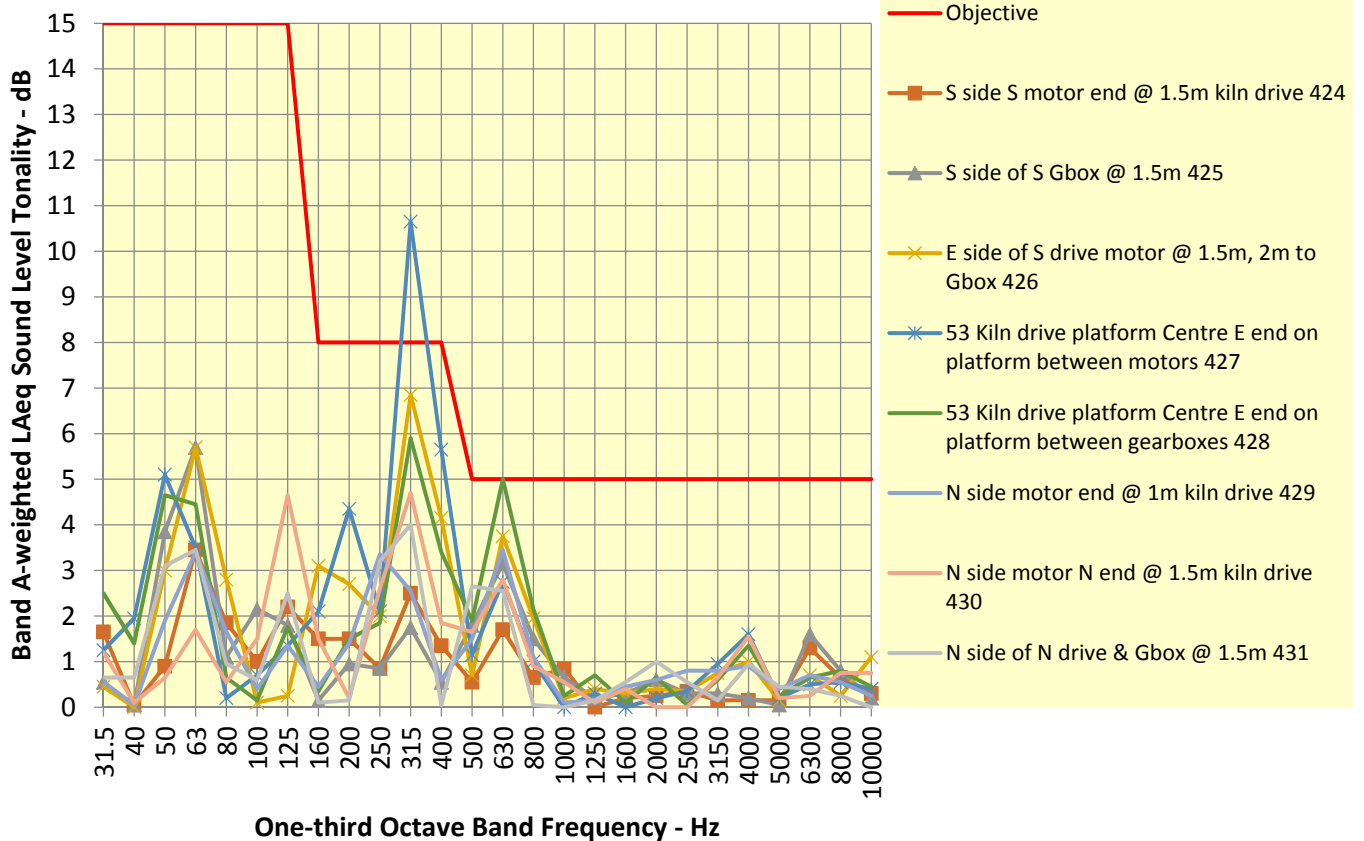


**Figure A36A: Boral Cement Berrima Annual Noise 2019 Spectra
Fenceline South**

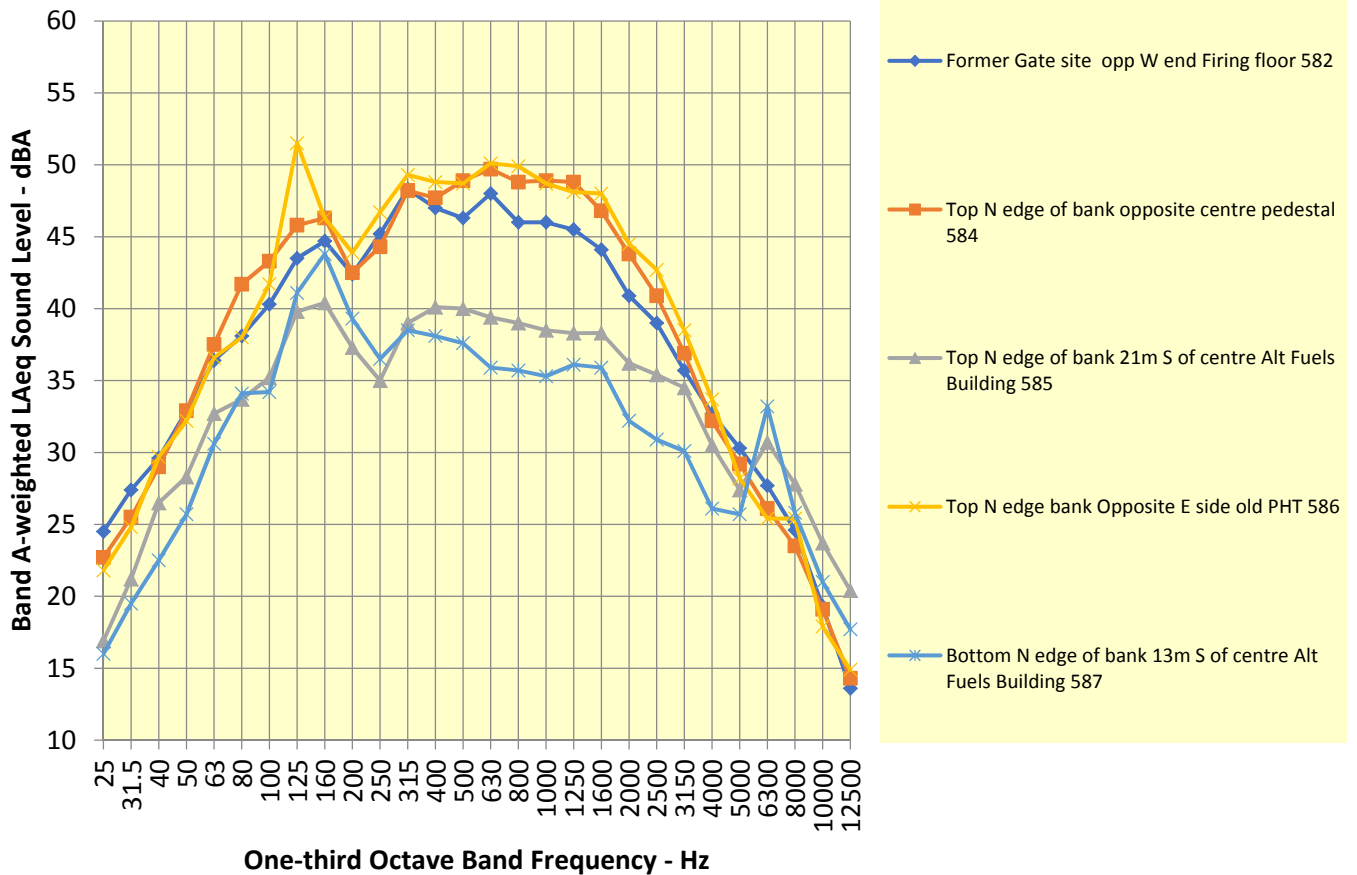


**Figure A36B: Boral Cement Berrima Annual Noise 2019 Tonality
Fenceline South**

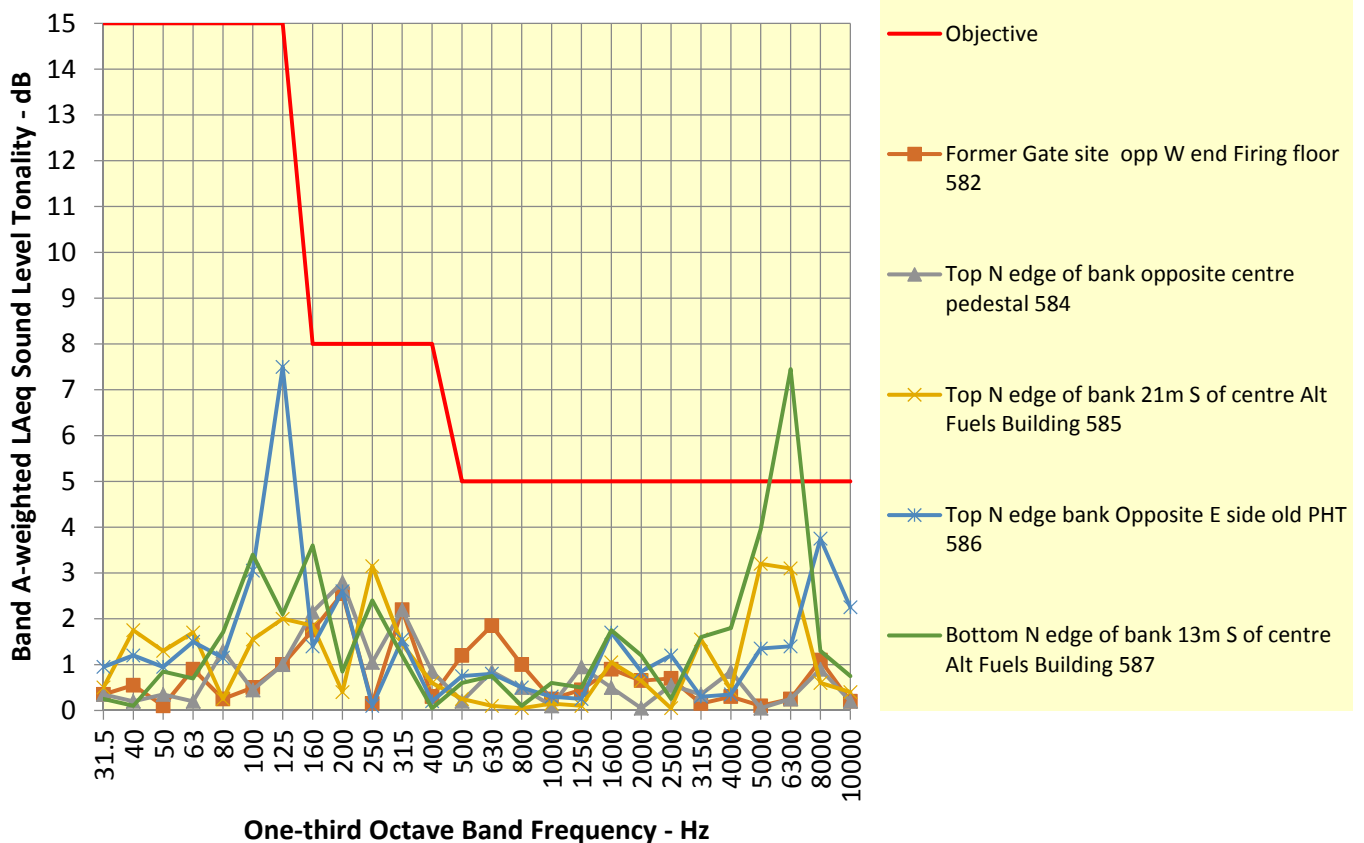


Figure A37A: Boral Cement Berrima Annual Noise 2019 Spectra
North side of RM6

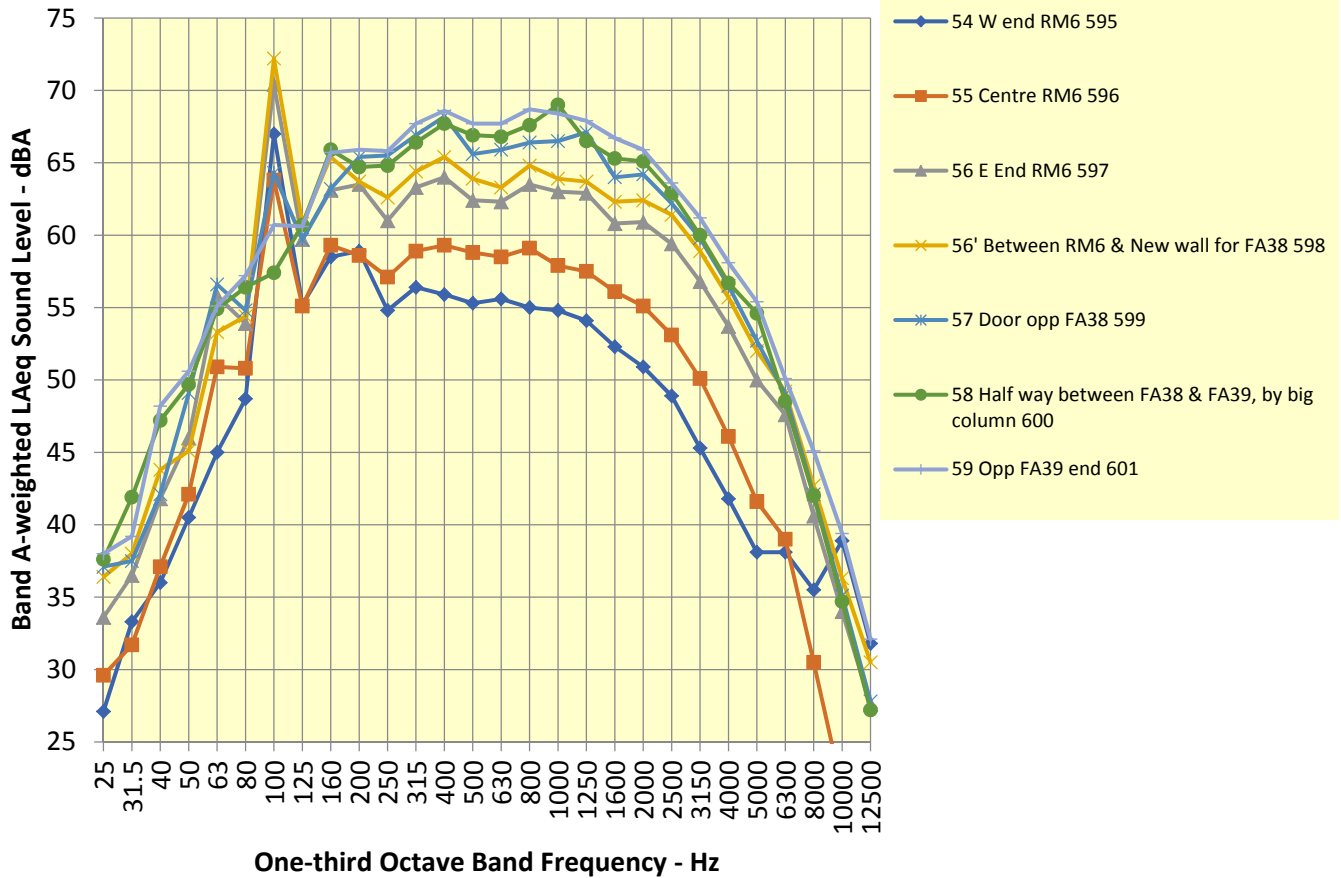


Figure A37B: Boral Cement Berrima Annual Noise 2019 Tonality
North side of RM6

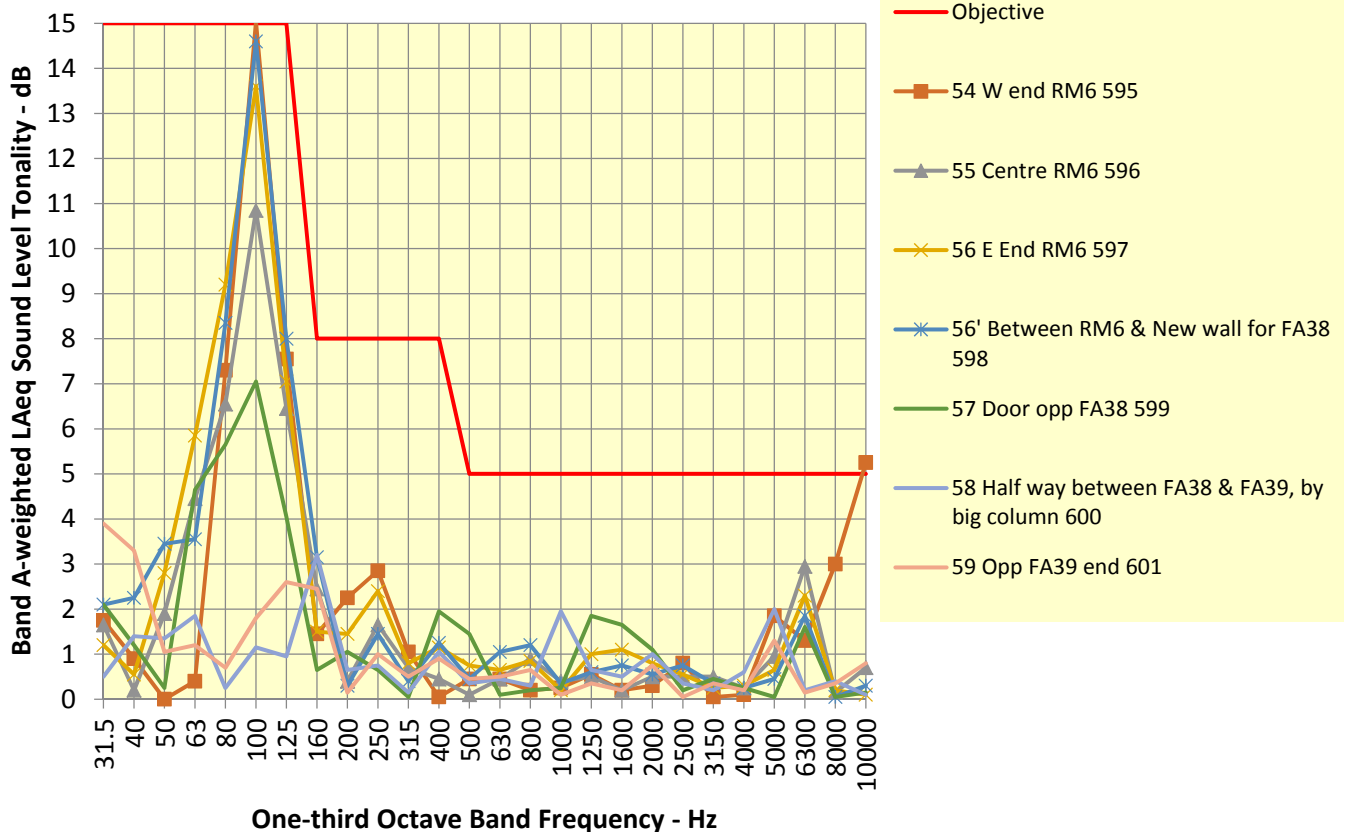


Figure A38A: Boral Cement Berrima Annual Noise 2019 Spectra
North side of Kiln 6

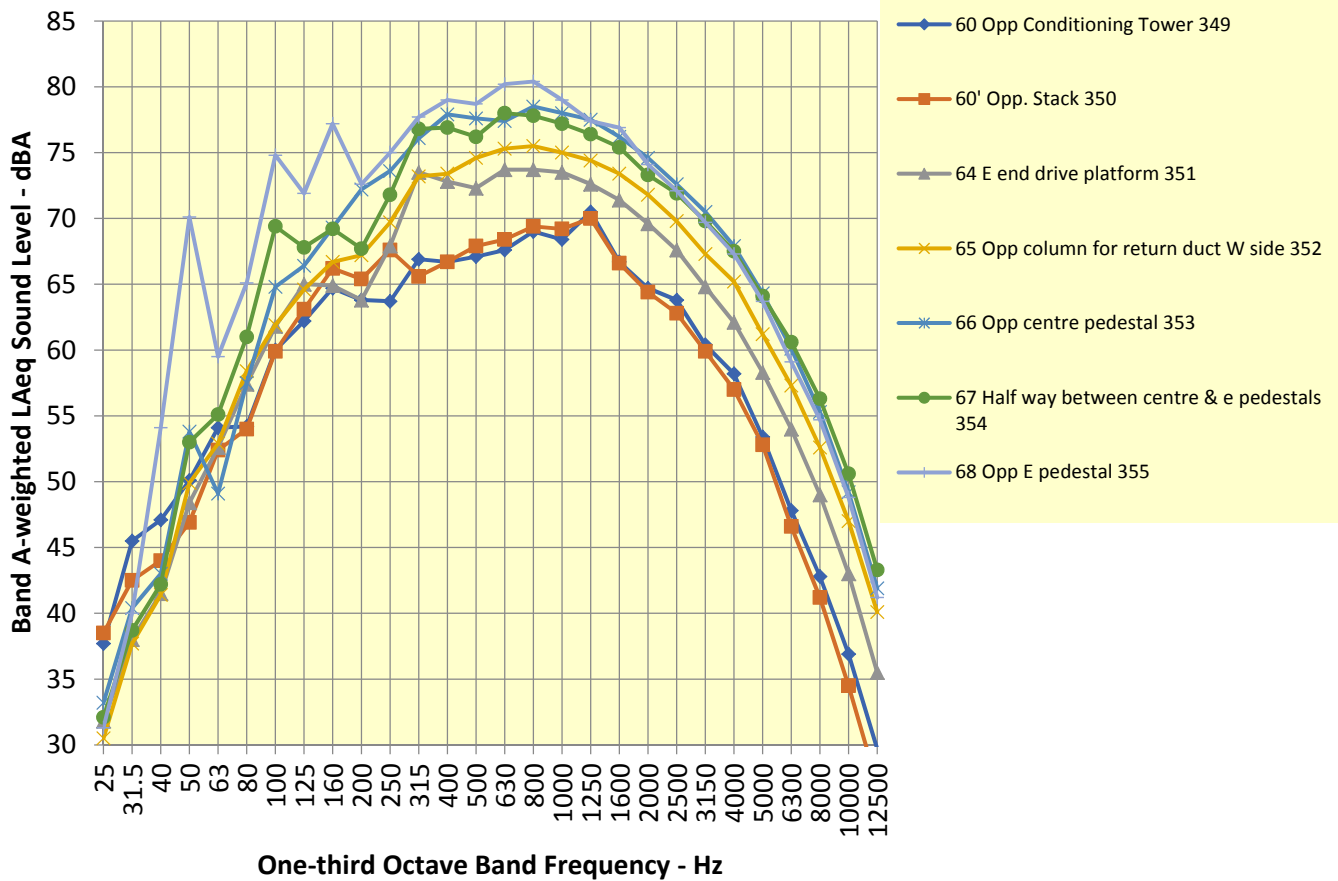


Figure A38B: Boral Cement Berrima Annual Noise 2019 Tonality
North side of Kiln 6

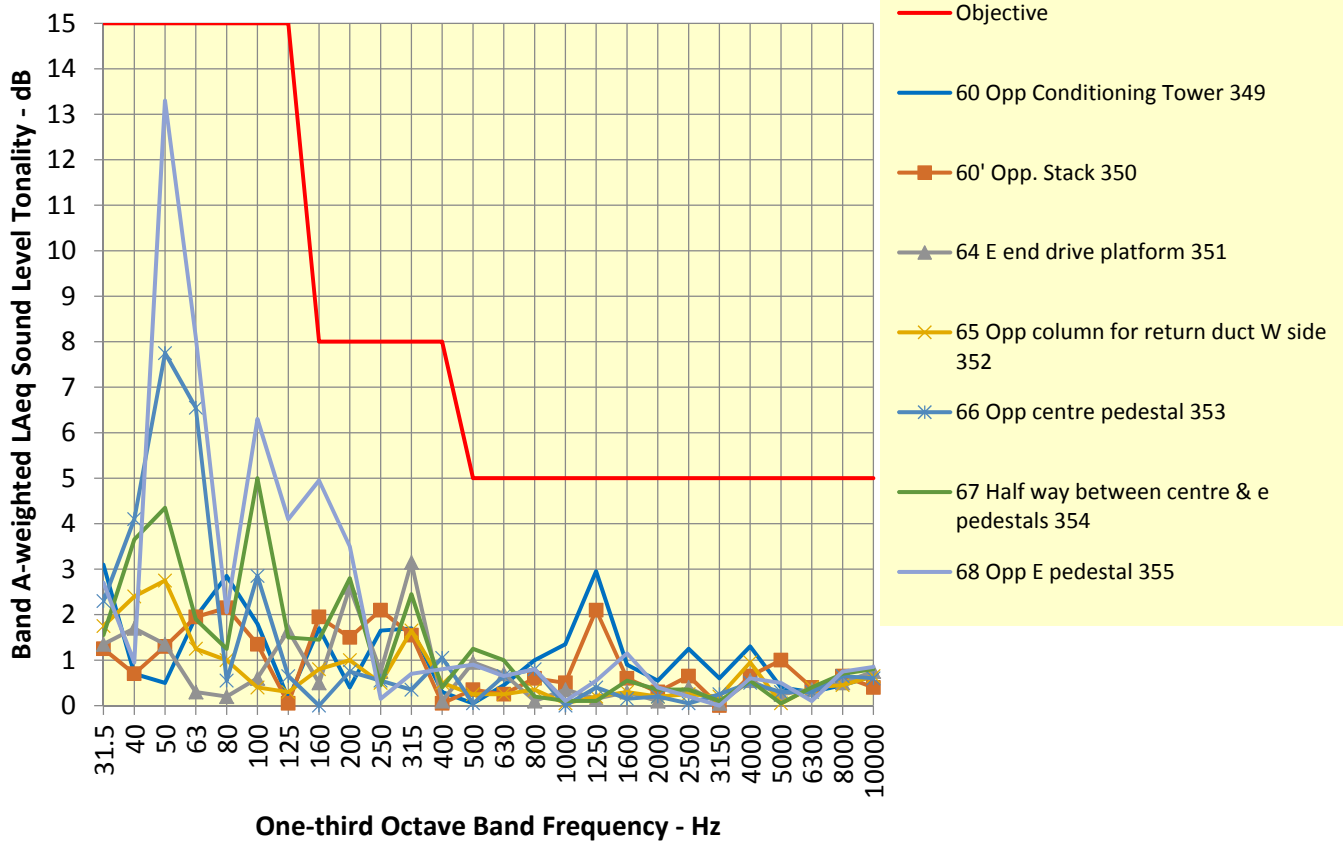


Figure A39A: Boral Cement Berrima Annual Noise 2019 Spectra
Grate Coller fan courtyard

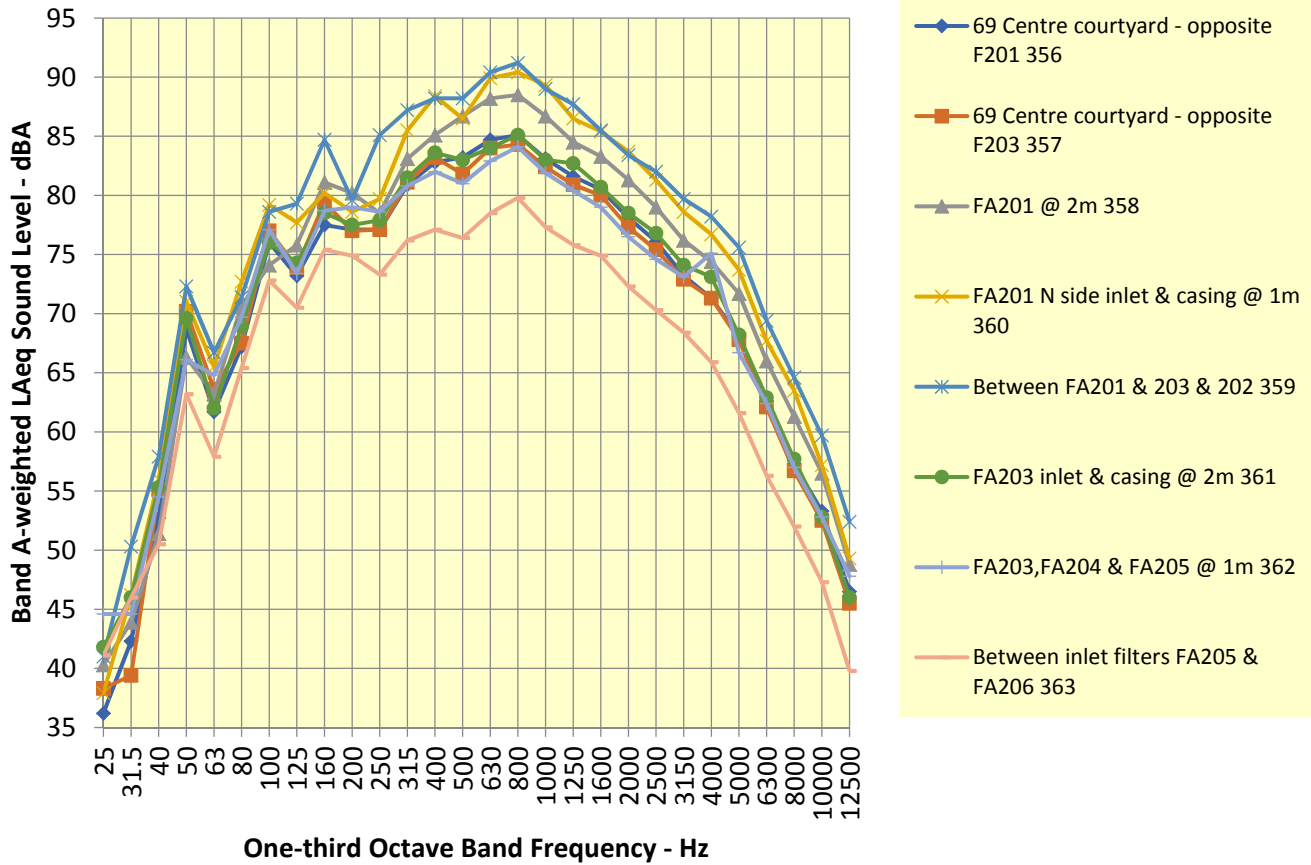


Figure A39B: Boral Cement Berrima Annual Noise 2019 Tonality
Grate Cooler Fan courtyard

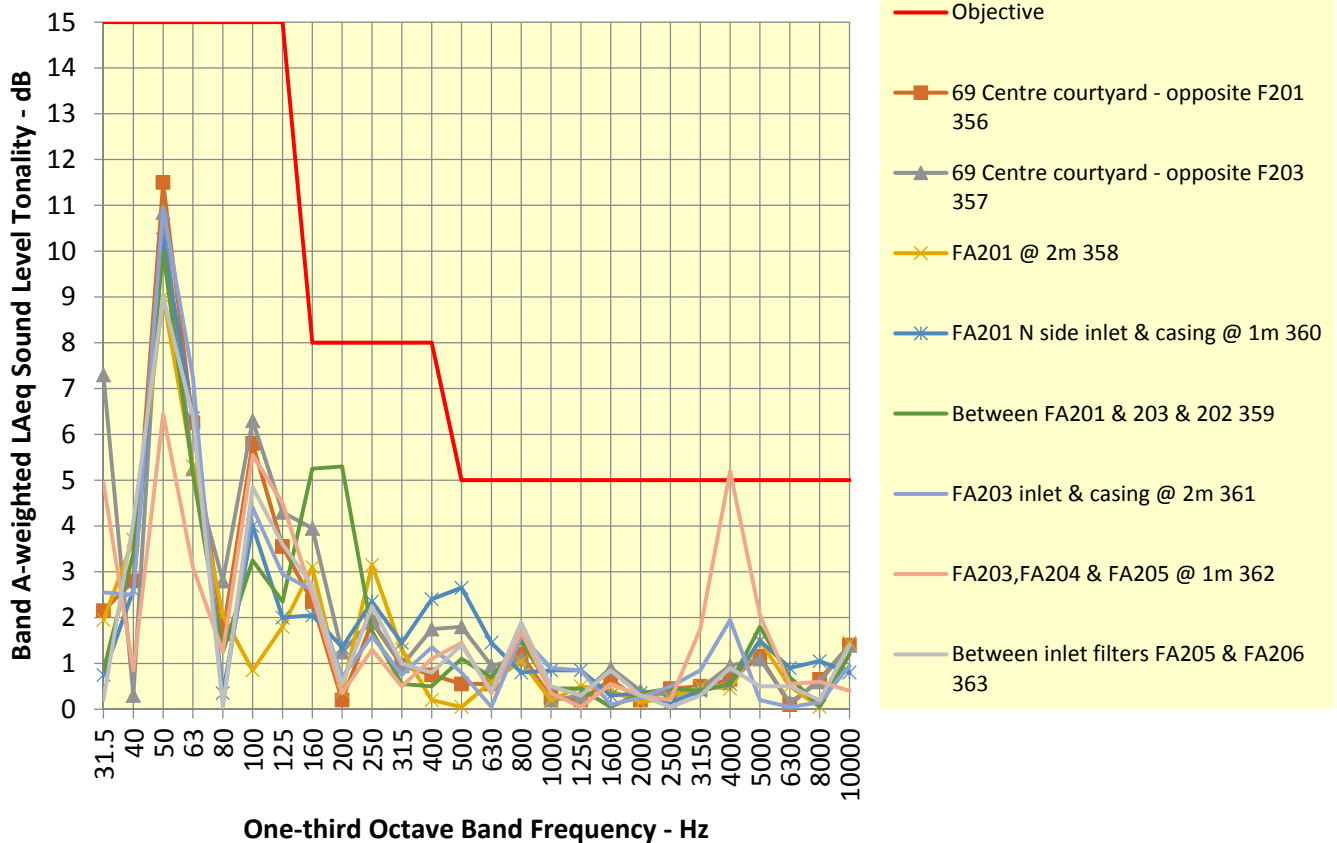


Figure A40A: Boral Cement Berrima Annual Noise 2019 Spectra

Kiln Firing Floor

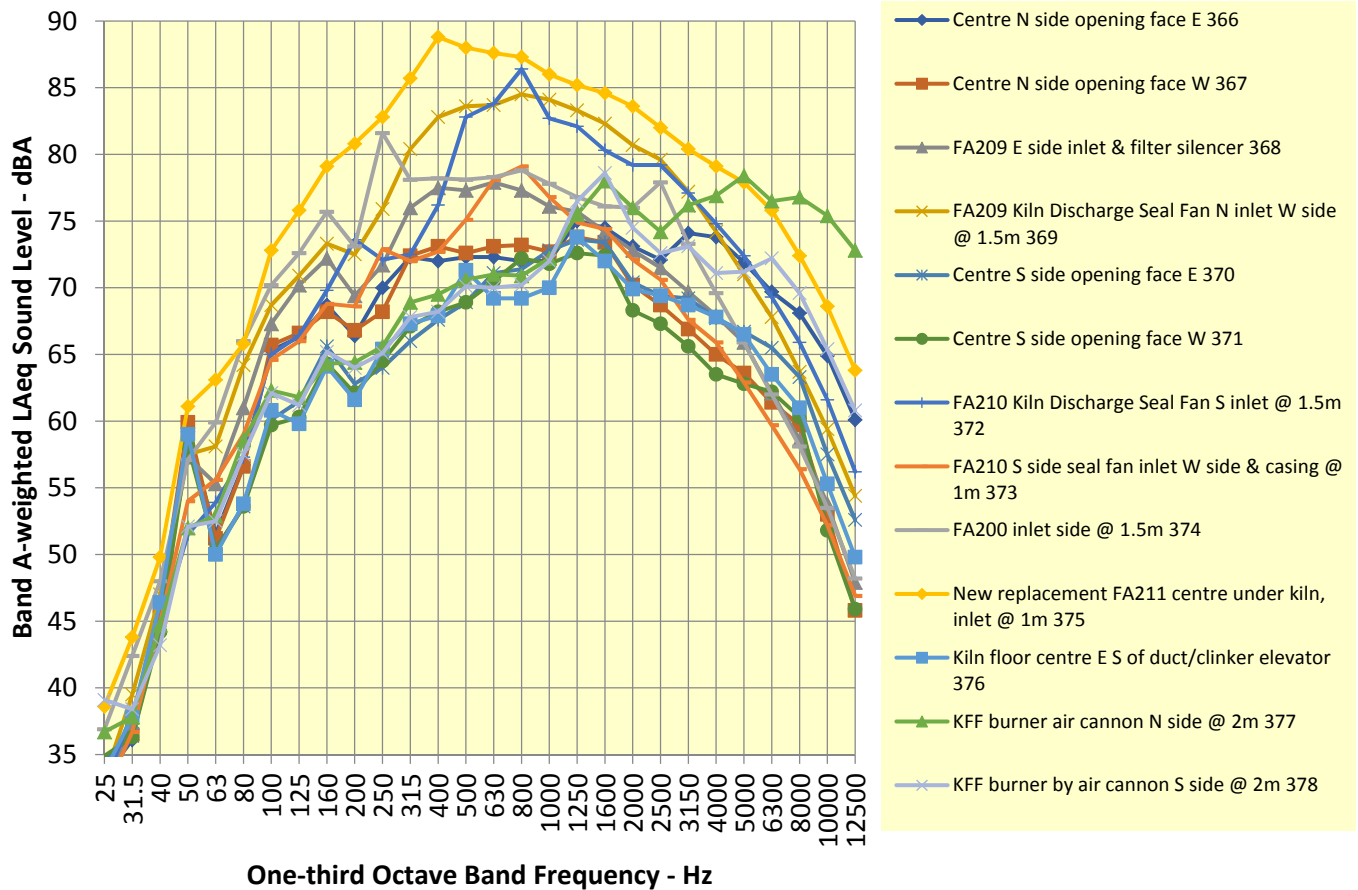


Figure A40B: Boral Cement Berrima Annual Noise 2019 Tonality

Kiln Firing floor

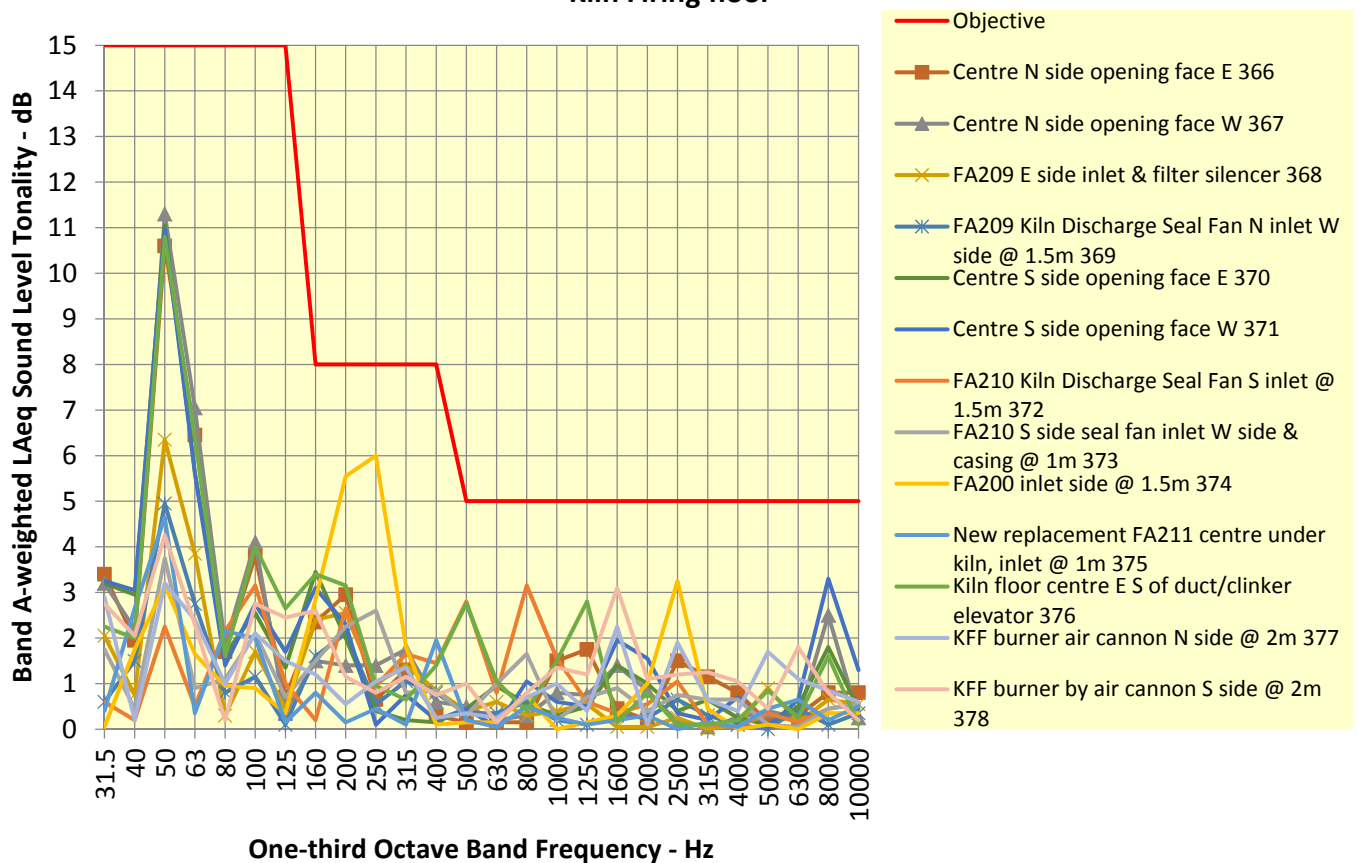


Figure A41A: Boral Cement Berrima Annual Noise 2019 Spectra
Northern side of grate area

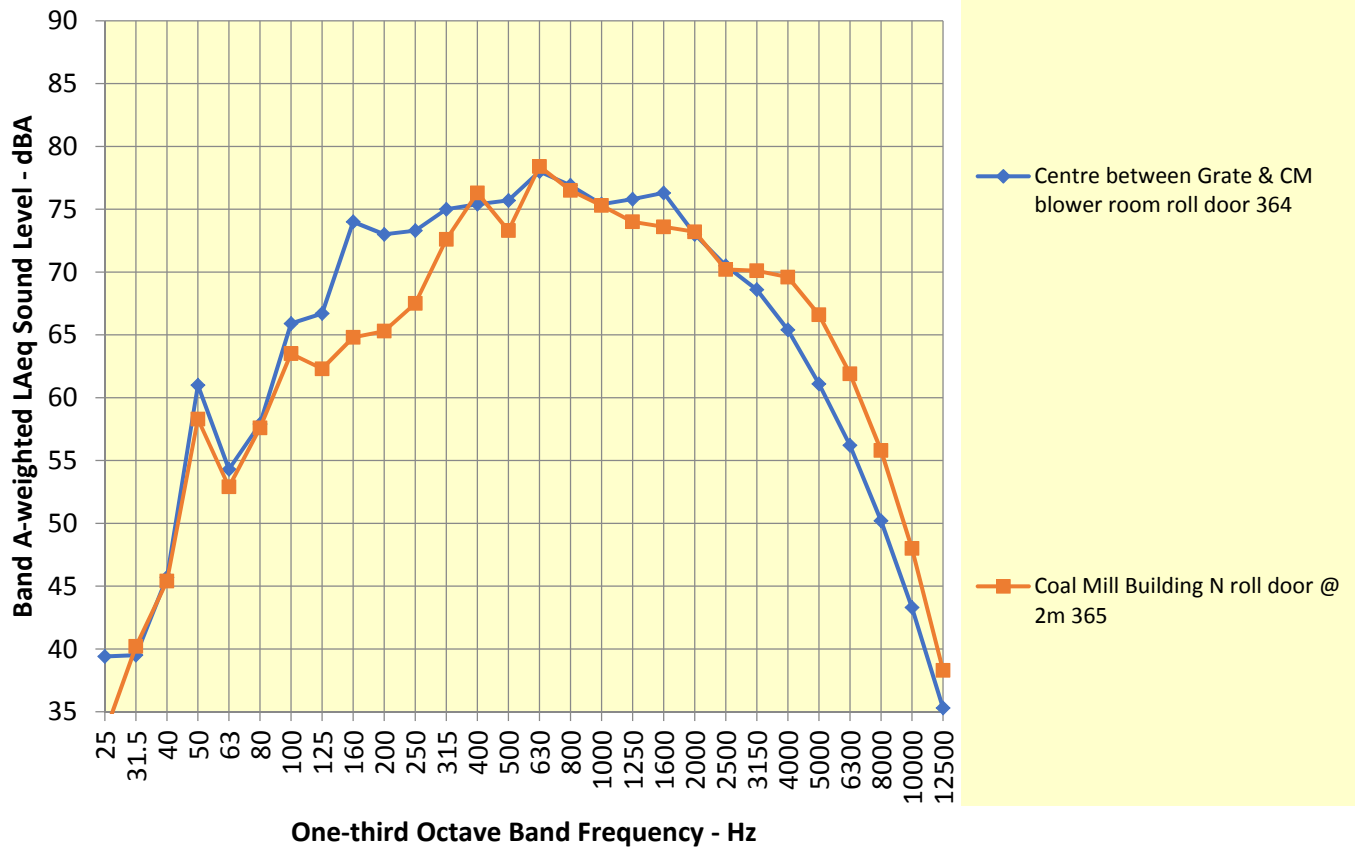


Figure A41B: Boral Cement Berrima Annual Noise 2019 Tonality
Northern side of grate area

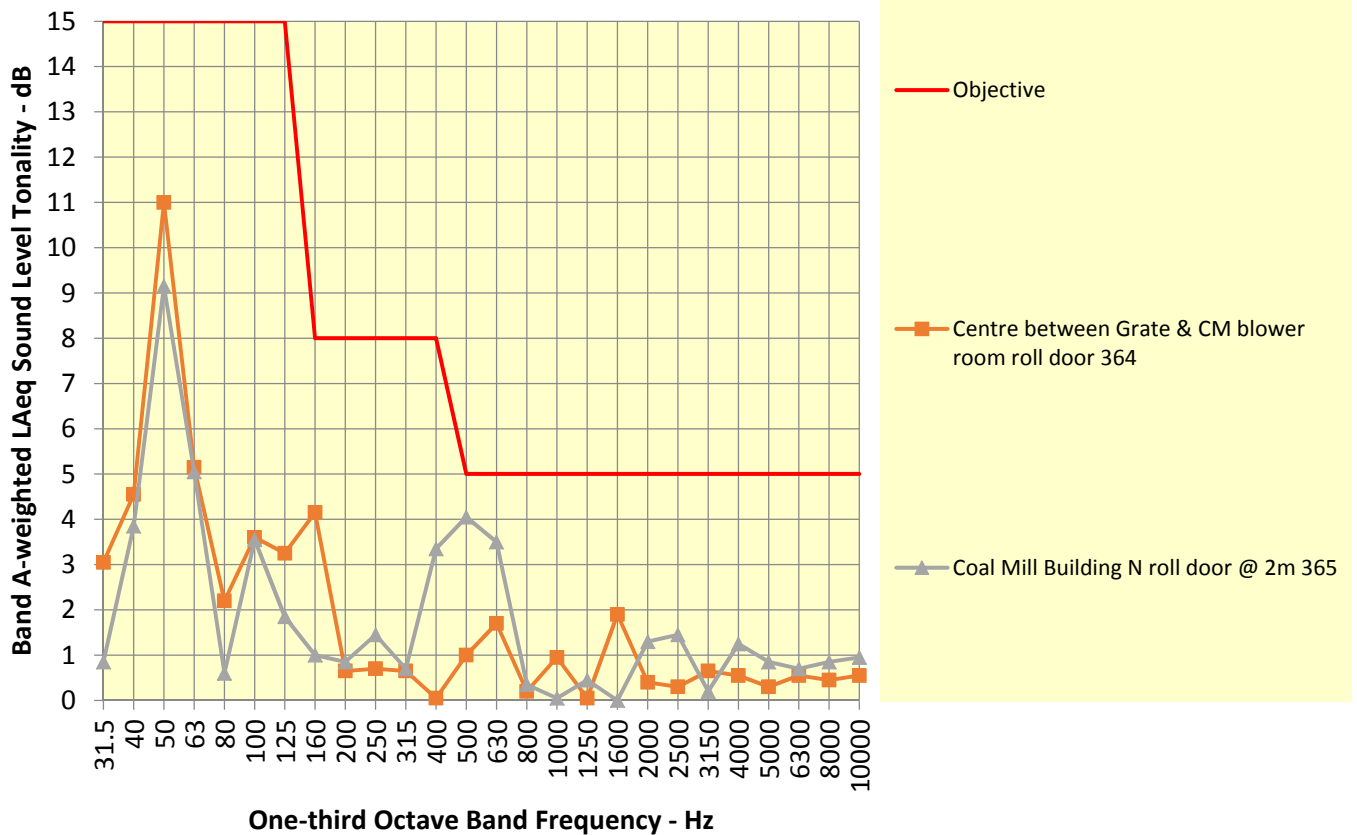


Figure A42A: Boral Cement Berrima Annual Noise 2019 Spectra
Radicon Cooler

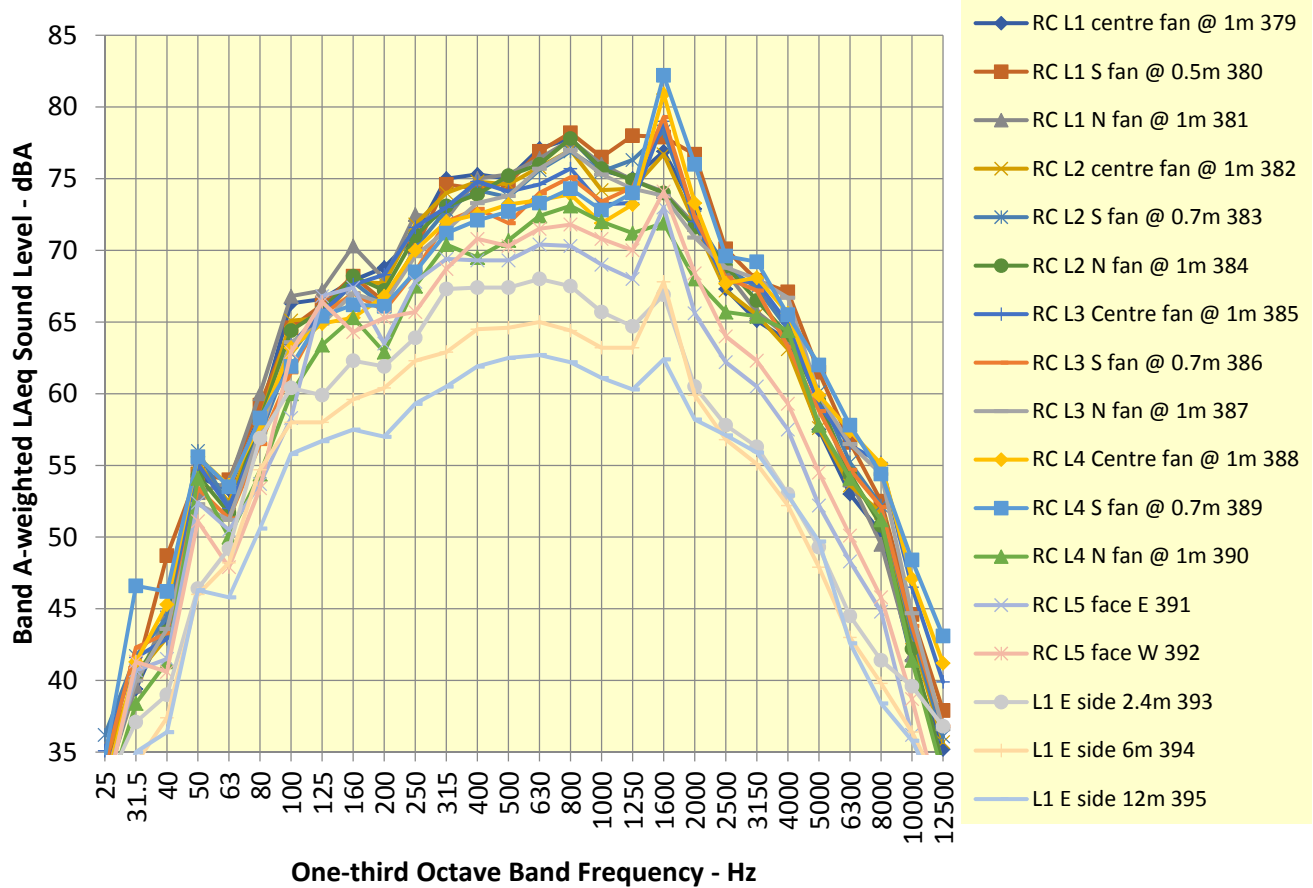


Figure A42B: Boral Cement Berrima Annual Noise 2019 Tonality
Radicon Cooler

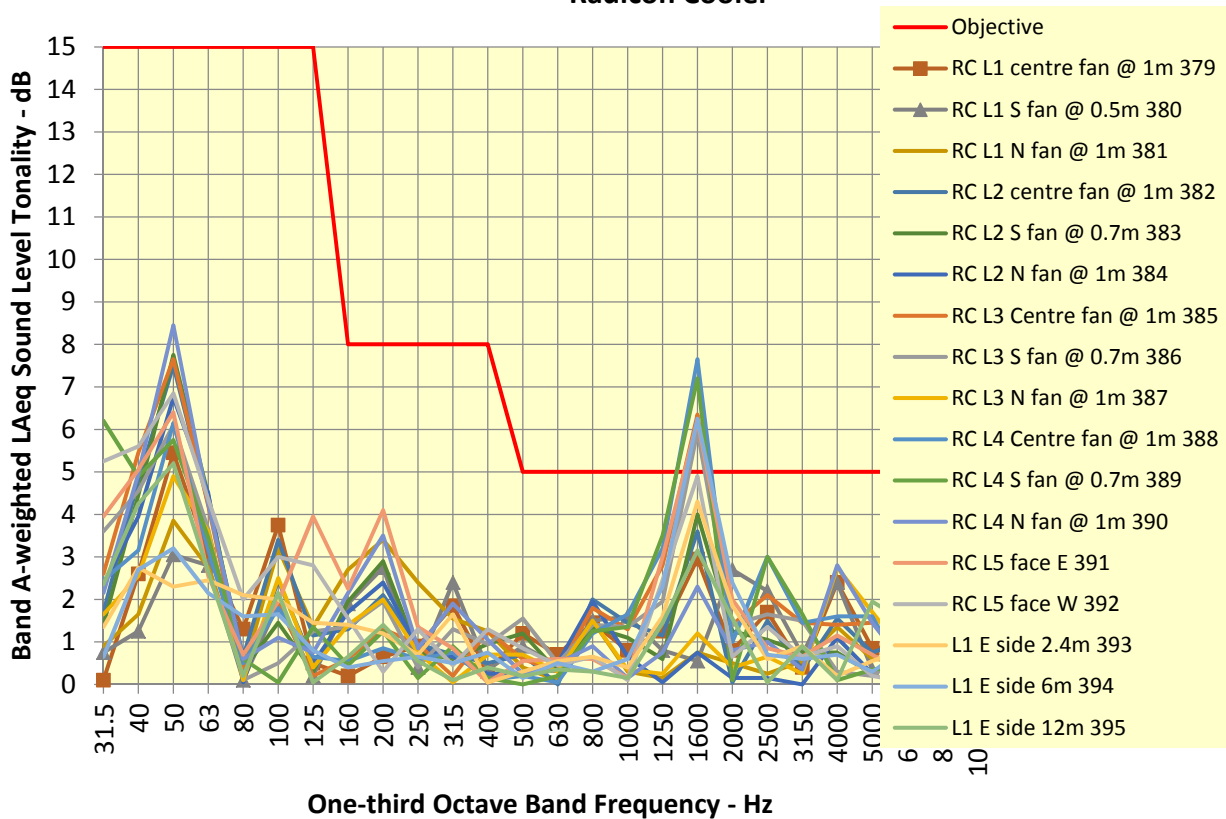


**Figure A43A: Boral Cement Berrima Annual Noise 2019 Spectra
FA215**

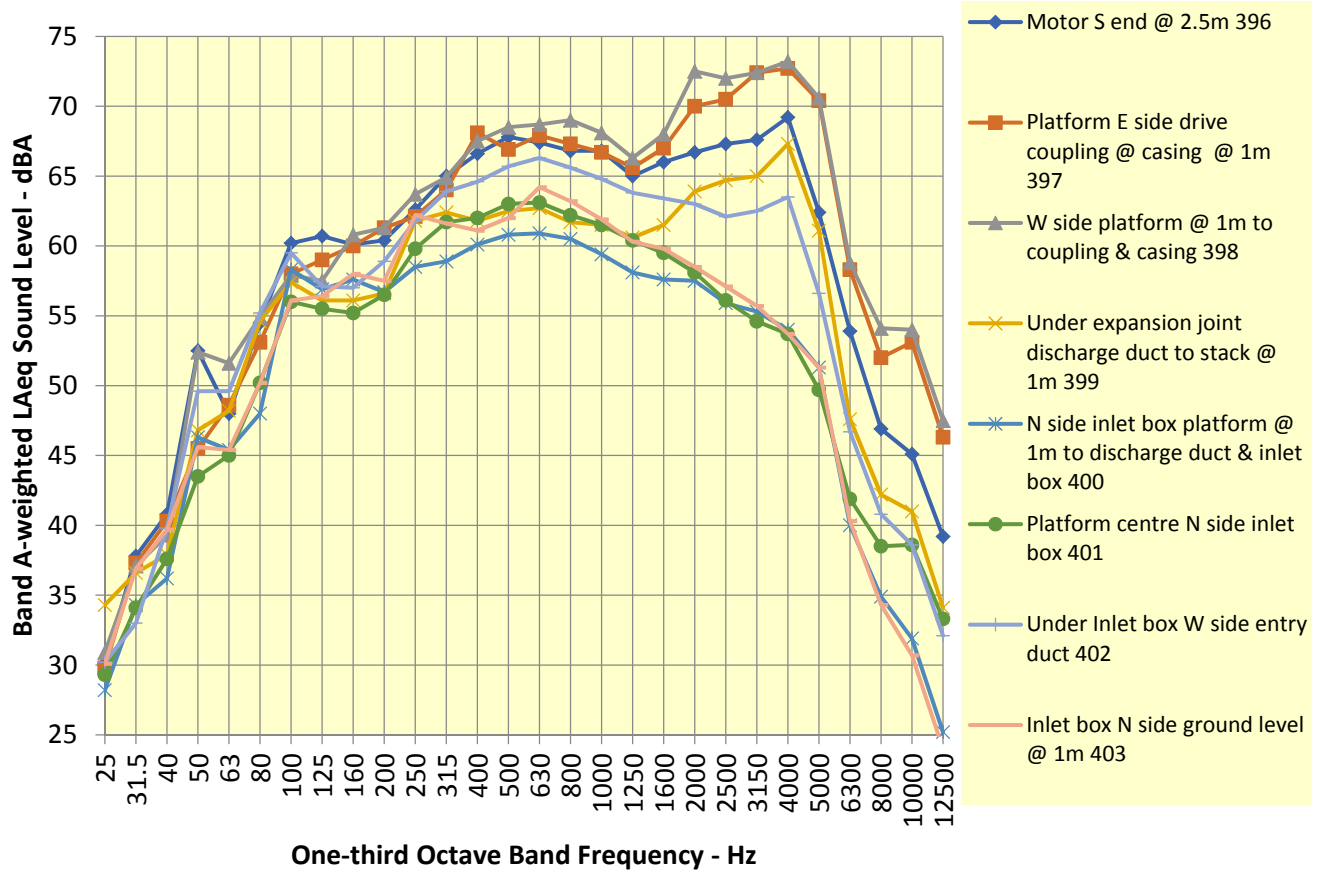


**Figure A43B: Boral Cement Berrima Annual Noise 2019 Tonality
FA215**

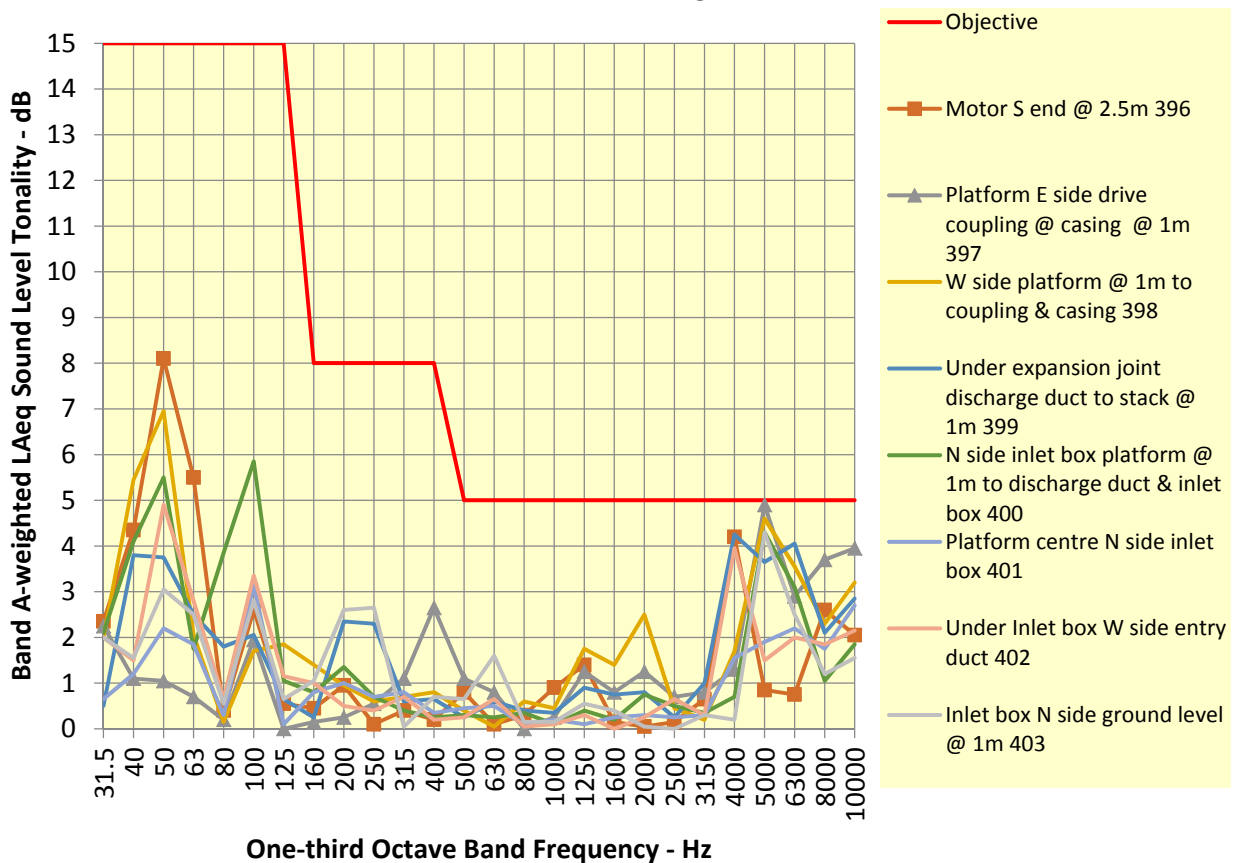


Figure A44A: Boral Cement Berrima Annual Noise 2019 Spectra
Control Building Roof

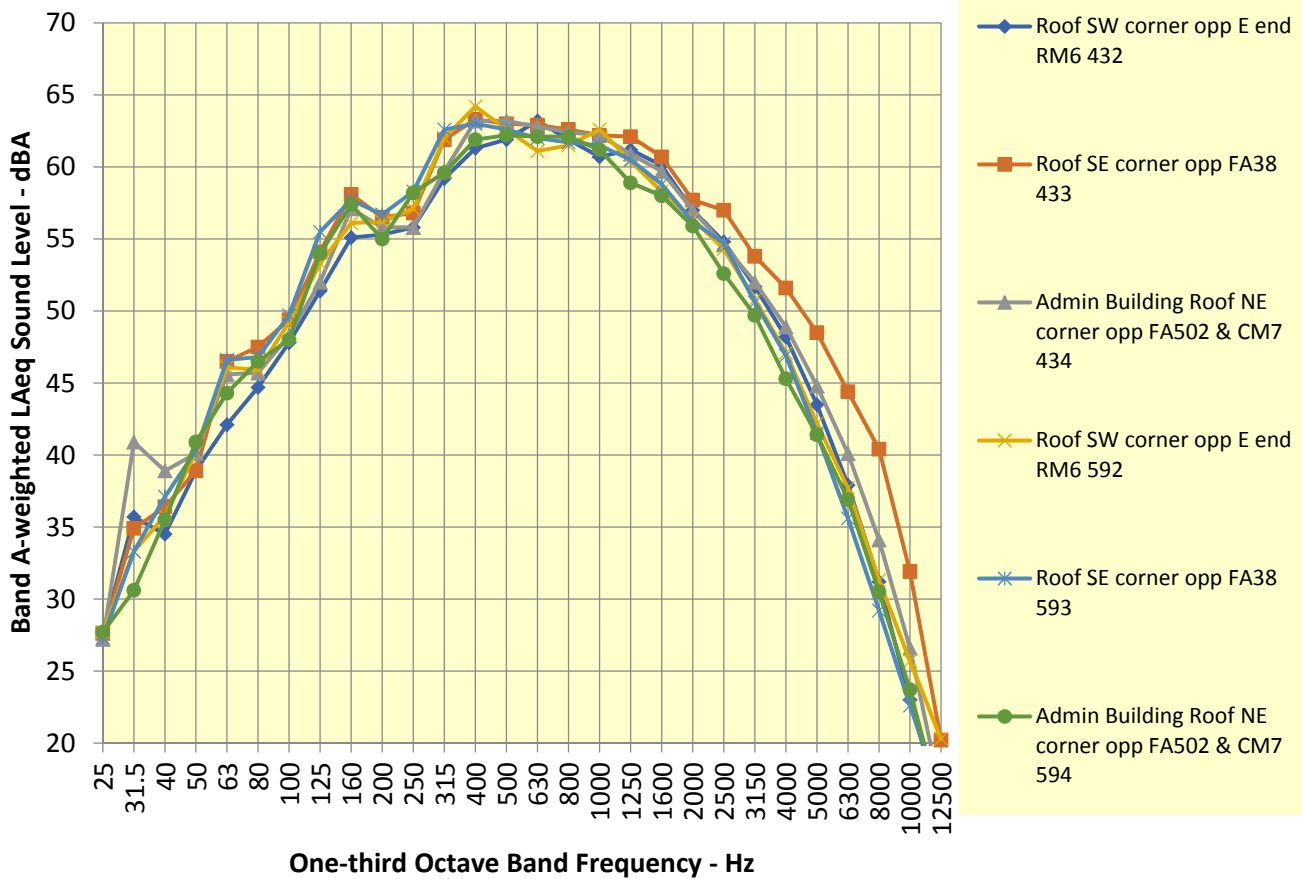


Figure A44B: Boral Cement Berrima Annual Noise 2019 Tonality
Control Building Roof

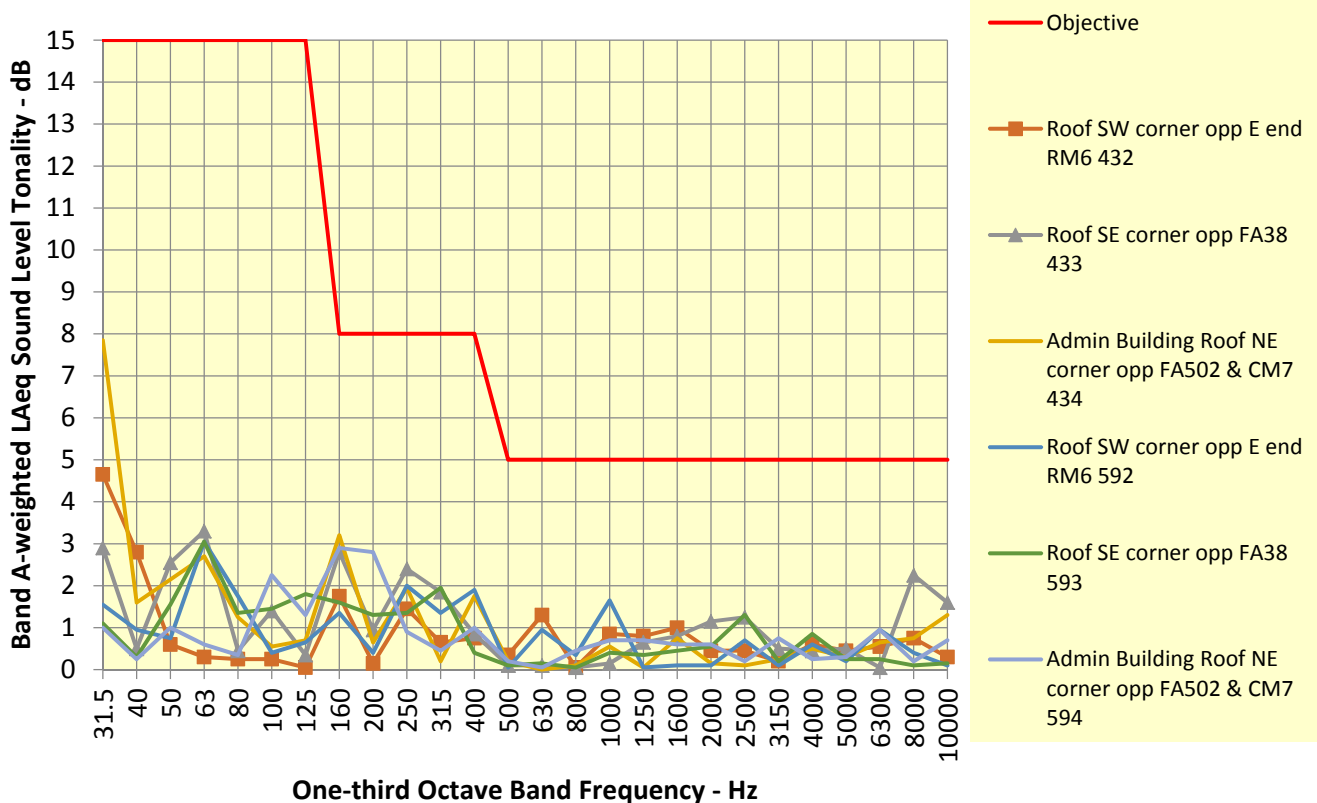


Figure A45A: Boral Cement Berrima Annual Noise 2019 Spectra
CM7 Western side

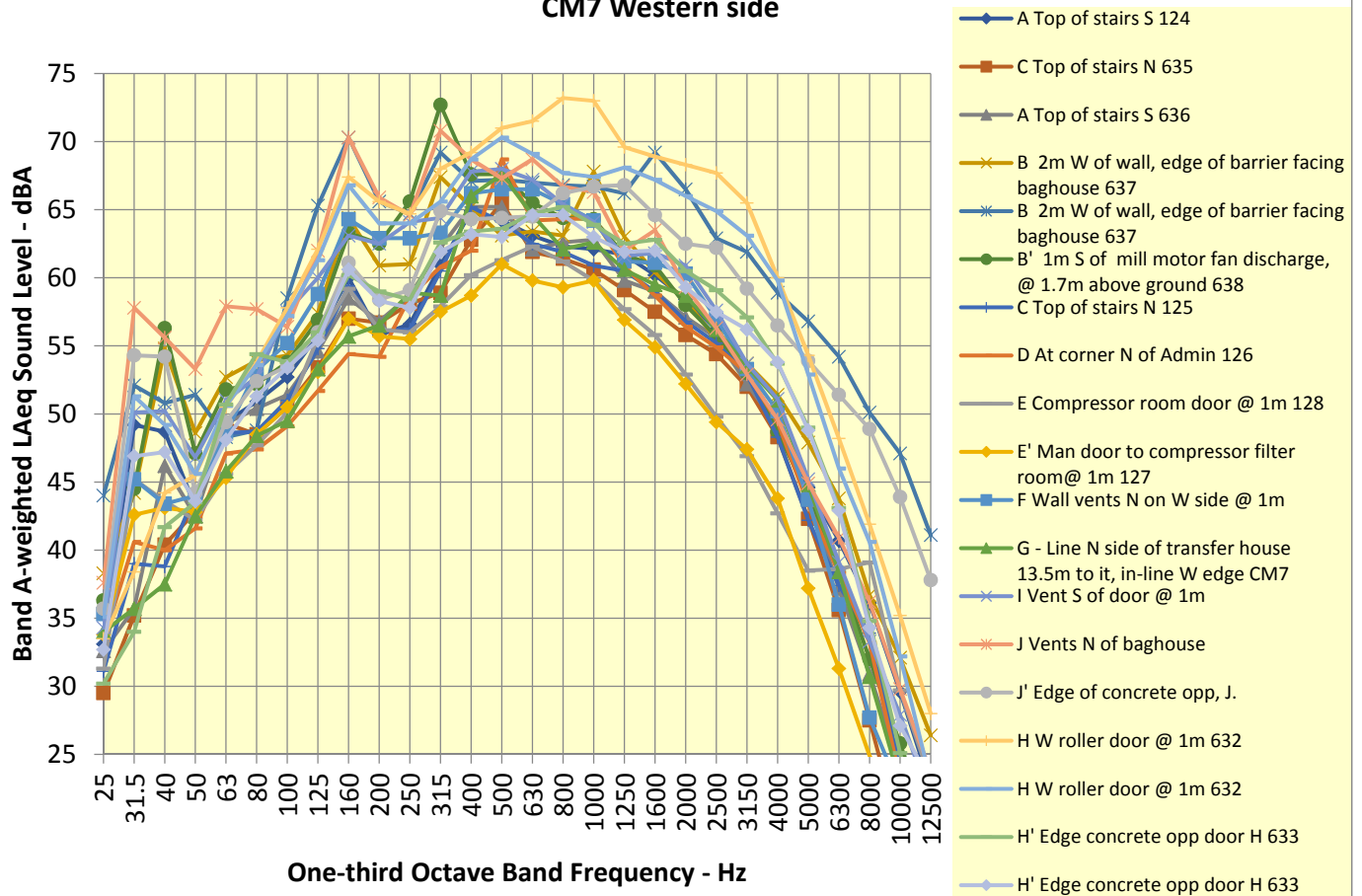


Figure A45B: Boral Cement Berrima Annual Noise 2019 Tonality
CM7 Western side

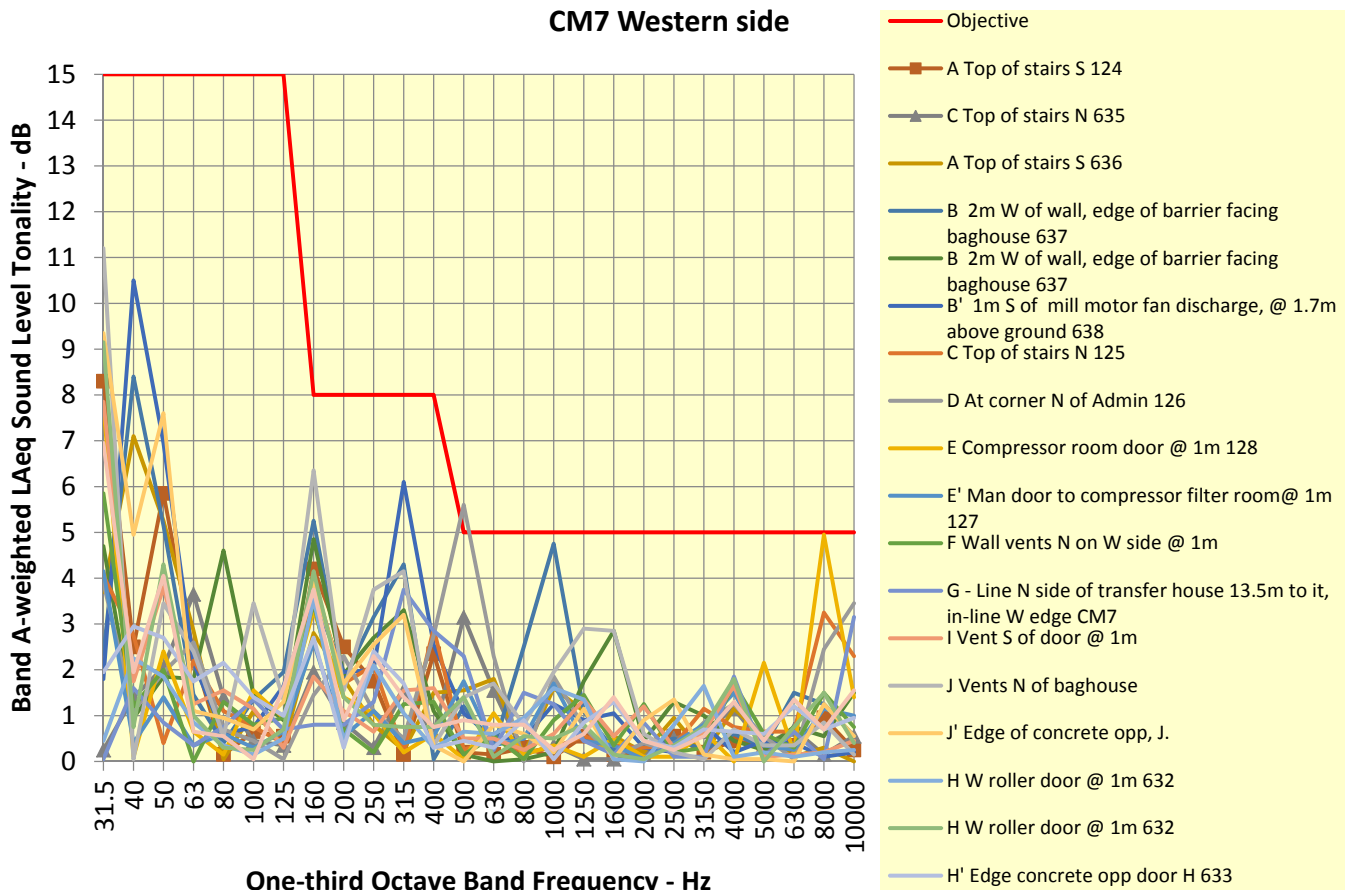


Figure A46A: Boral Cement Berrima Annual Noise 2019 Spectra
CM7 Northern side

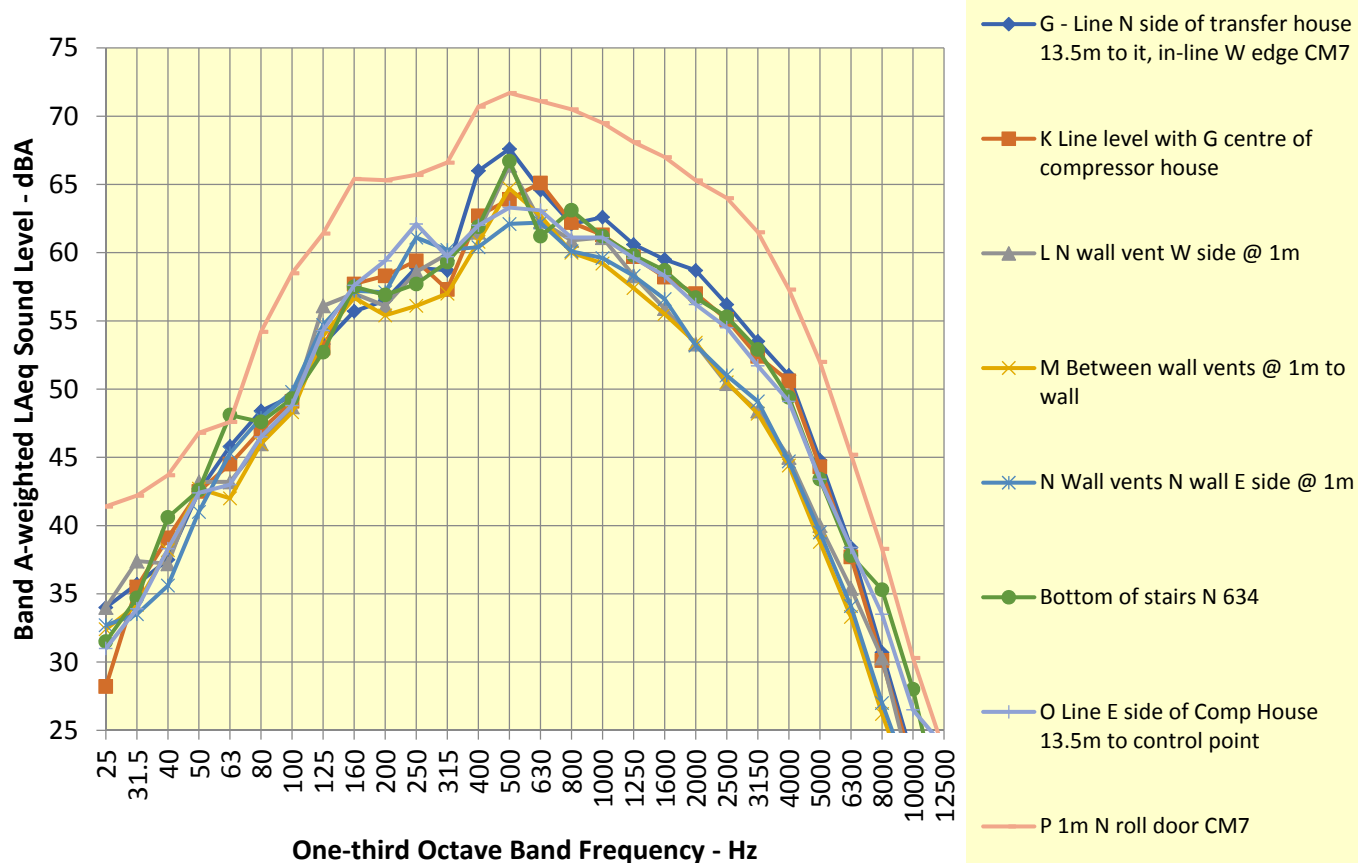


Figure A46B: Boral Cement Berrima Annual Noise 2019 Tonality
CM7 Northern side

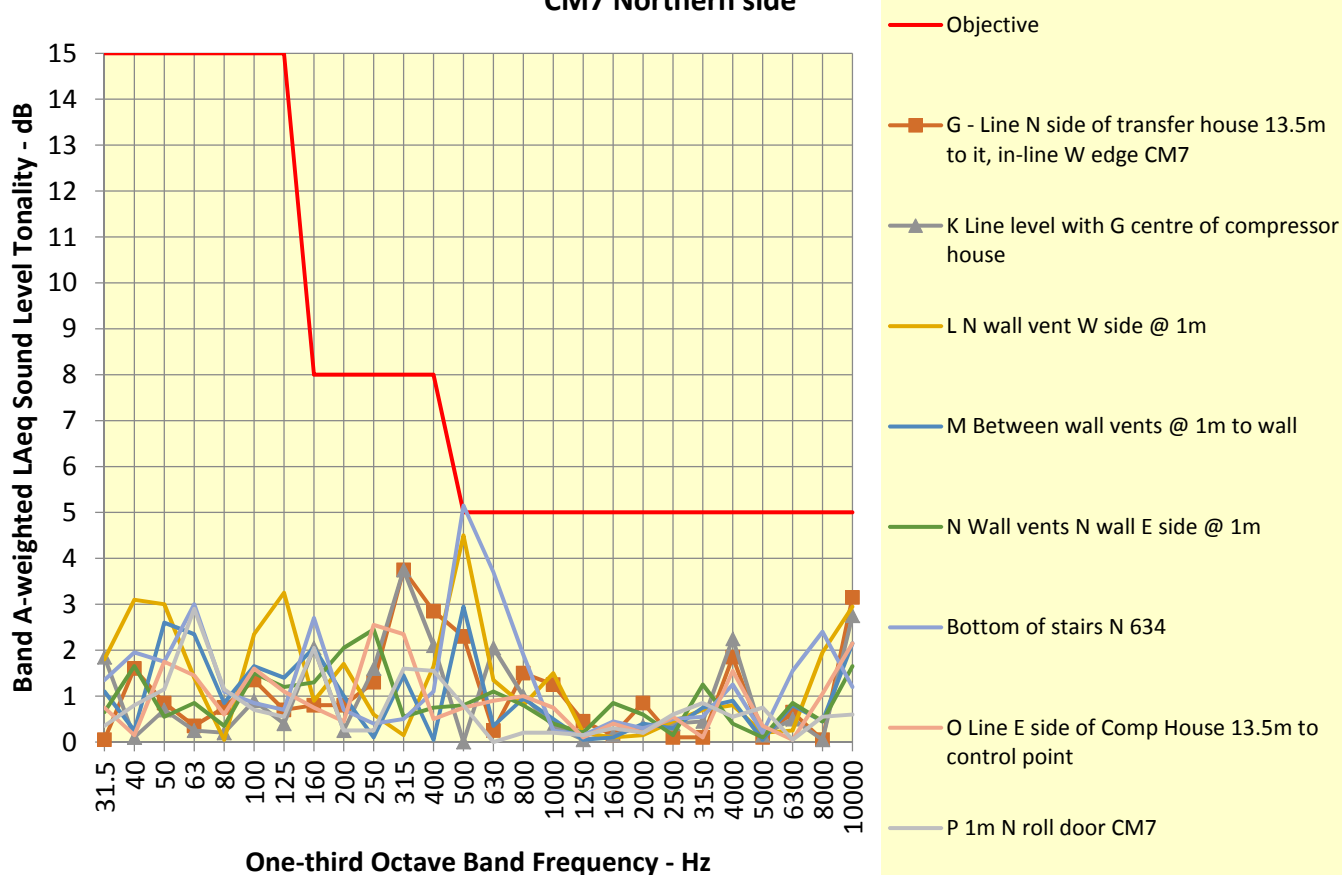


**Figure A47A: Boral Cement Berrima Annual Noise 2019 Spectra
CM7 Southern side**

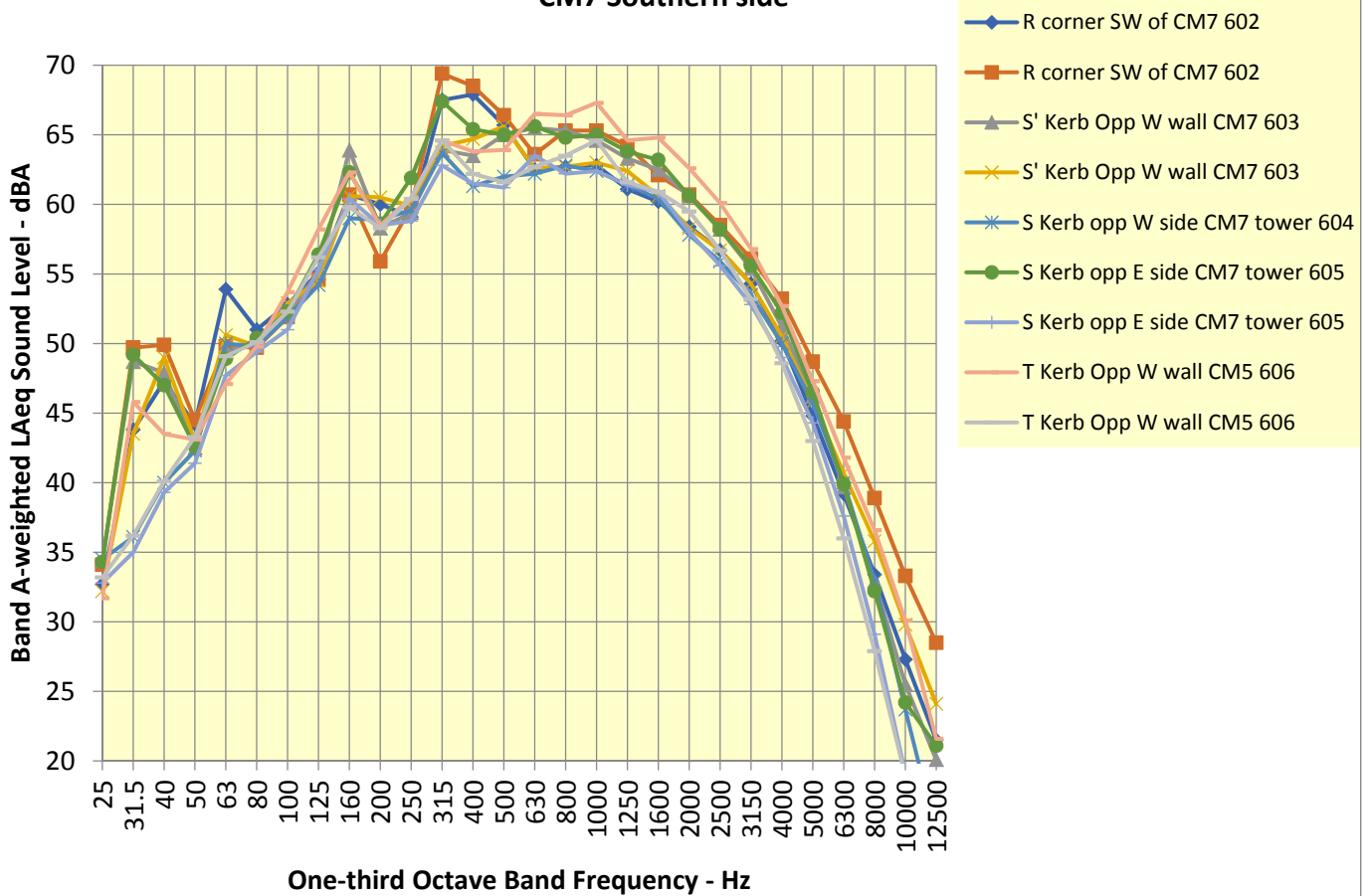


**Figure A47B: Boral Cement Berrima Annual Noise 2019 Tonality
CM7 Southern side**

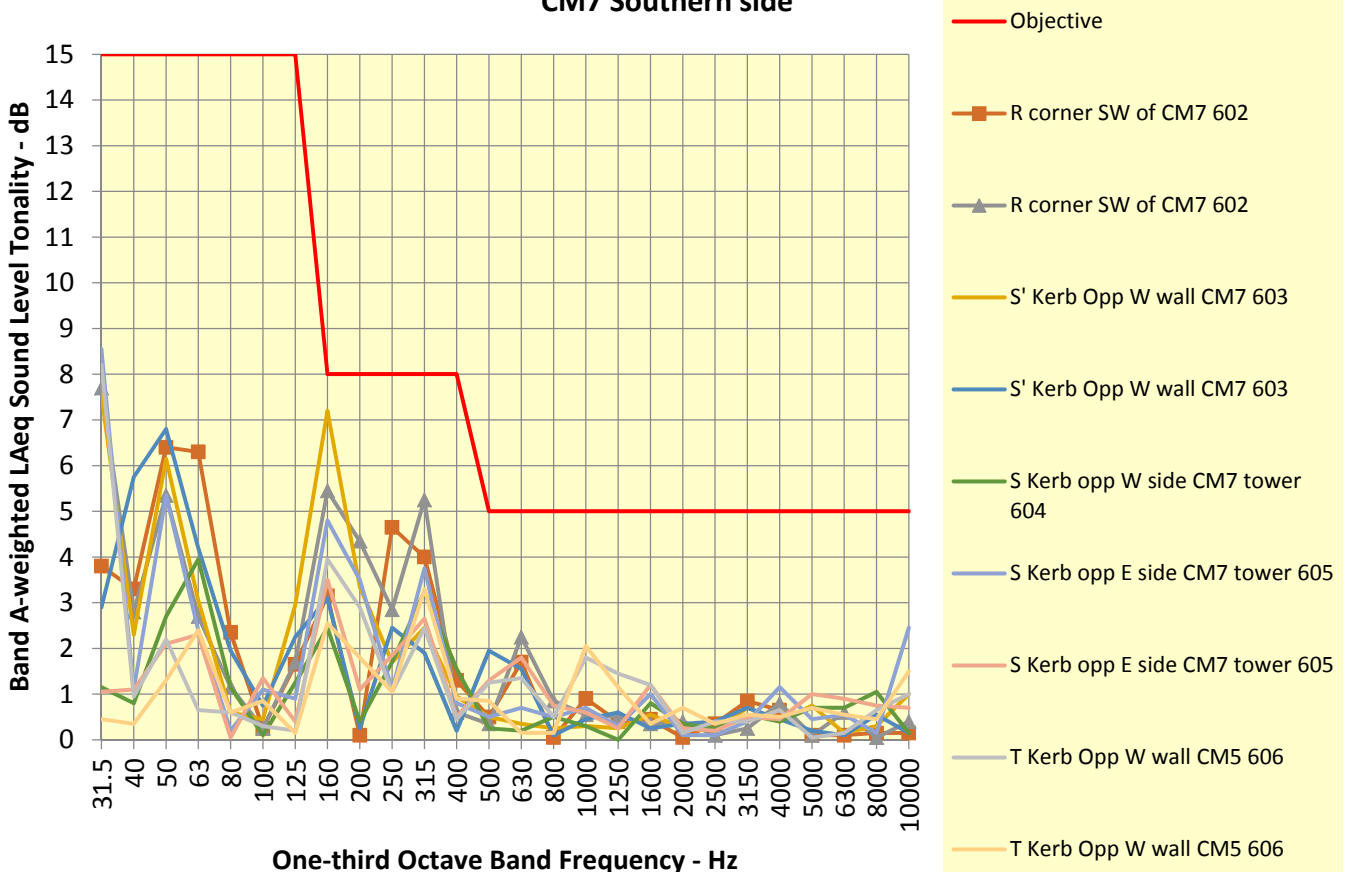


**Figure A48A: Boral Cement Berrima Annual Noise 2019 Spectra
CM7 TS3 Platform**

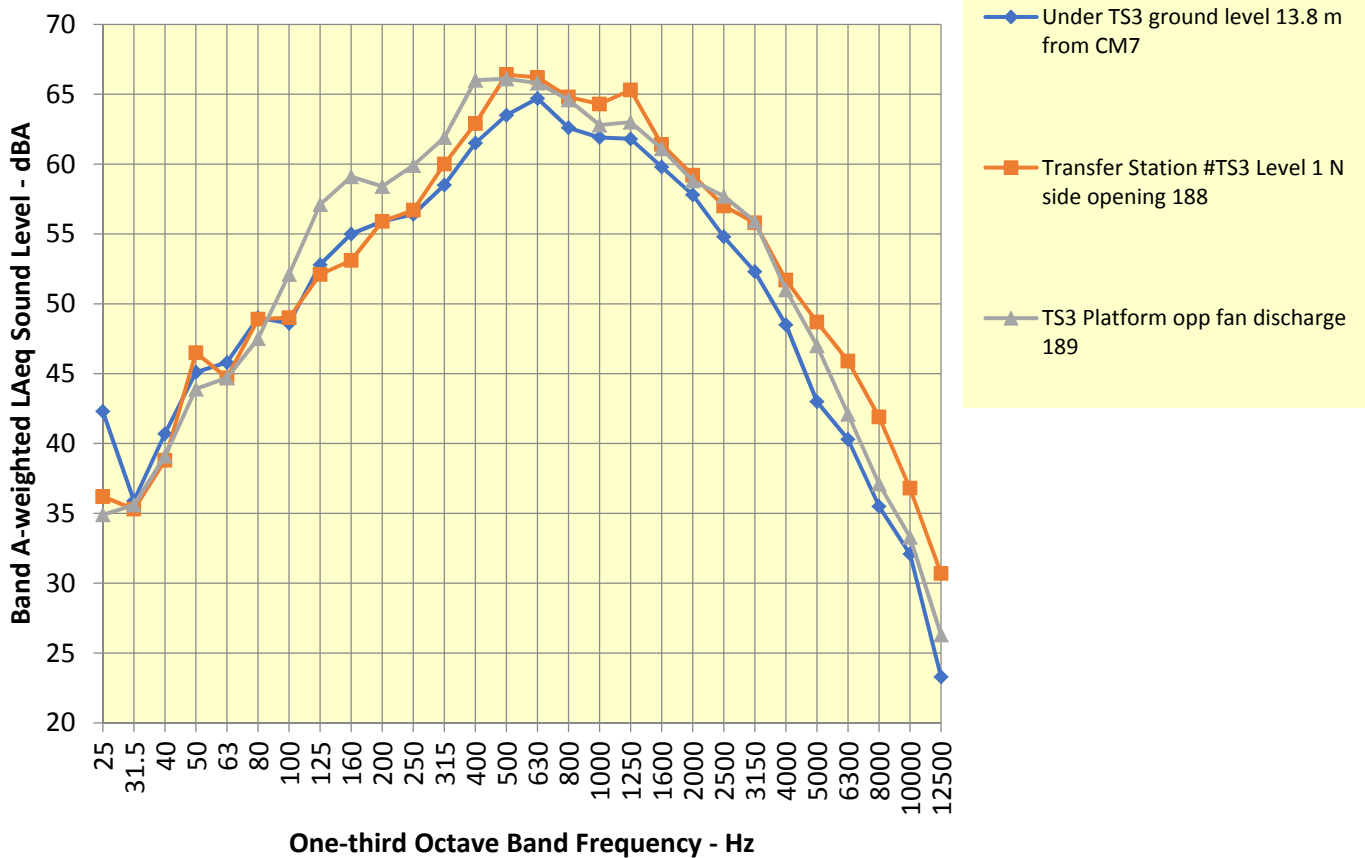


**Figure A48B: Boral Cement Berrima Annual Noise 2019 Tonality
CM7 TS3 Platform**

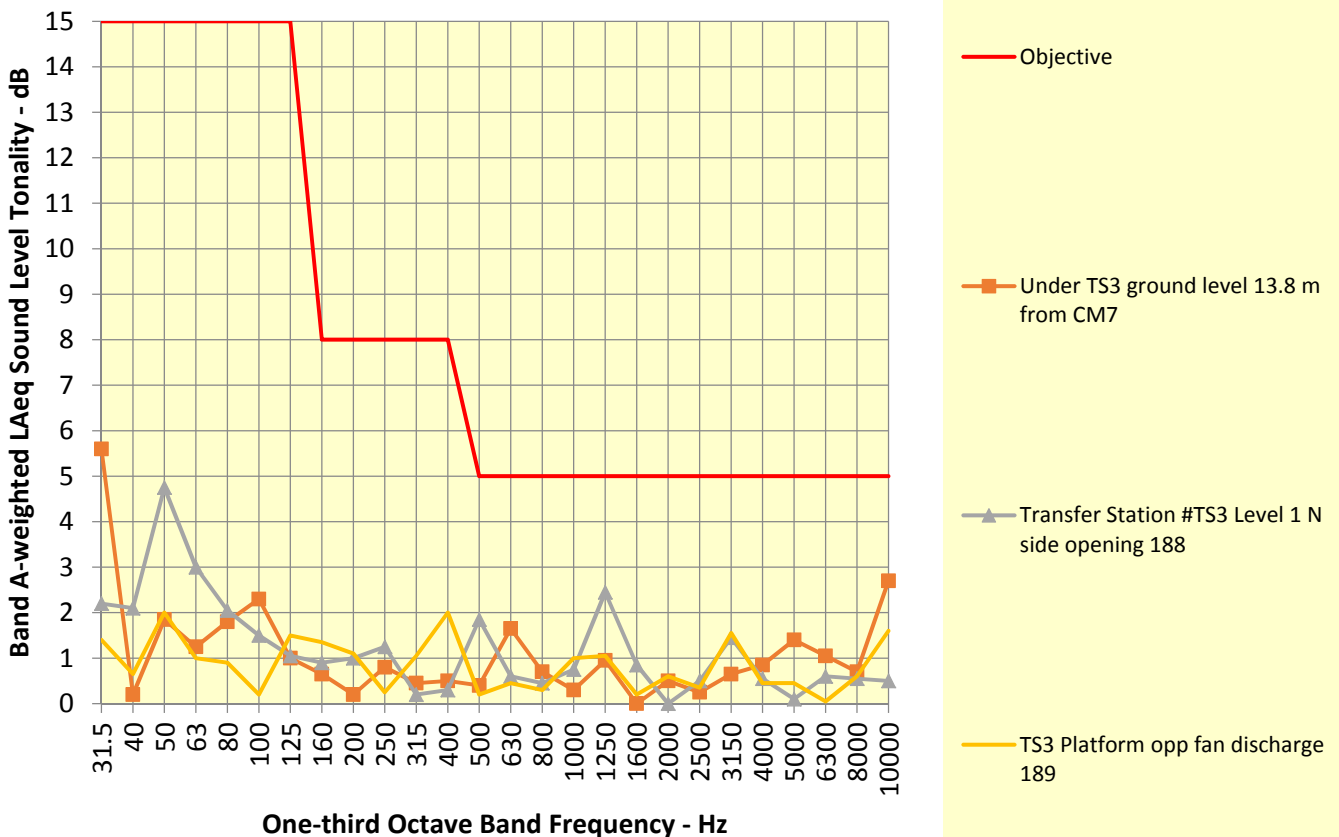


Figure A49A: Boral Cement Berrima Annual Noise 2019 Spectra
CM6 Western Side

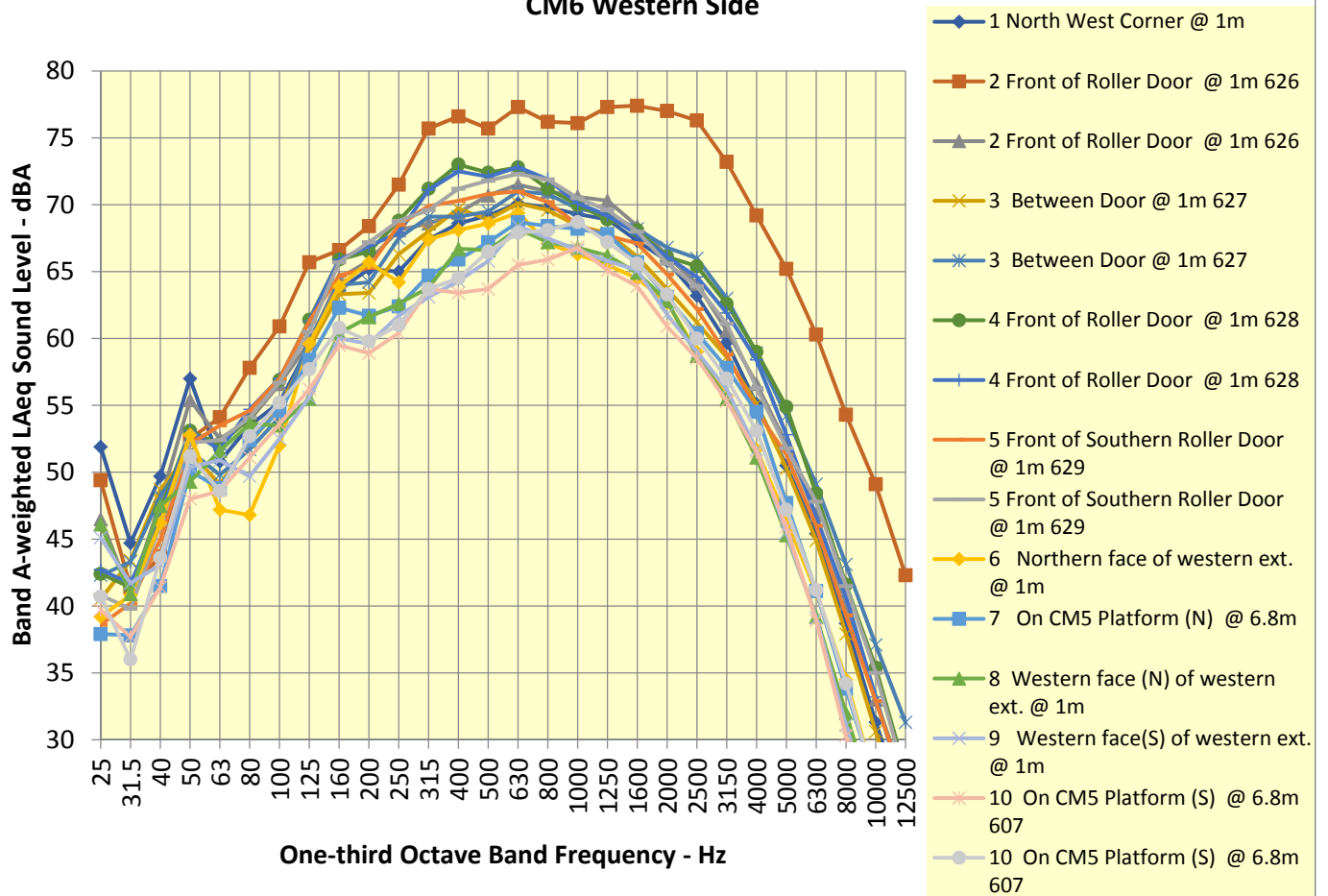


Figure A49B: Boral Cement Berrima Annual Noise 2019 Tonality
CM6 Western side

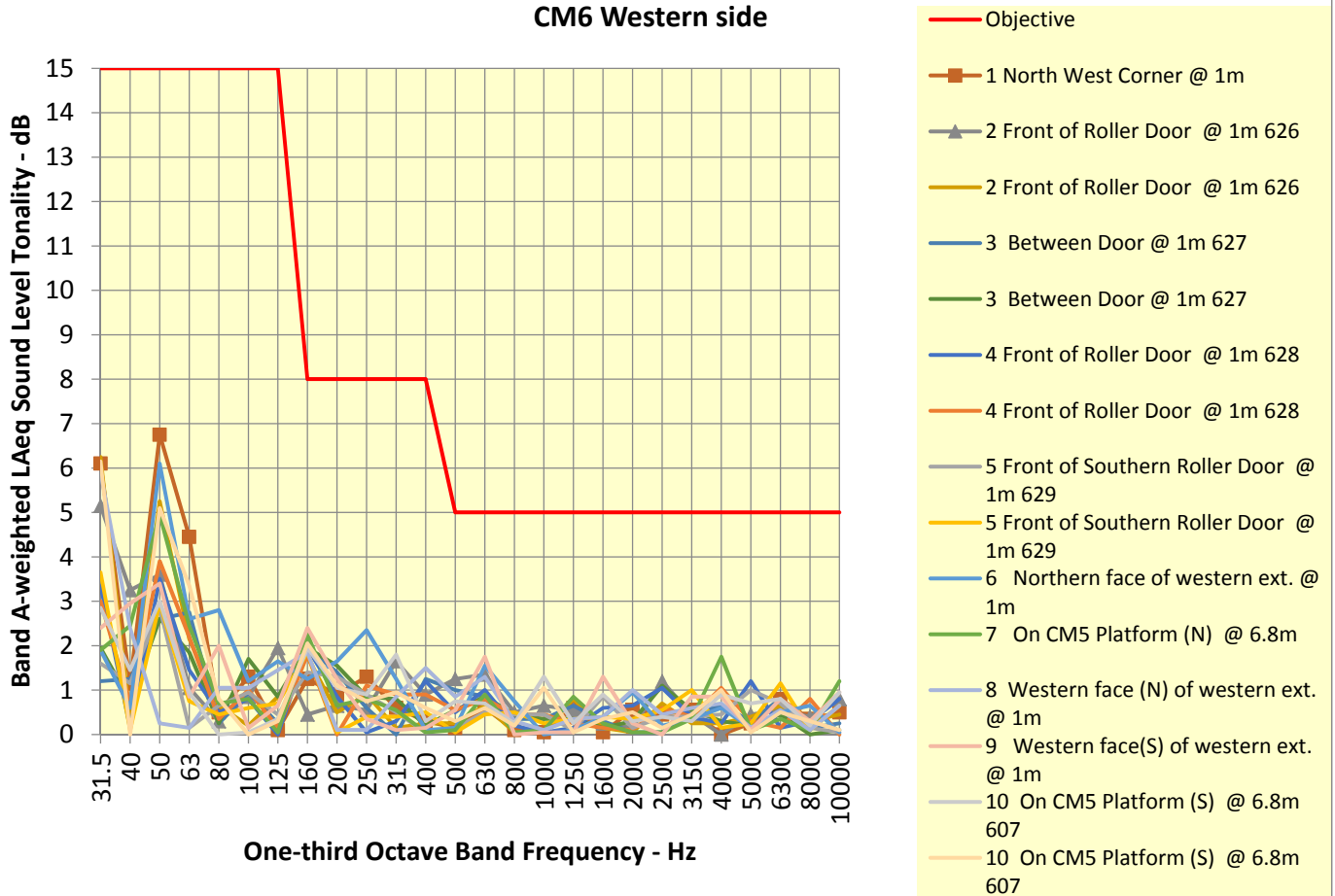


**Figure A50A: Boral Cement Berrima Annual Noise 2019 Spectra
CM6 Southern Side**

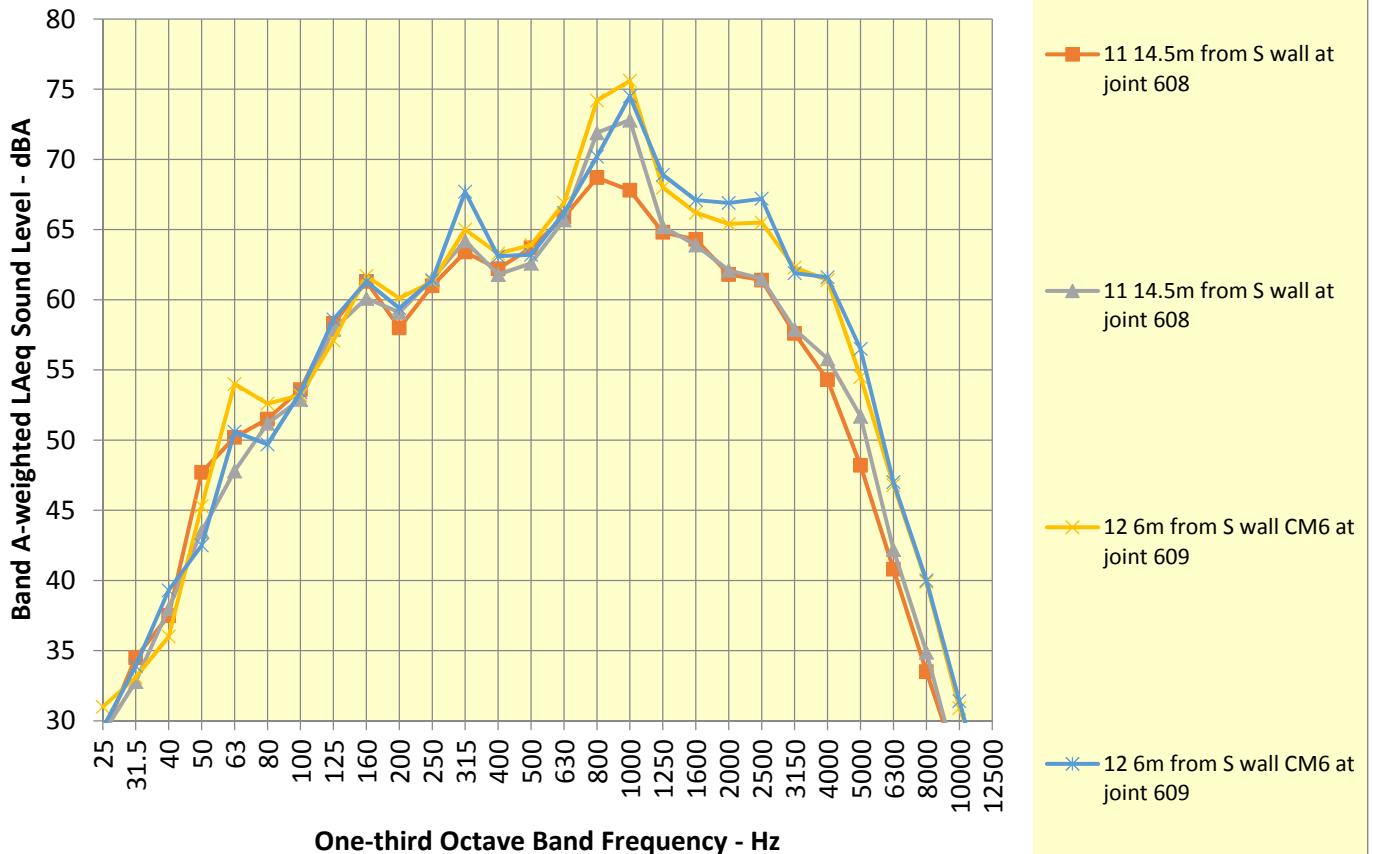


**Figure A50B: Boral Cement Berrima Annual Noise 2019 Tonality
CM6 Southern side**

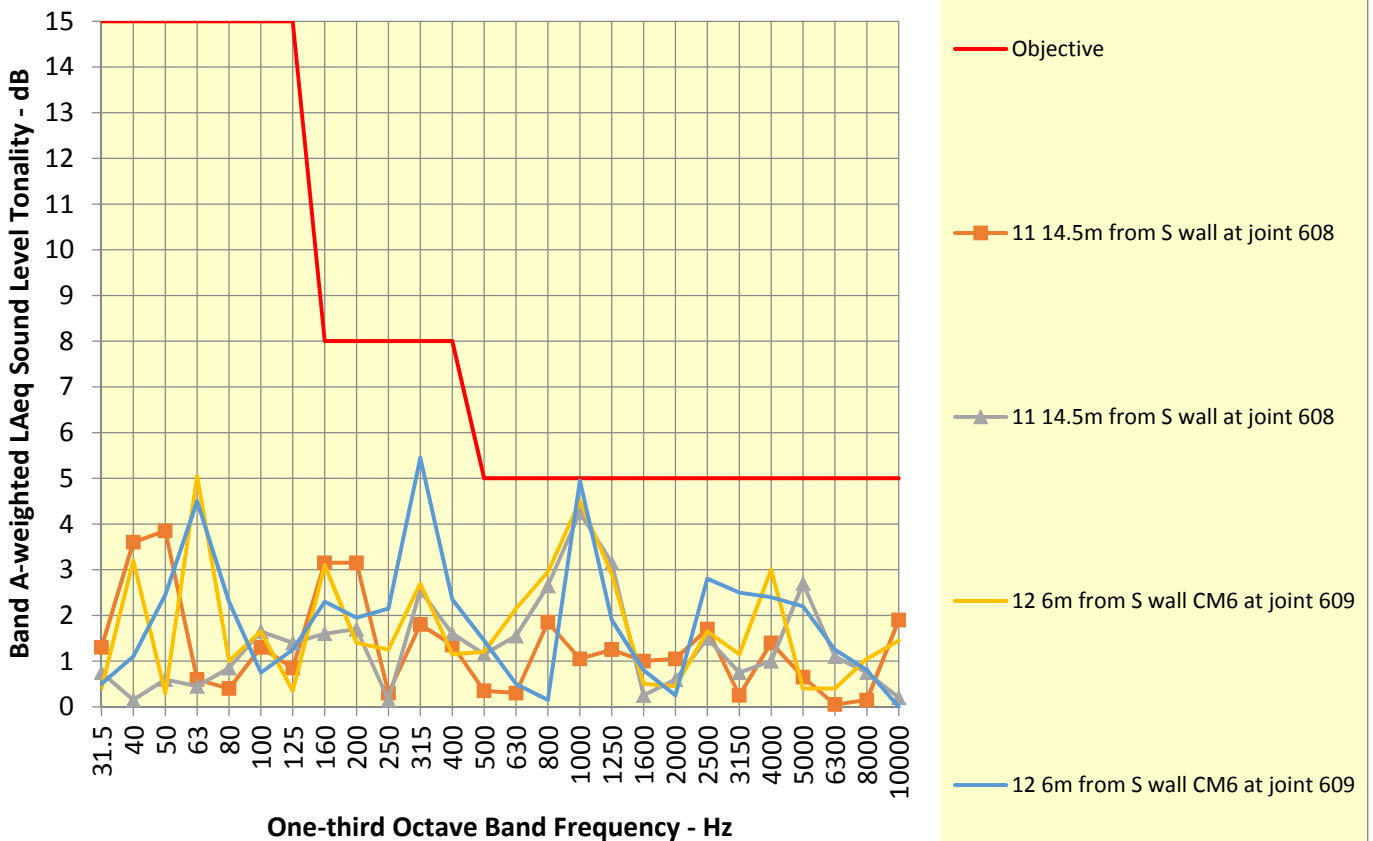


Figure A51A: Boral Cement Berrima Annual Noise 2019 Spectra

CM6 Eastern Side

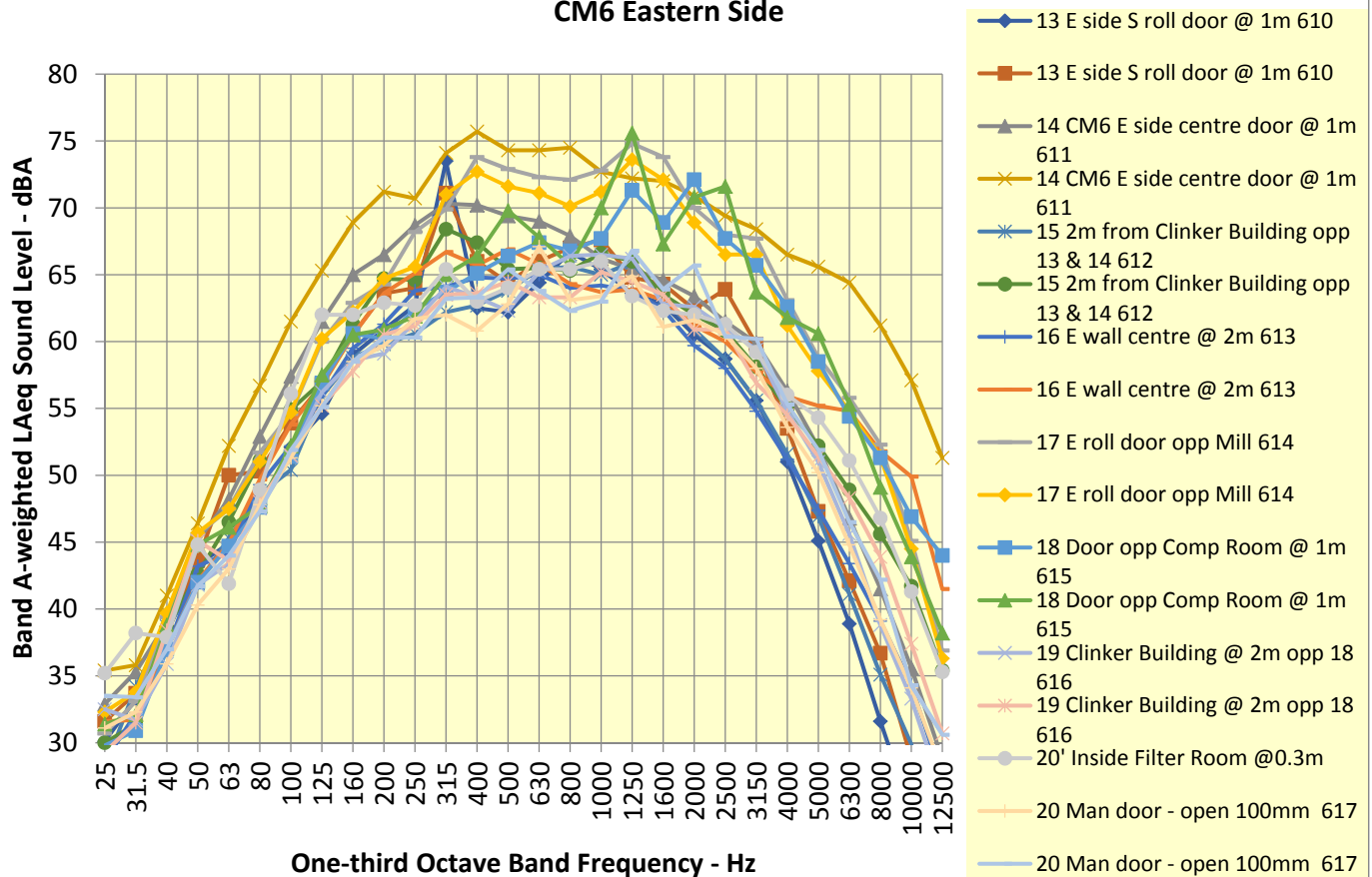


Figure A51B: Boral Cement Berrima Annual Noise 2019 Tonality

CM6 Eastern side

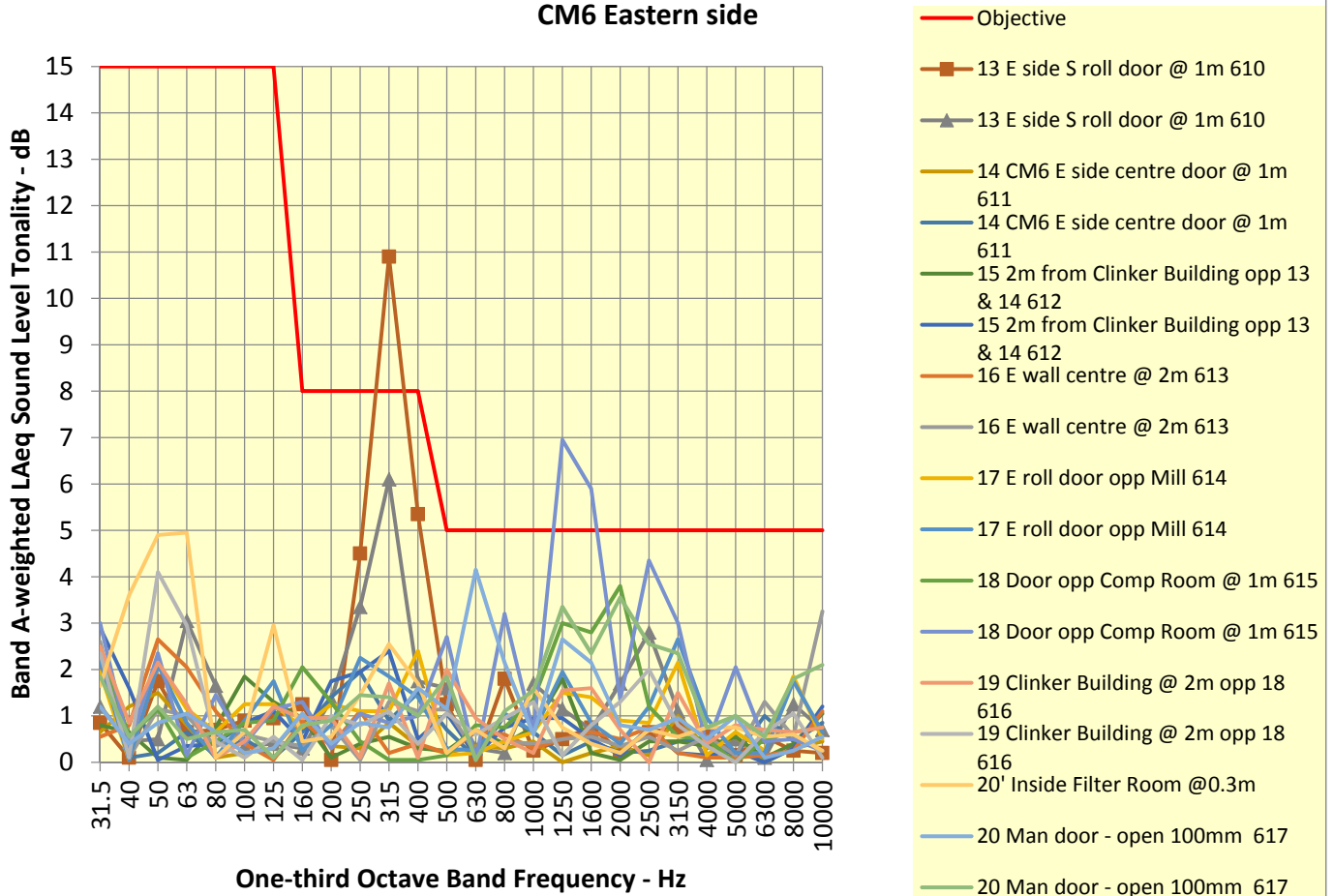


Figure A52A: Boral Cement Berrima Annual Noise 2019 Spectra
CM6 Northern Side

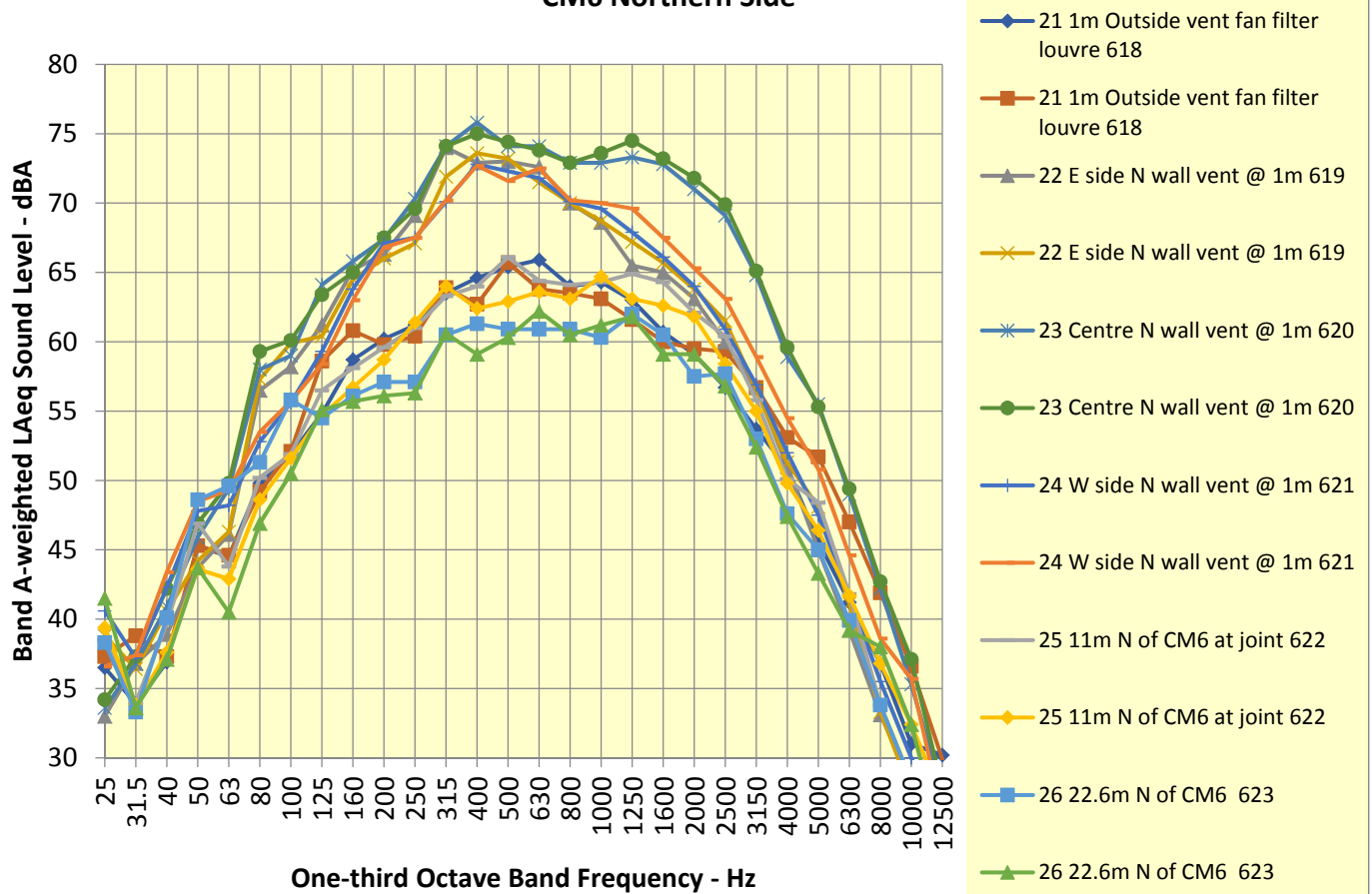


Figure A52B: Boral Cement Berrima Annual Noise 2019 Tonality
CM6 Northern side

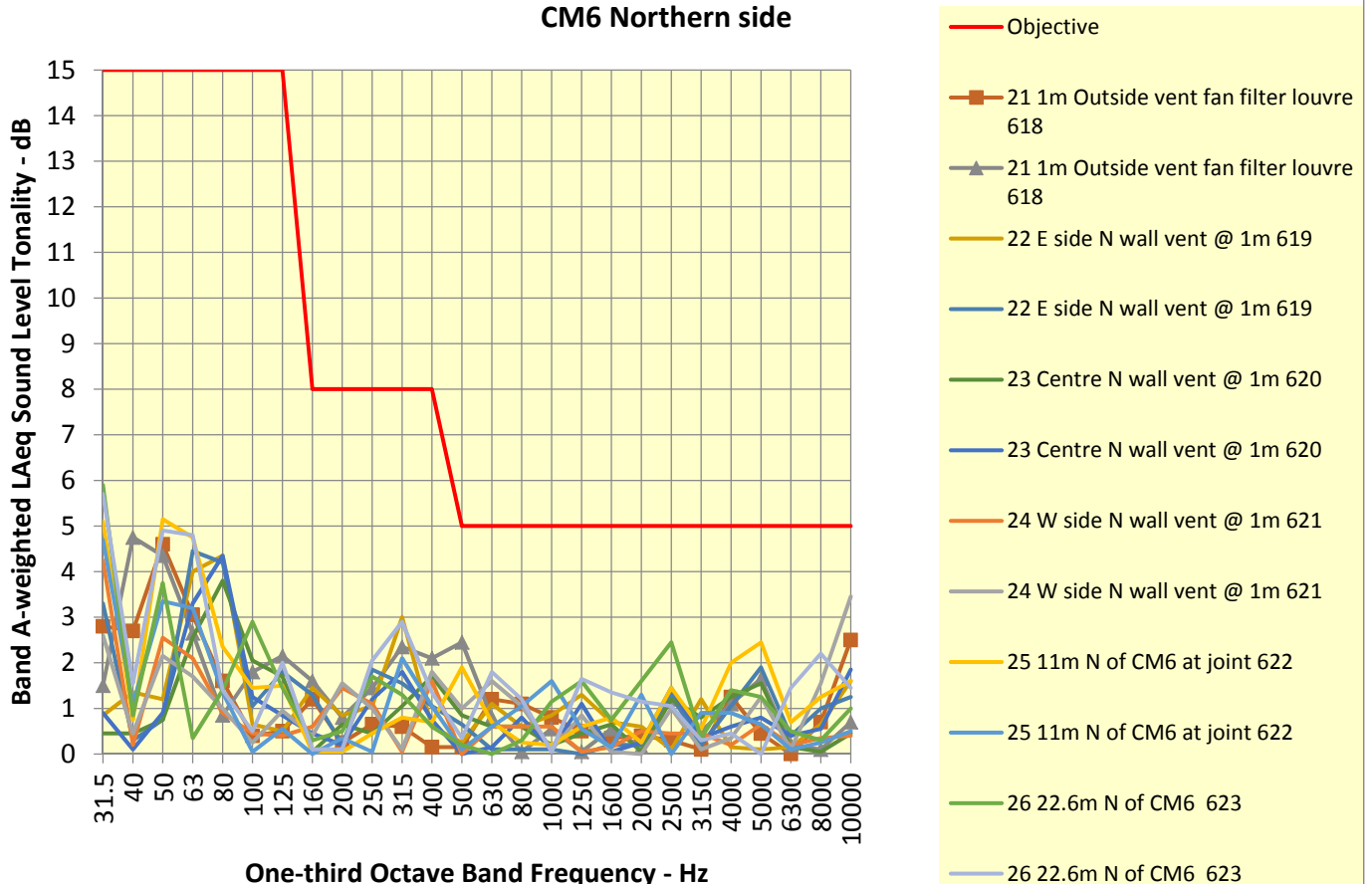


**Figure A53A: Boral Cement Berrima Annual Noise 2019 Spectra
CM6 West Wall Fans and TS2**

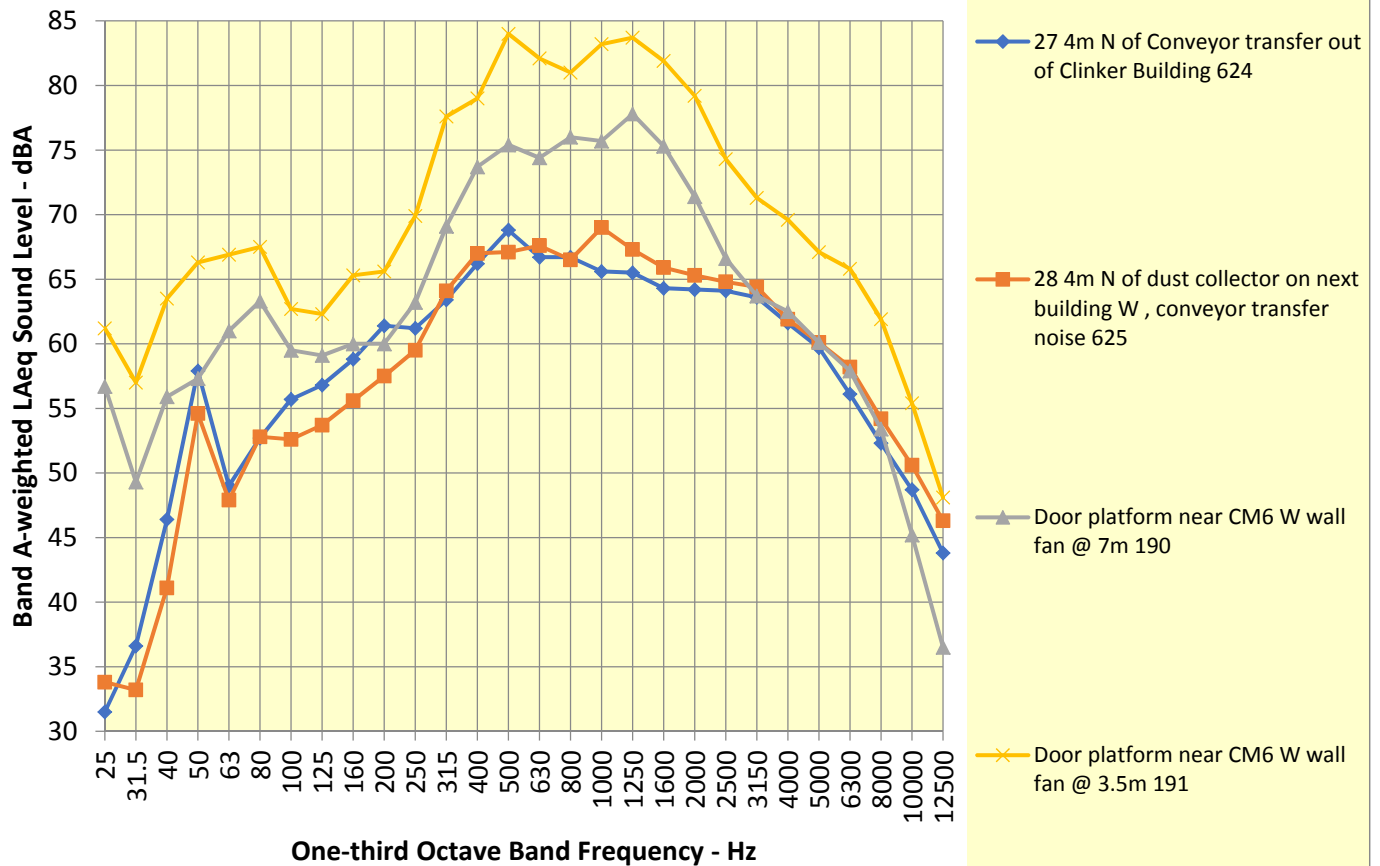


**Figure A53B: Boral Cement Berrima Annual Noise 2019 Tonality
CM6 West wall fans and TS2**

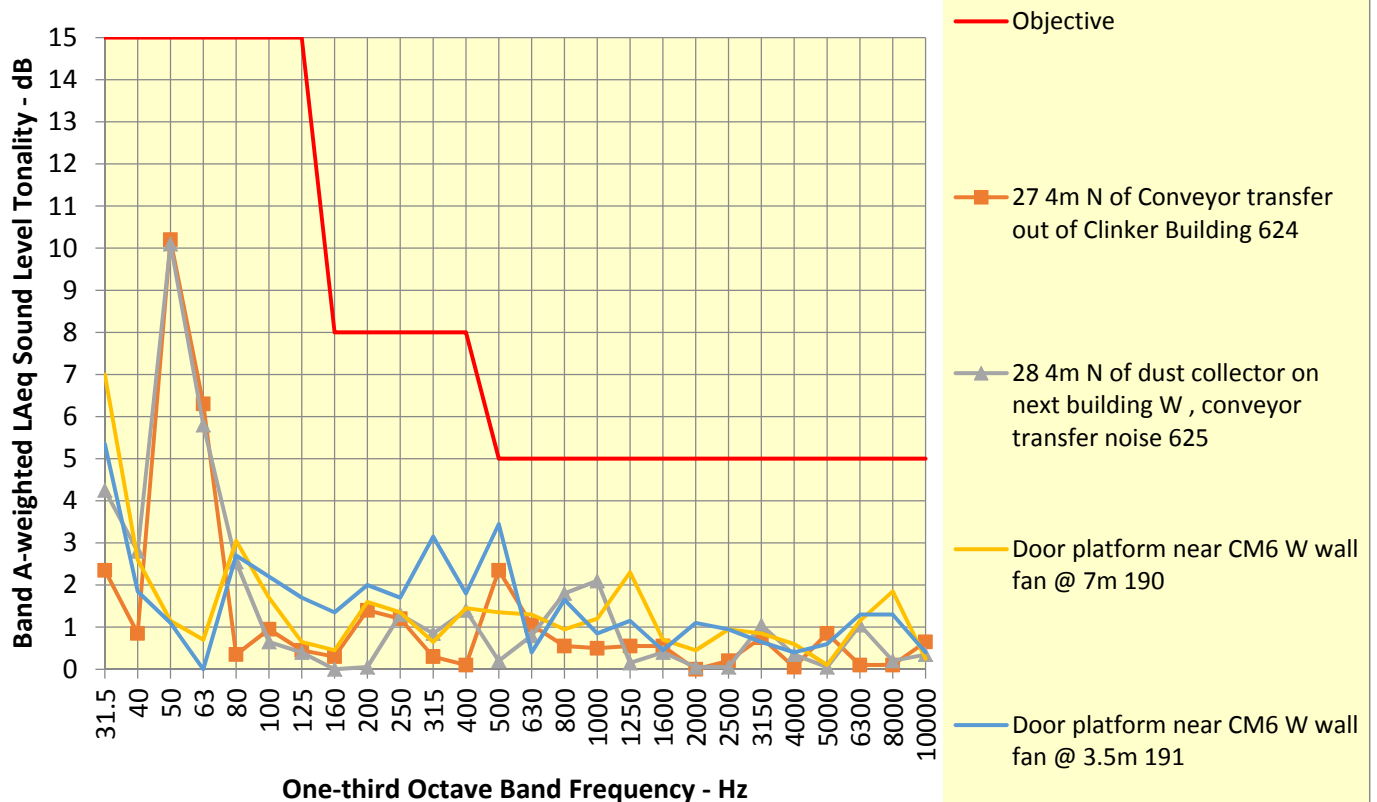


**Figure A54A: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 4 Melbourne St**

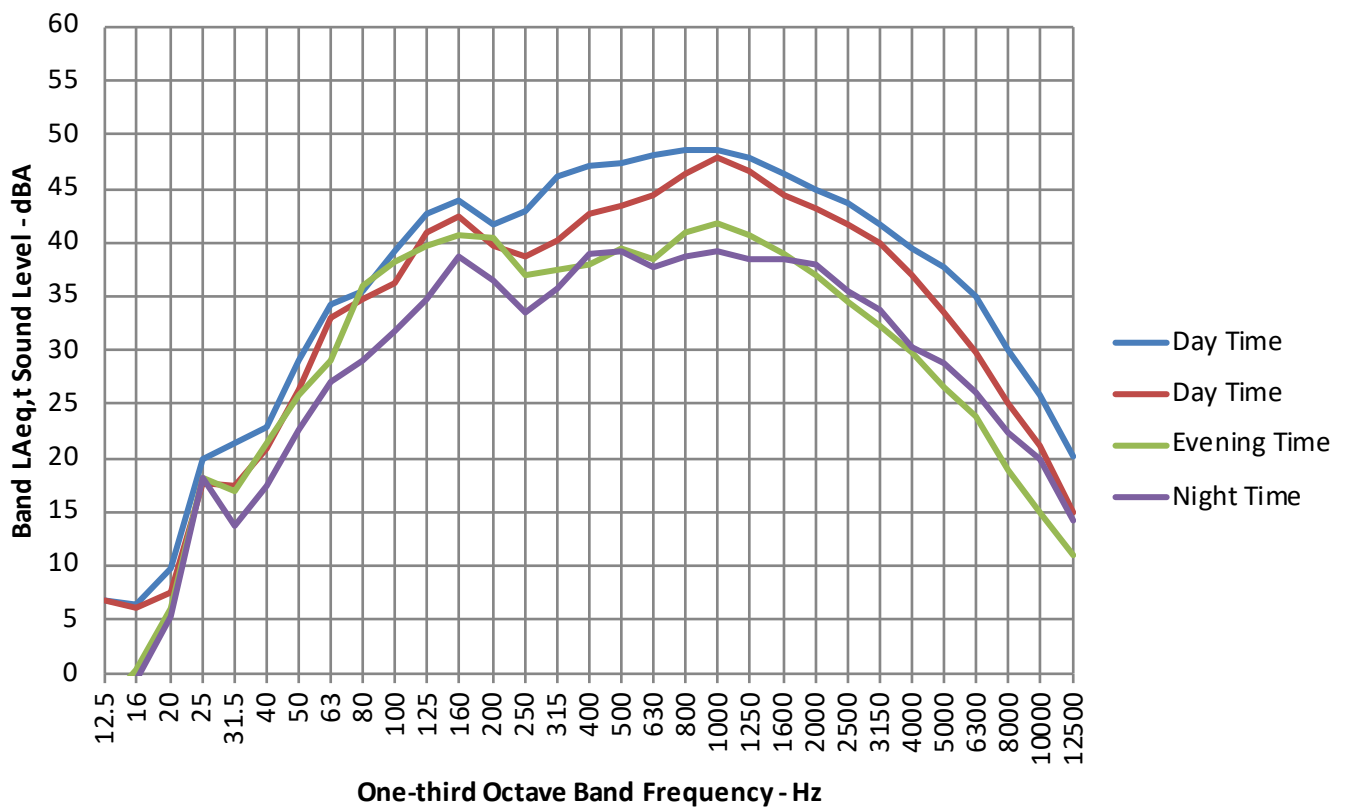


**Figure A54B: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Tonality Spectra 4 Melbourne St**

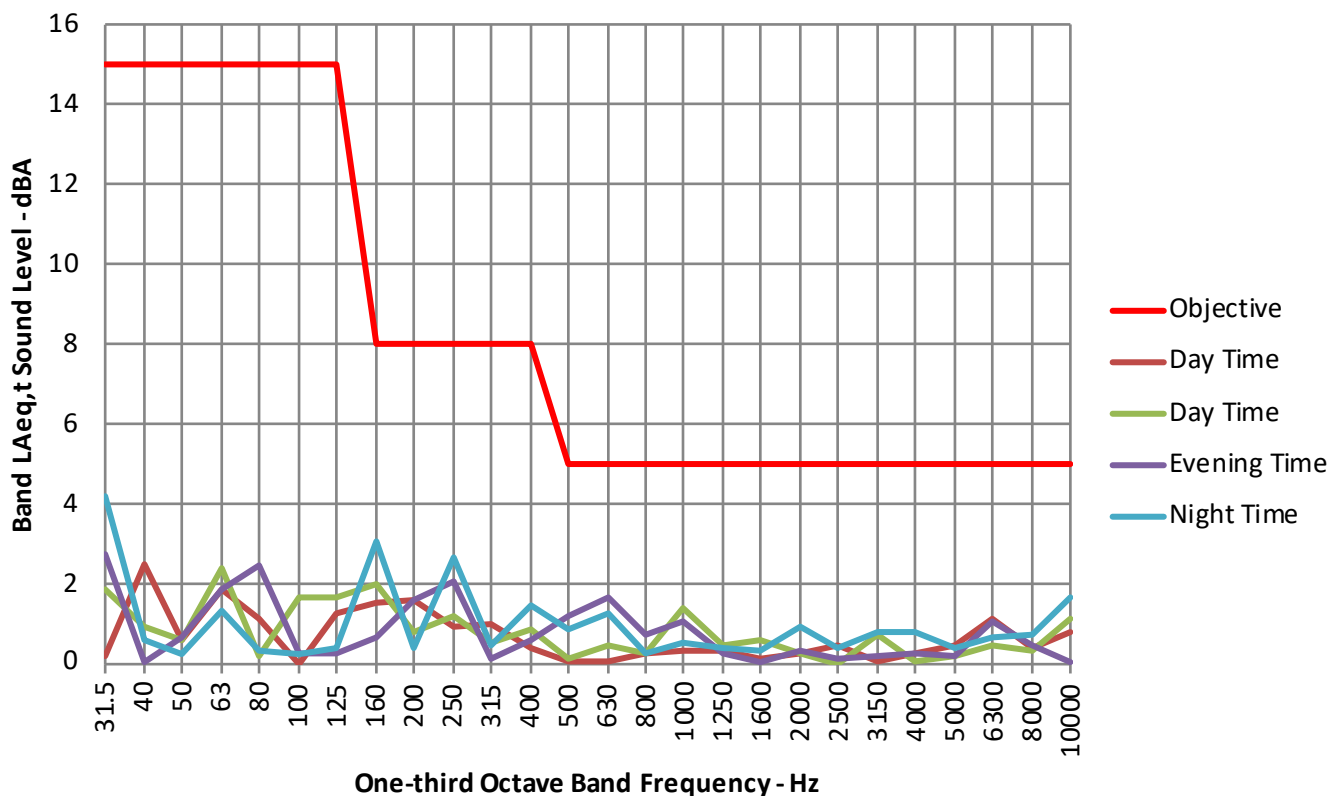


**Figure A55A: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 72 Taylor Ave**

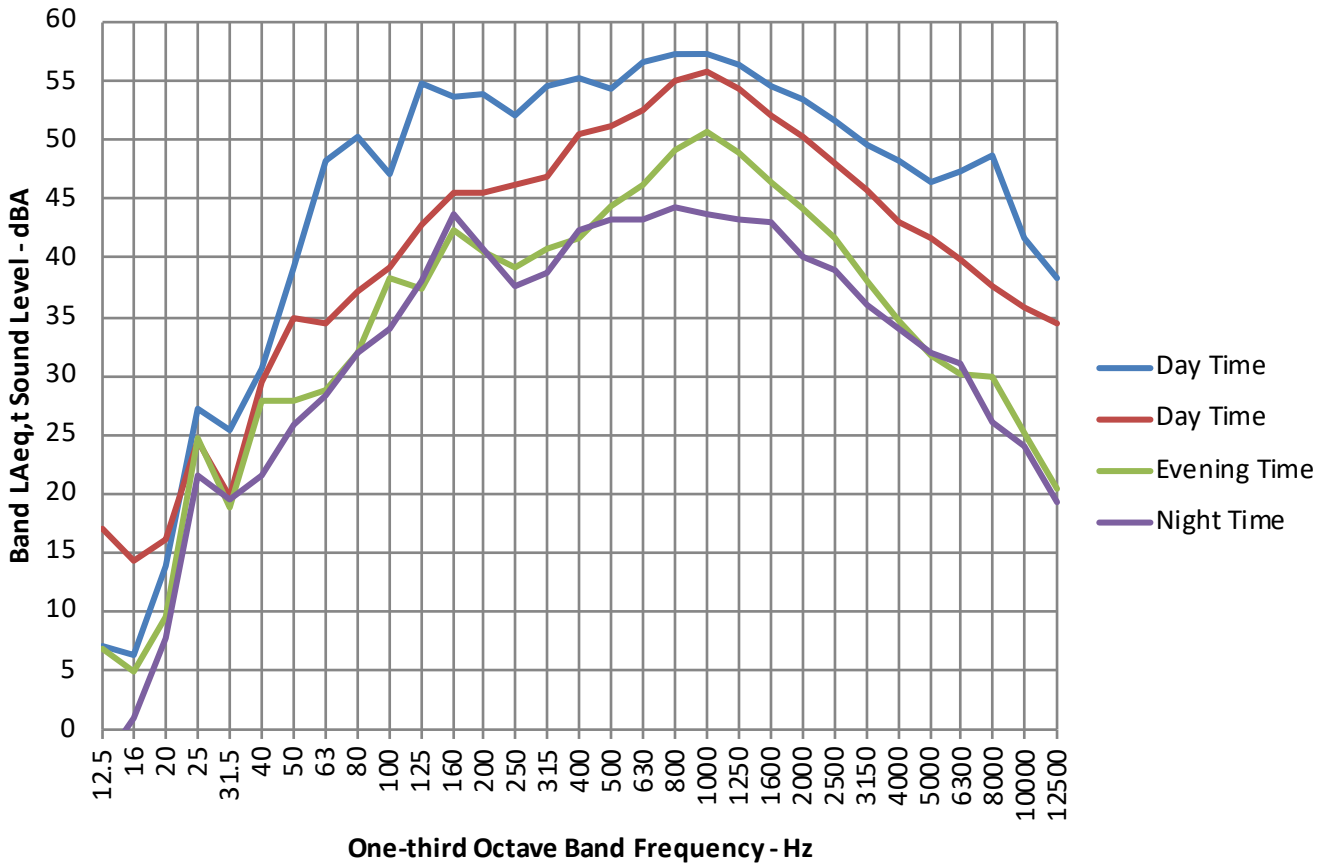


**Figure A55B: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Tonality Spectra 72 Taylor Ave**

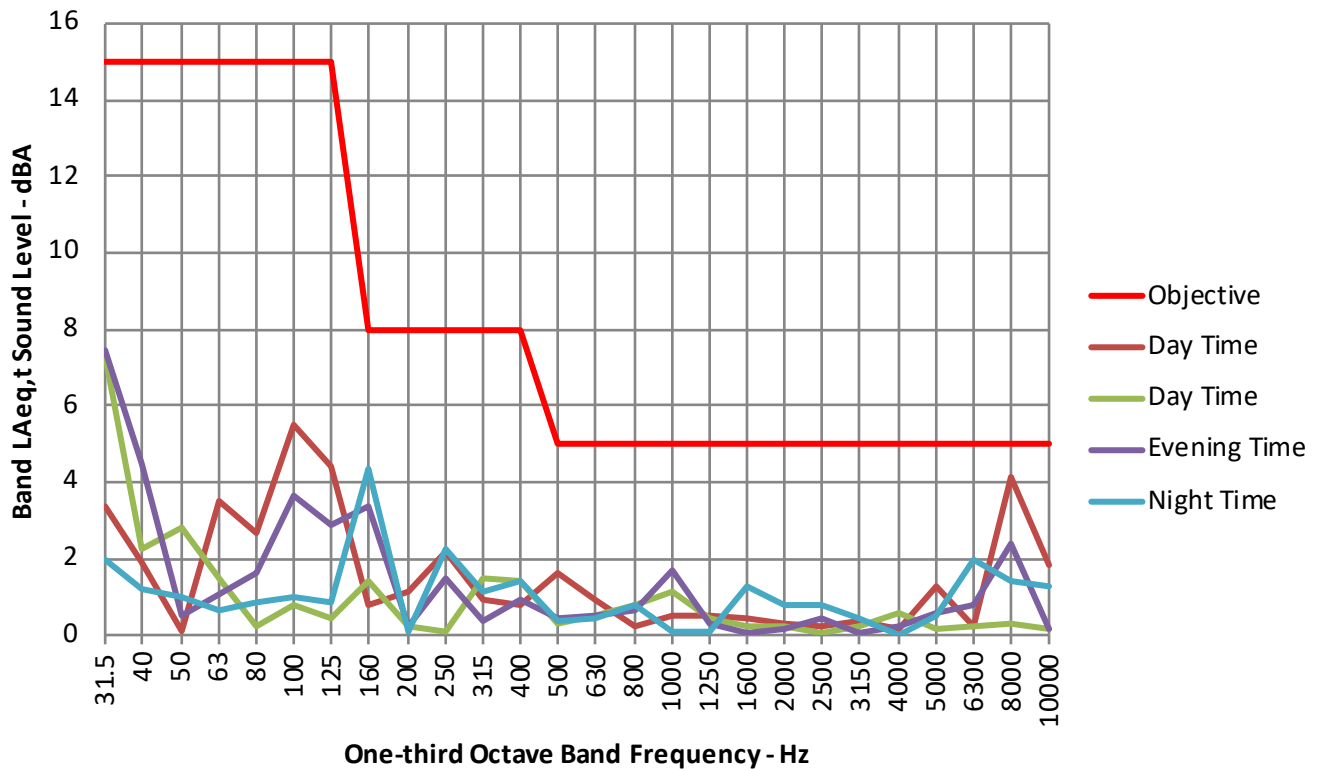


**Figure A56A: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**

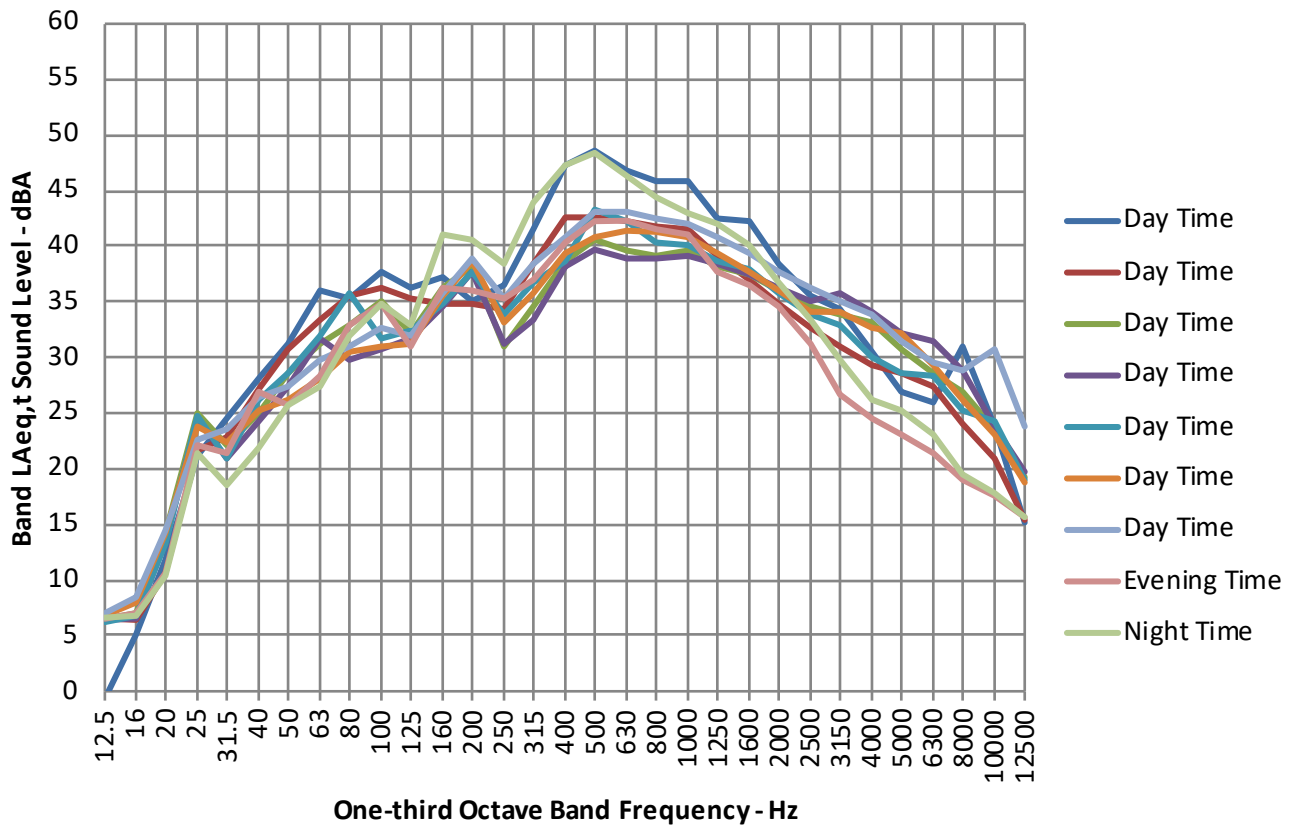


**Figure A56B: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Tonality Spectra North Fence**

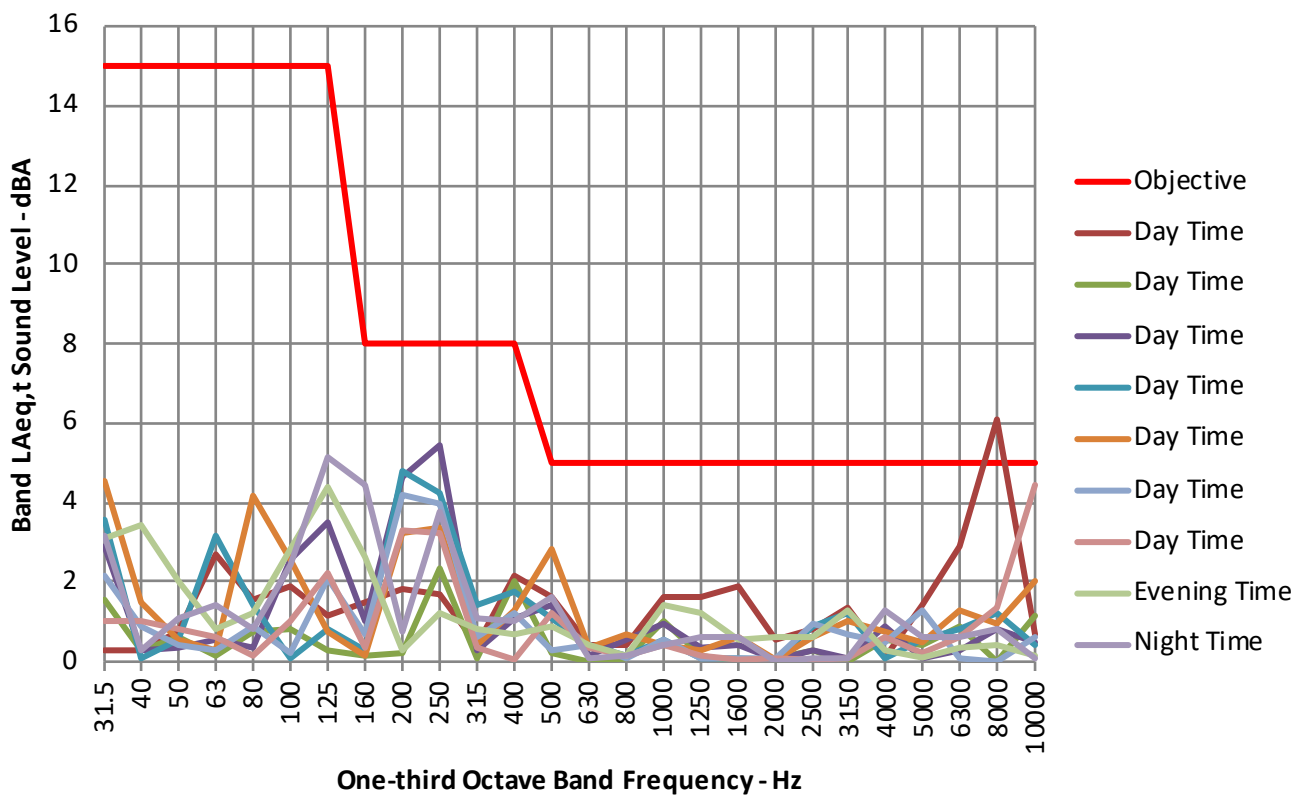


**Figure A57A: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

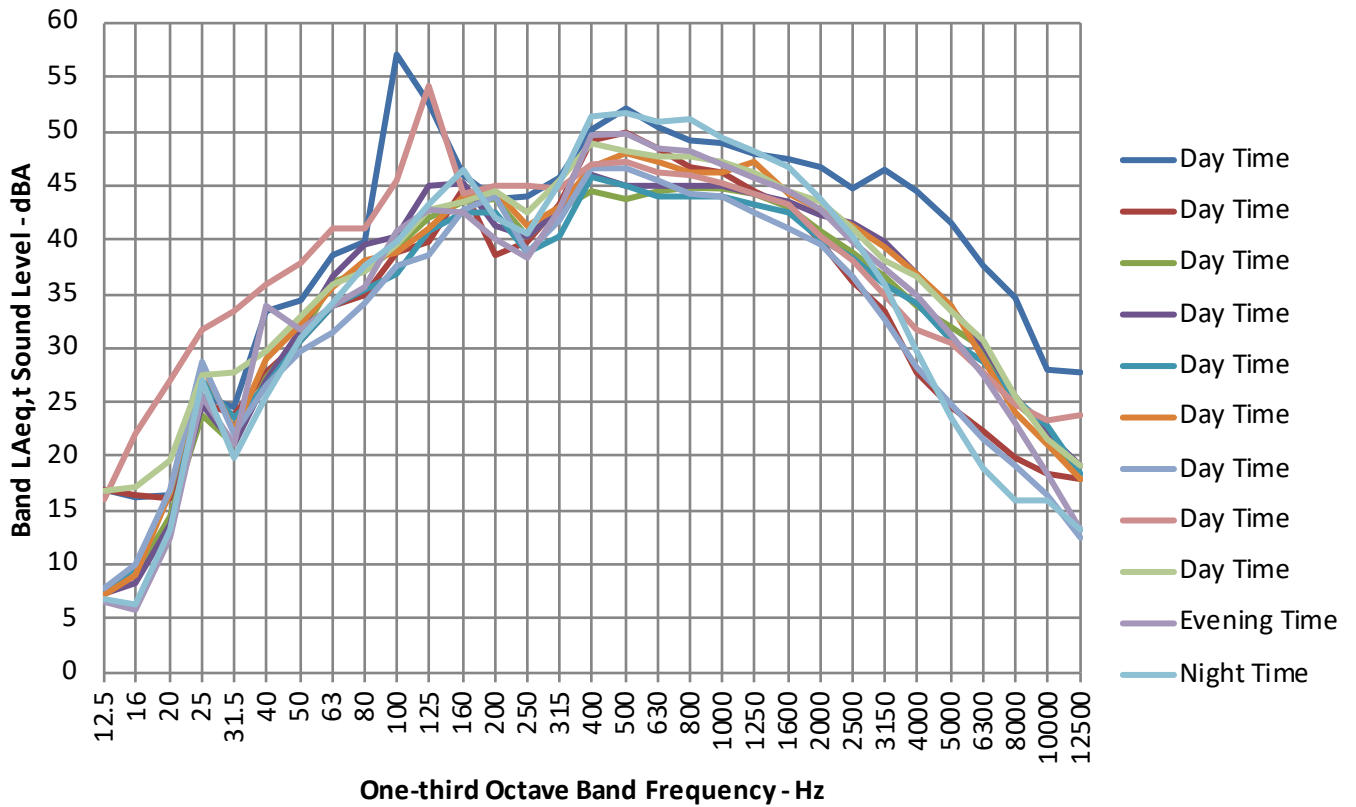


**Figure A57B: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Tonality Spectra Store Yard Close**

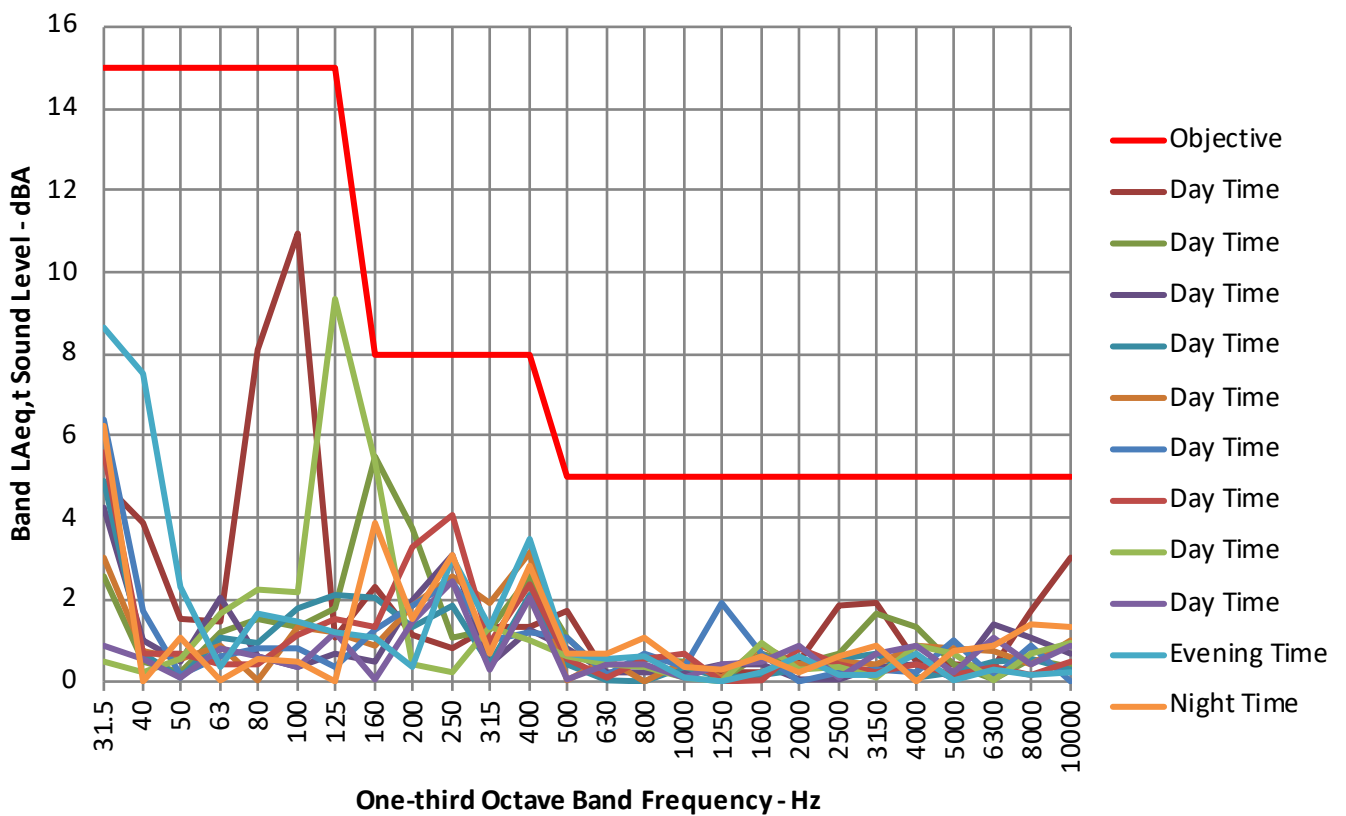


**Figure A58A: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 12 Brisbane St**



**Figure A58B: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Tonality Spectra 12 Brisbane St**

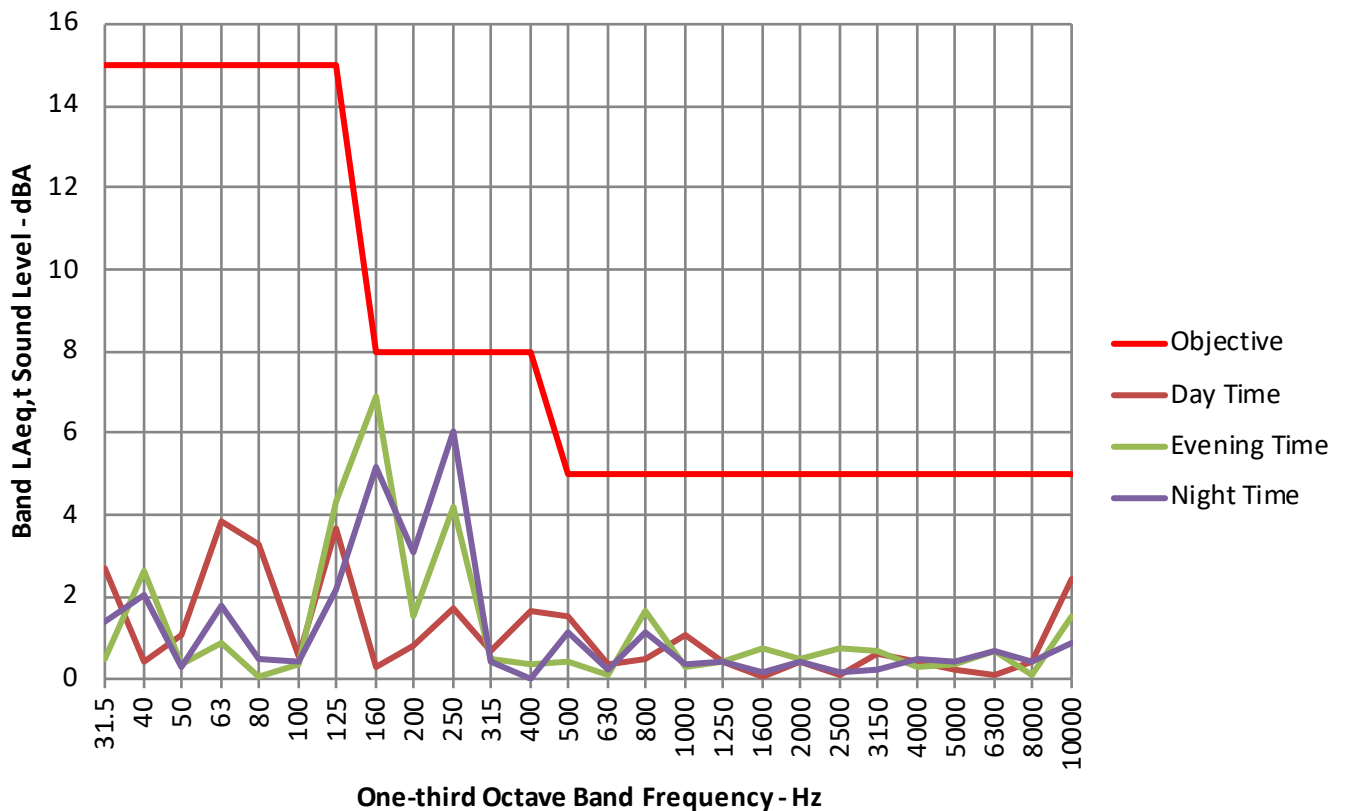


**Figure A59A: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Argyle St**



**Figure A59B: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Tonality Spectra Argyle St**

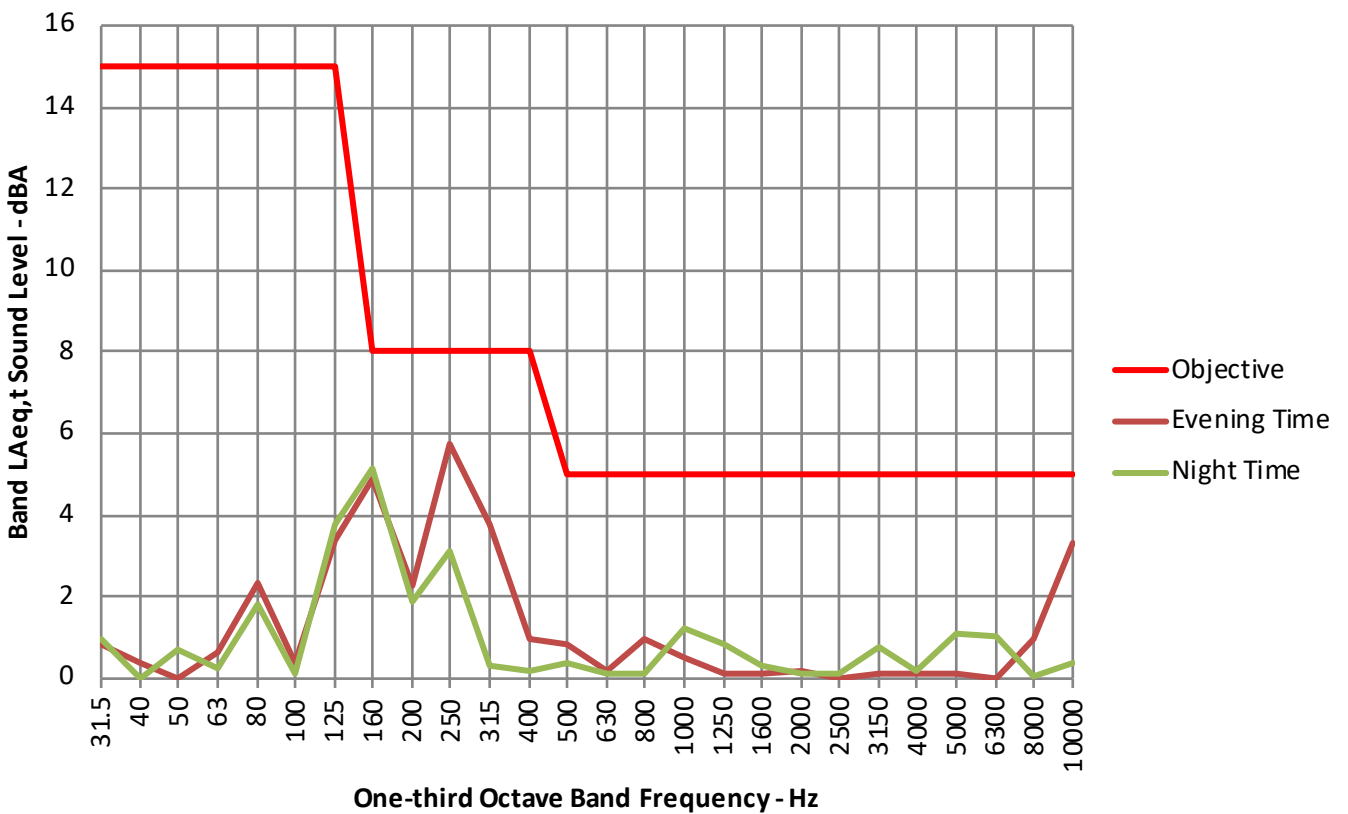


**Figure A60A: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 30 Adelaide St**

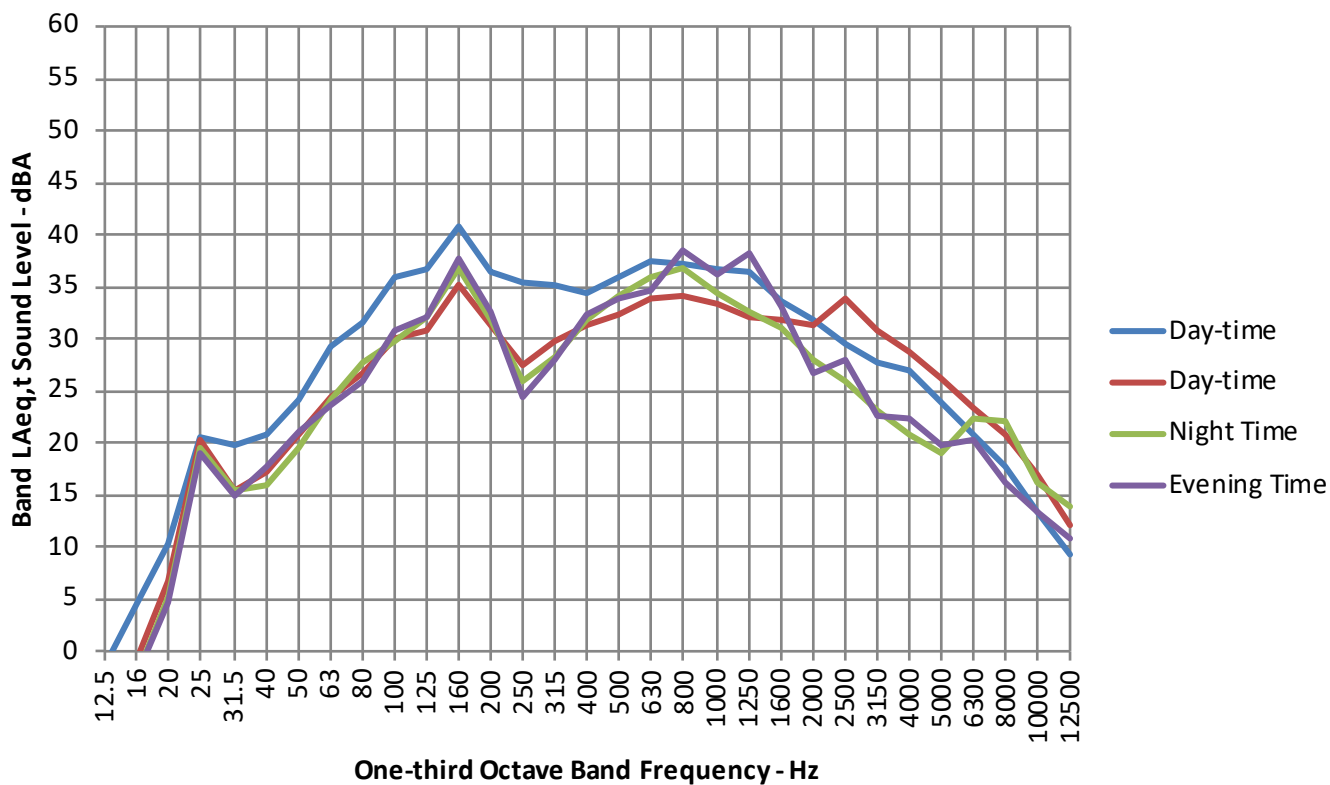


**Figure A60B: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Tonality Spectra 30 Adelaide St**

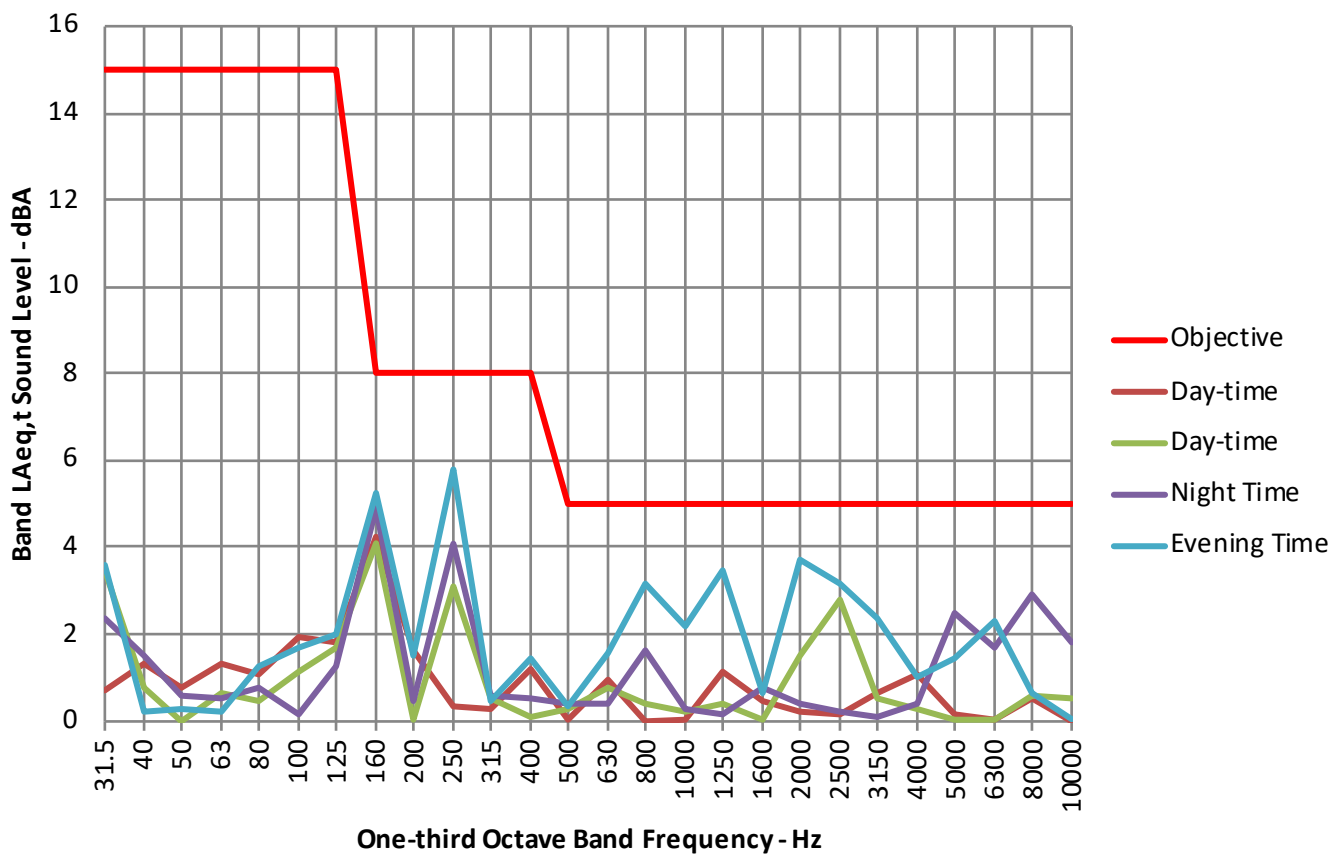


**Figure A61 :Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 4 Melbourne St**



**Figure A62 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 4 Melbourne St**

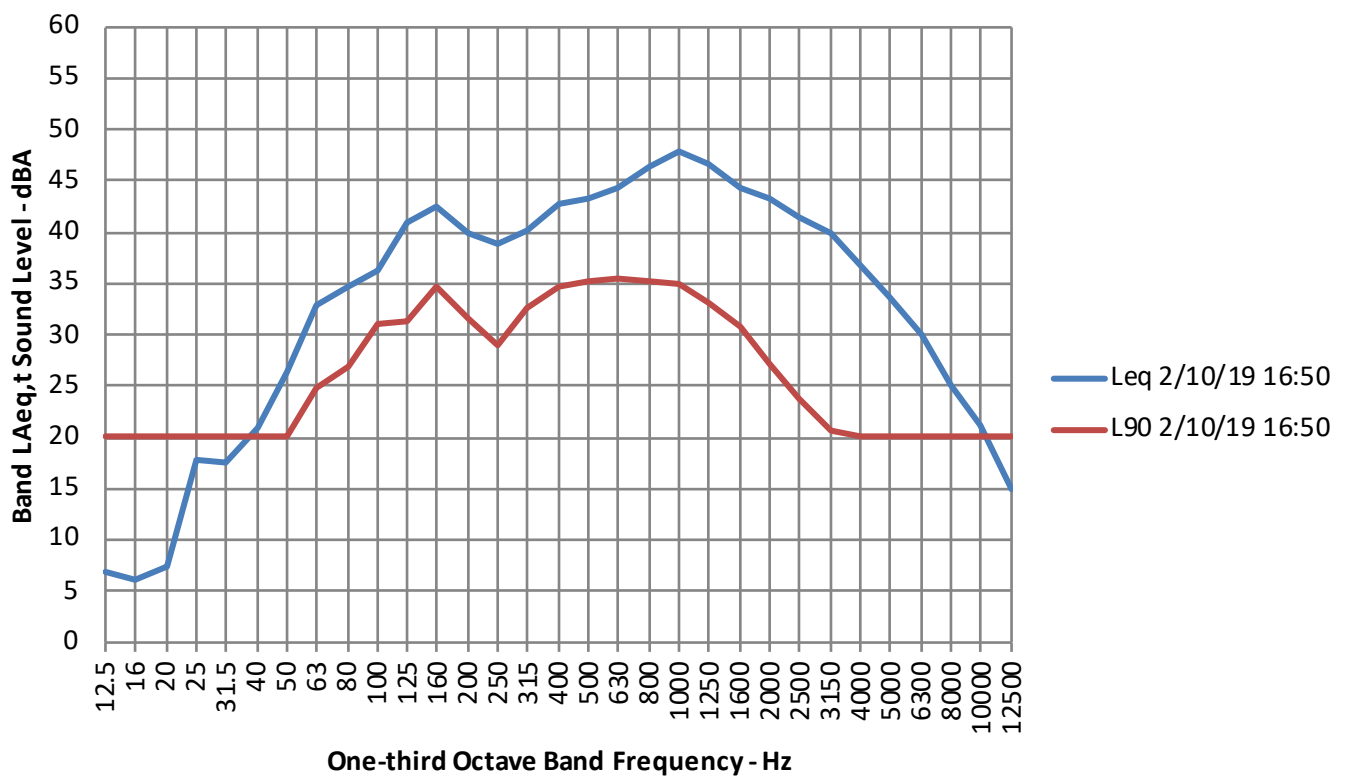


**Figure A63 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 4 Melbourne St**

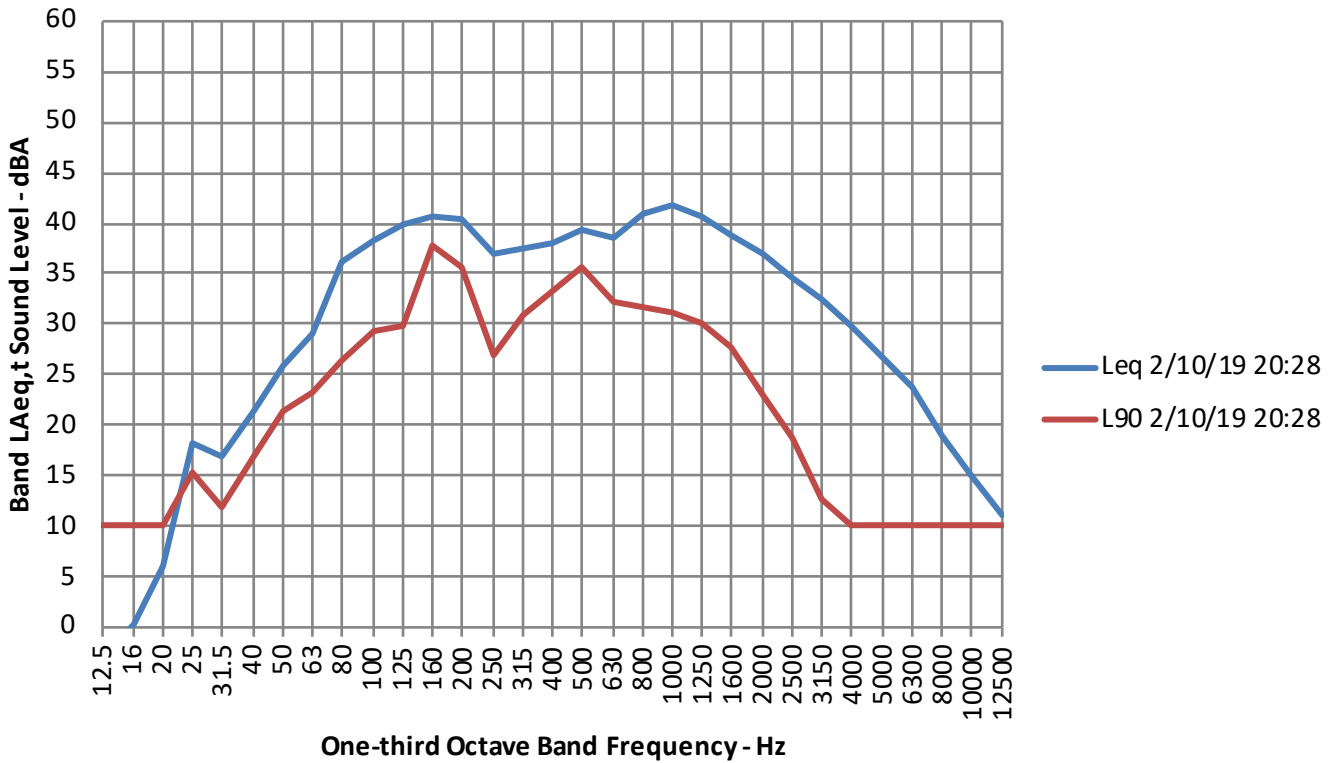


**Figure A64 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 4 Melbourne St**

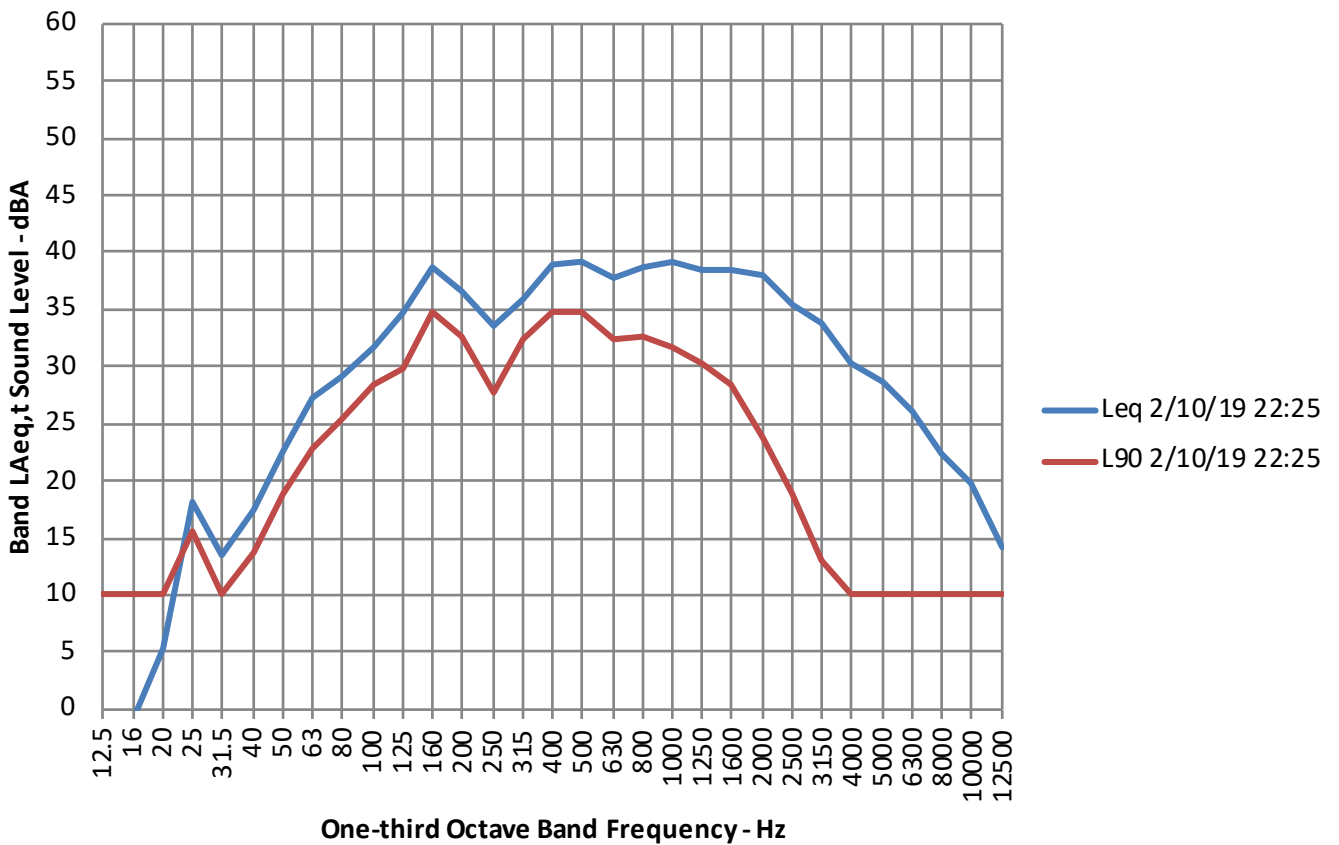


**Figure A65 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 72 Taylor Ave**

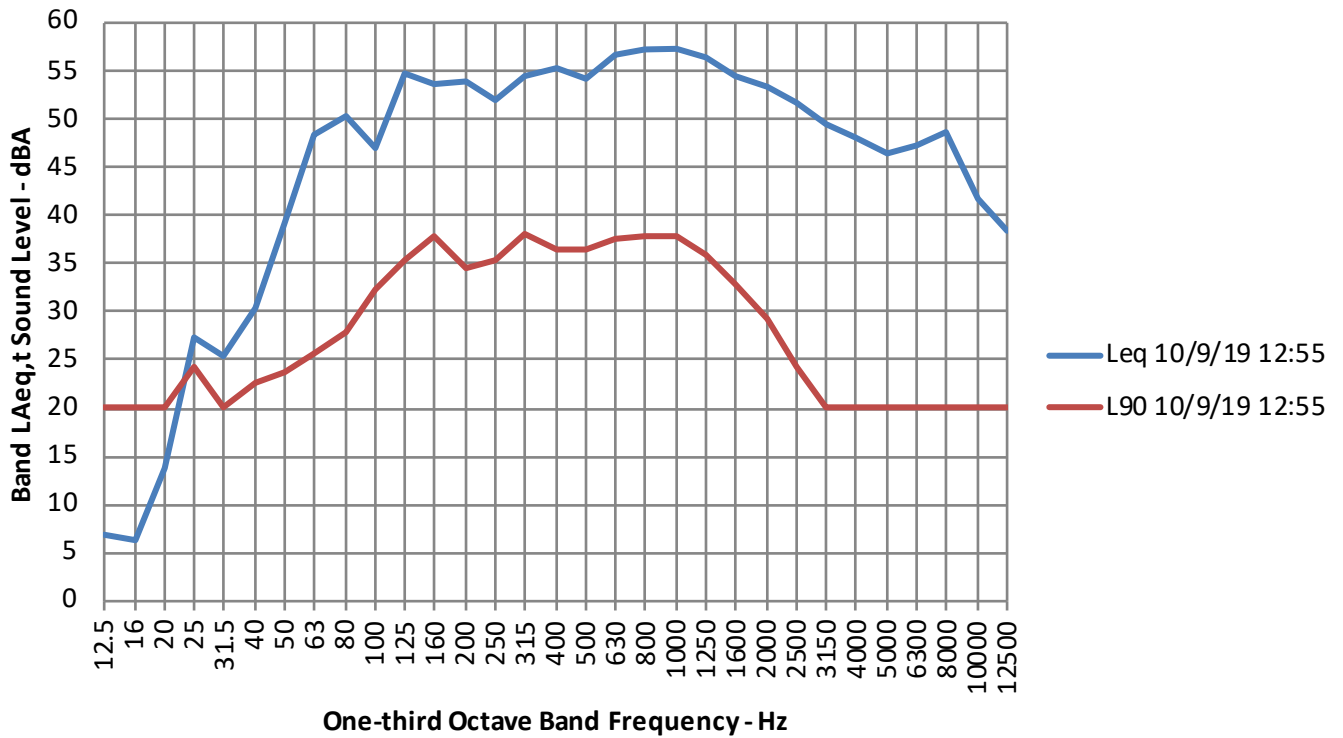


**Figure A66 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 72 Taylor Ave**

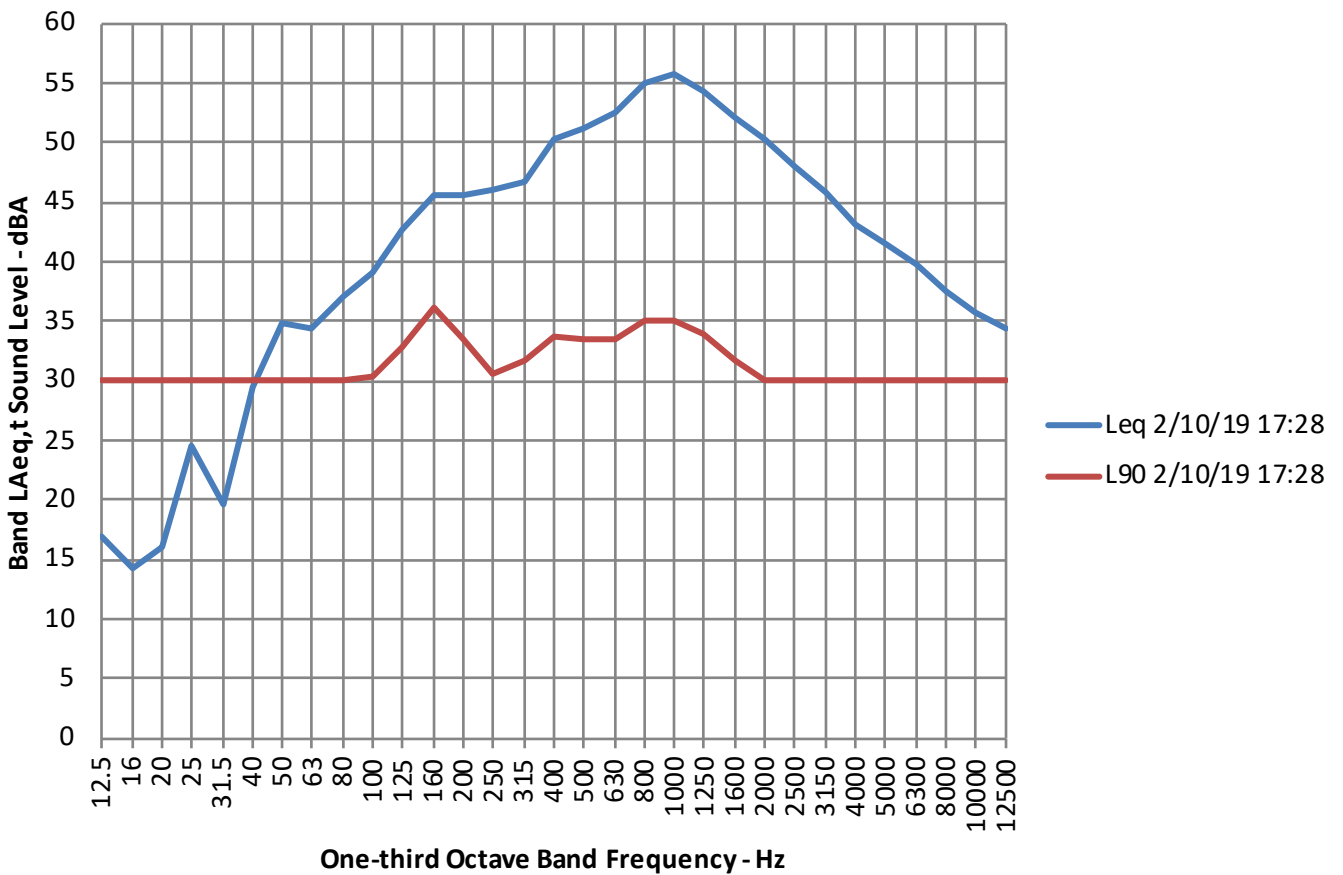


**Figure A67 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 72 Taylor Ave**

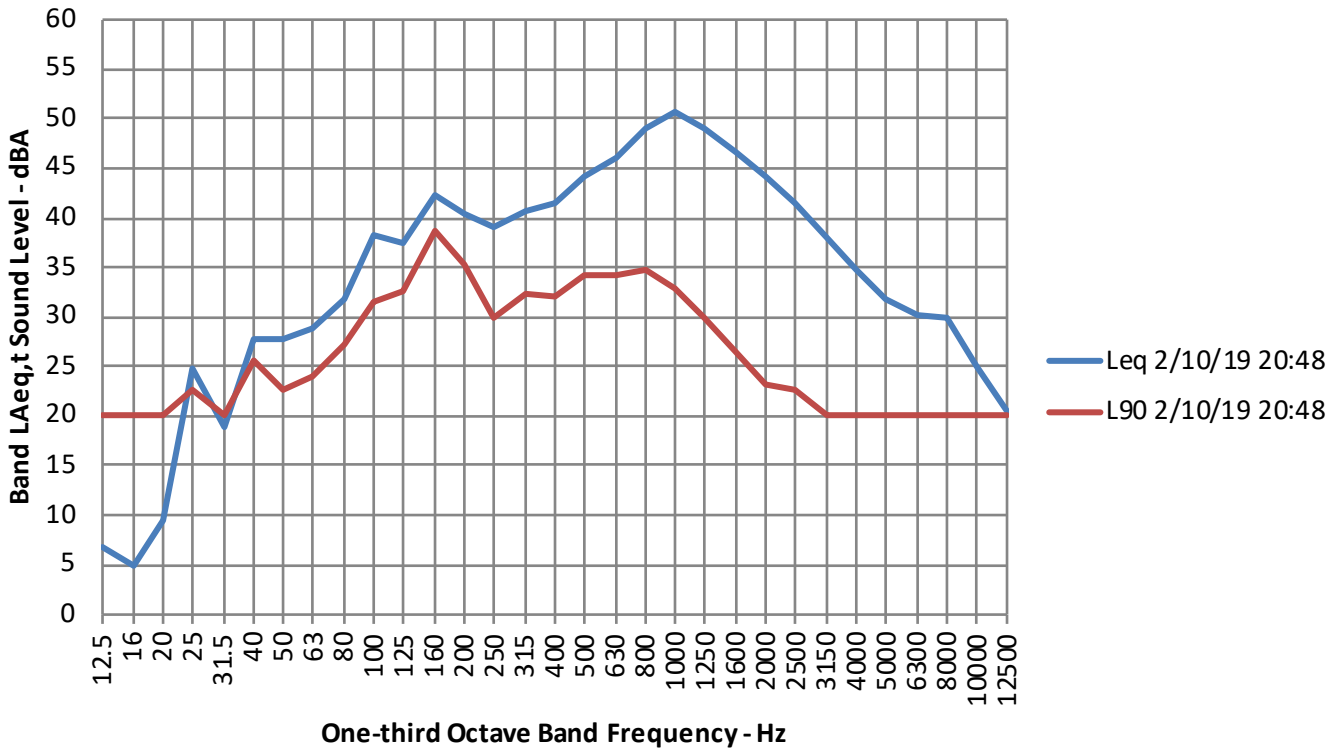


**Figure A68 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 72 Taylor Ave**

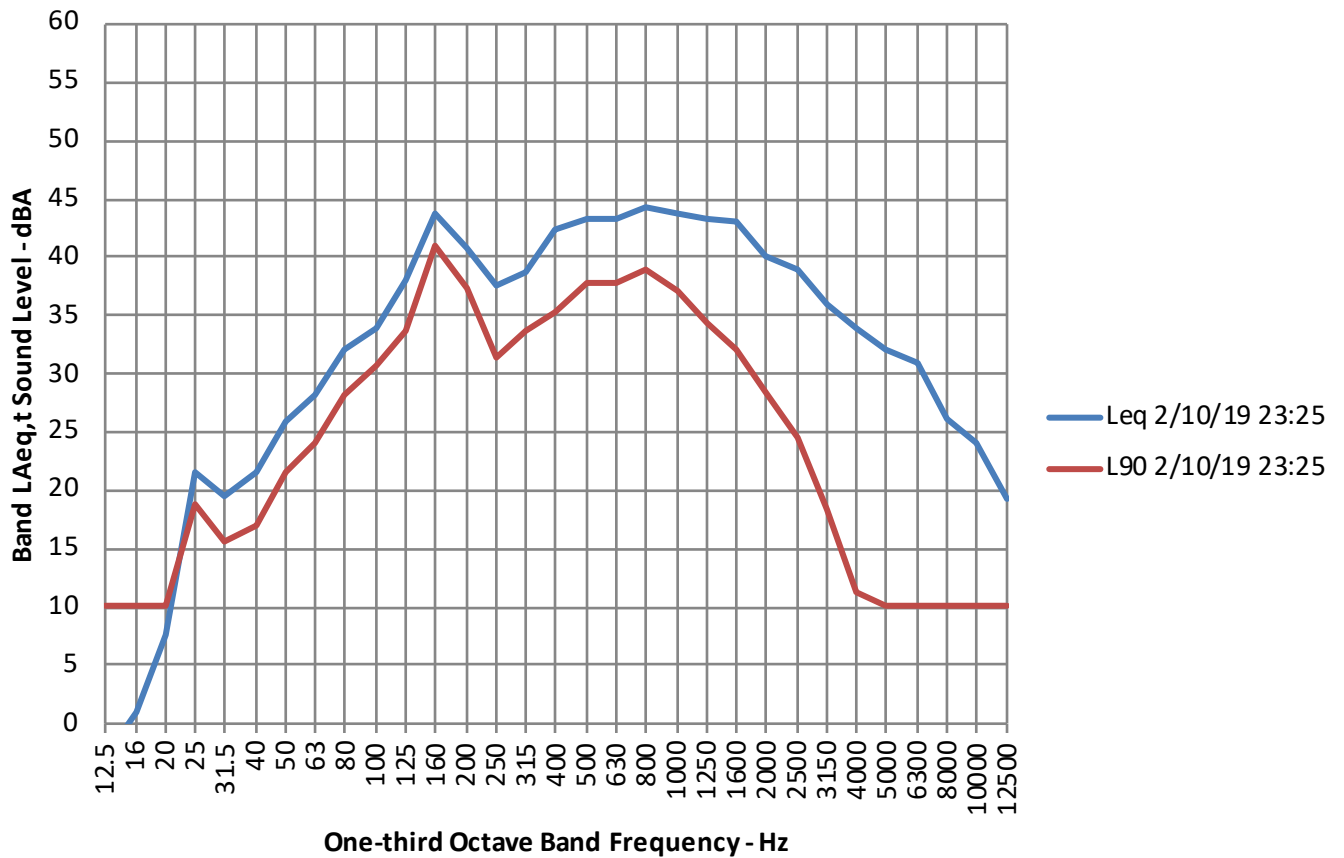


**Figure A69 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**

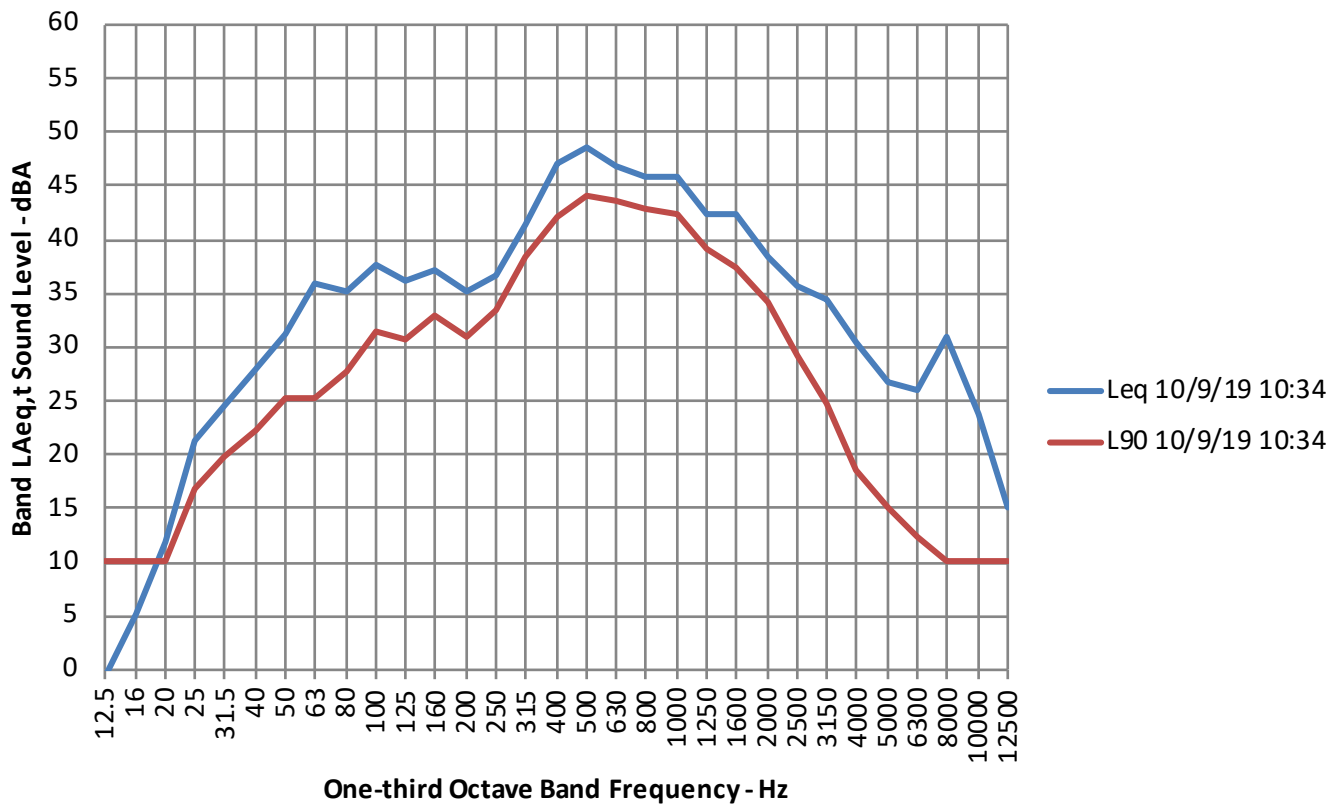


**Figure A70 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**

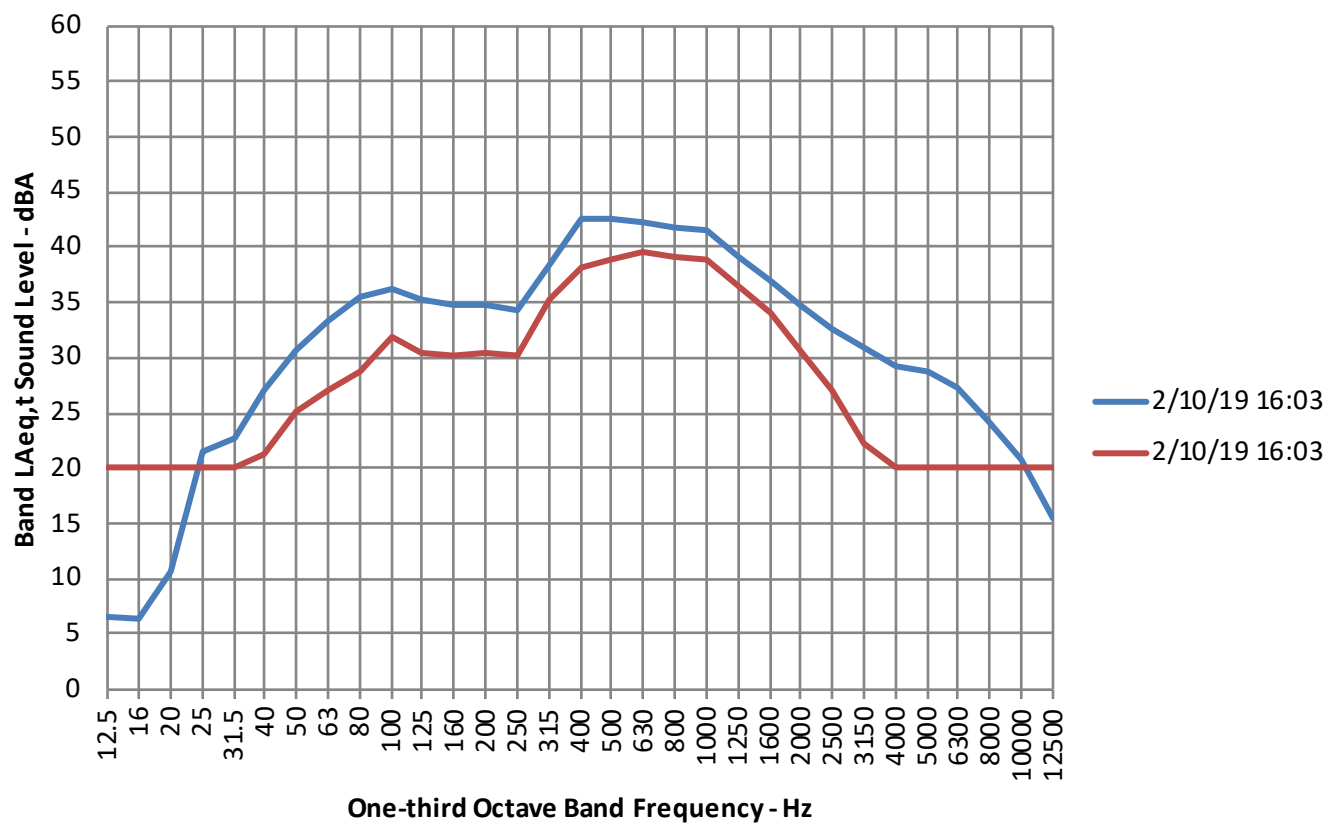


**Figure A71 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**



**Figure A72 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**

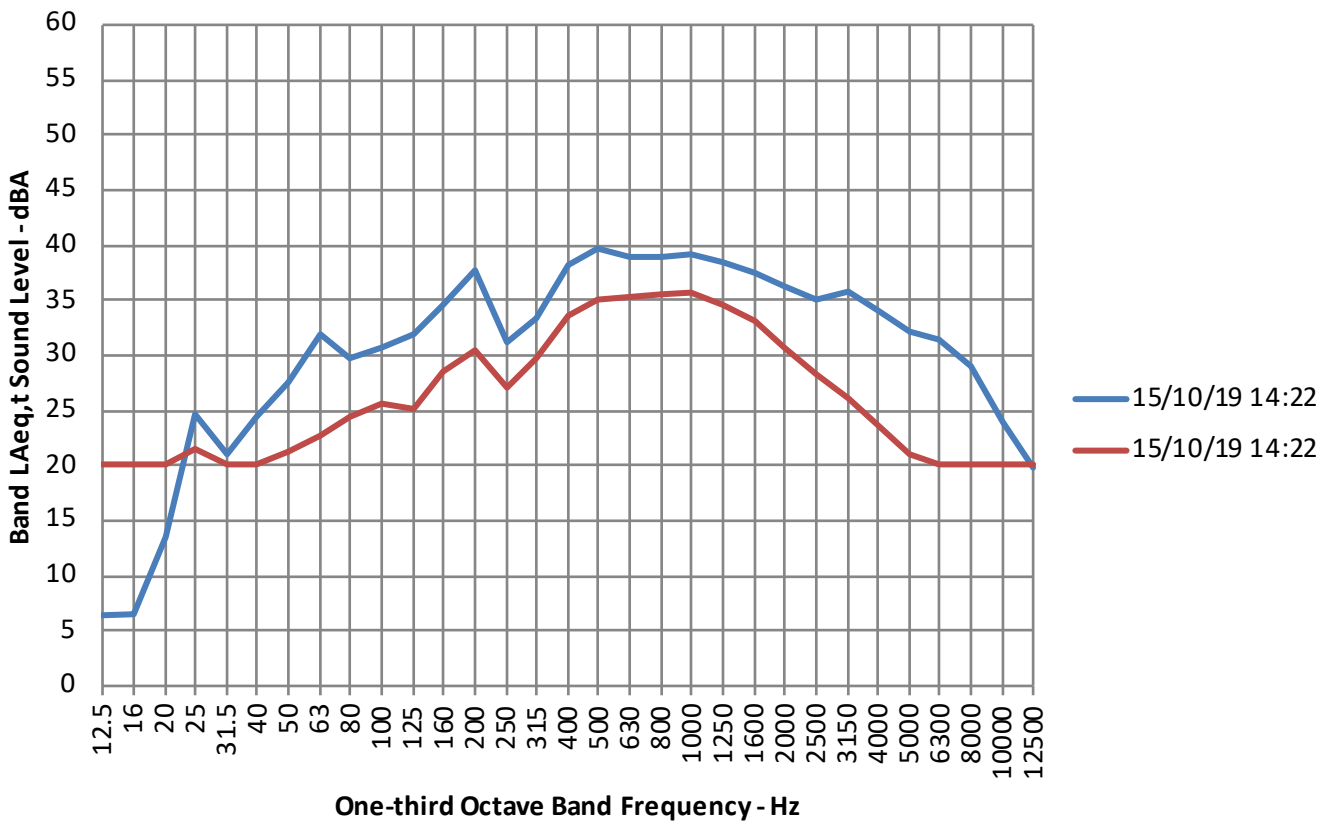


**Figure A73 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**

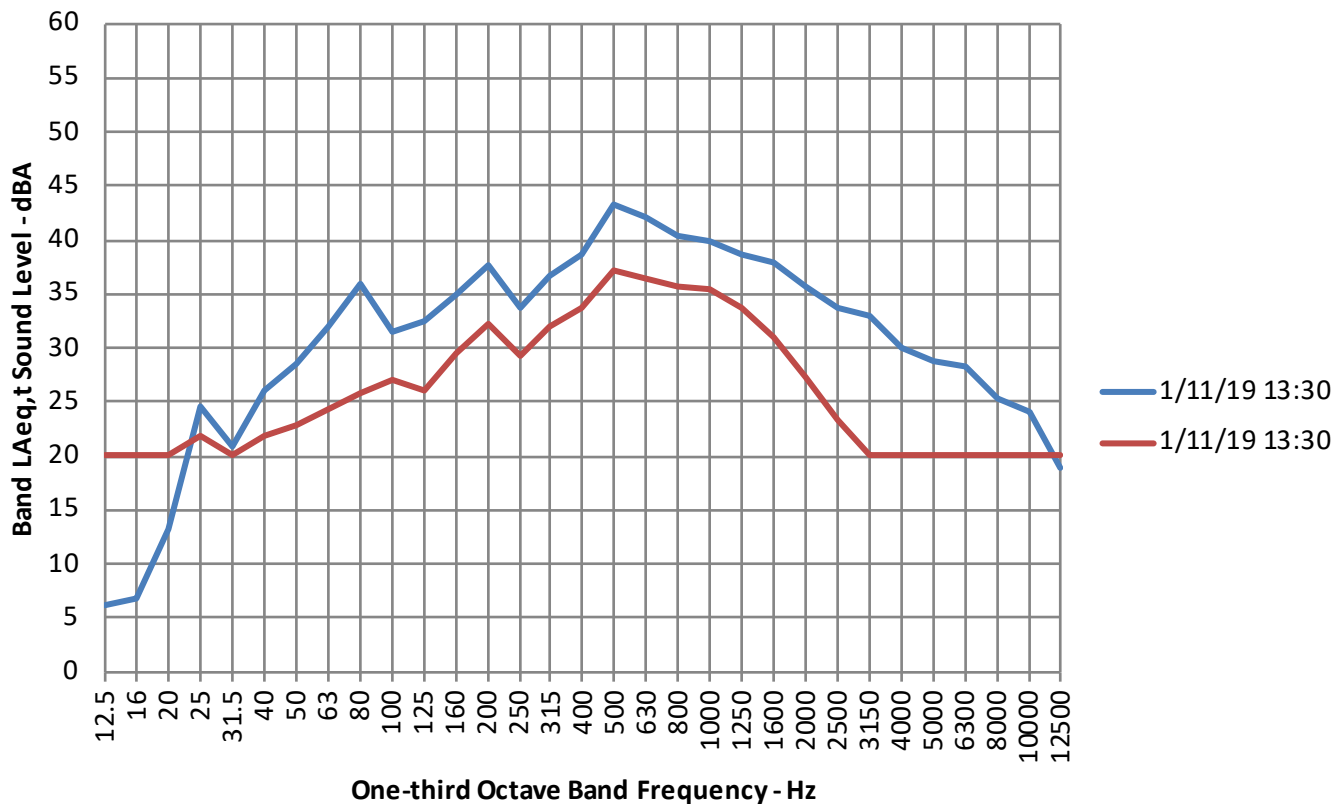


**Figure A74 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**



**Figure A75 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**

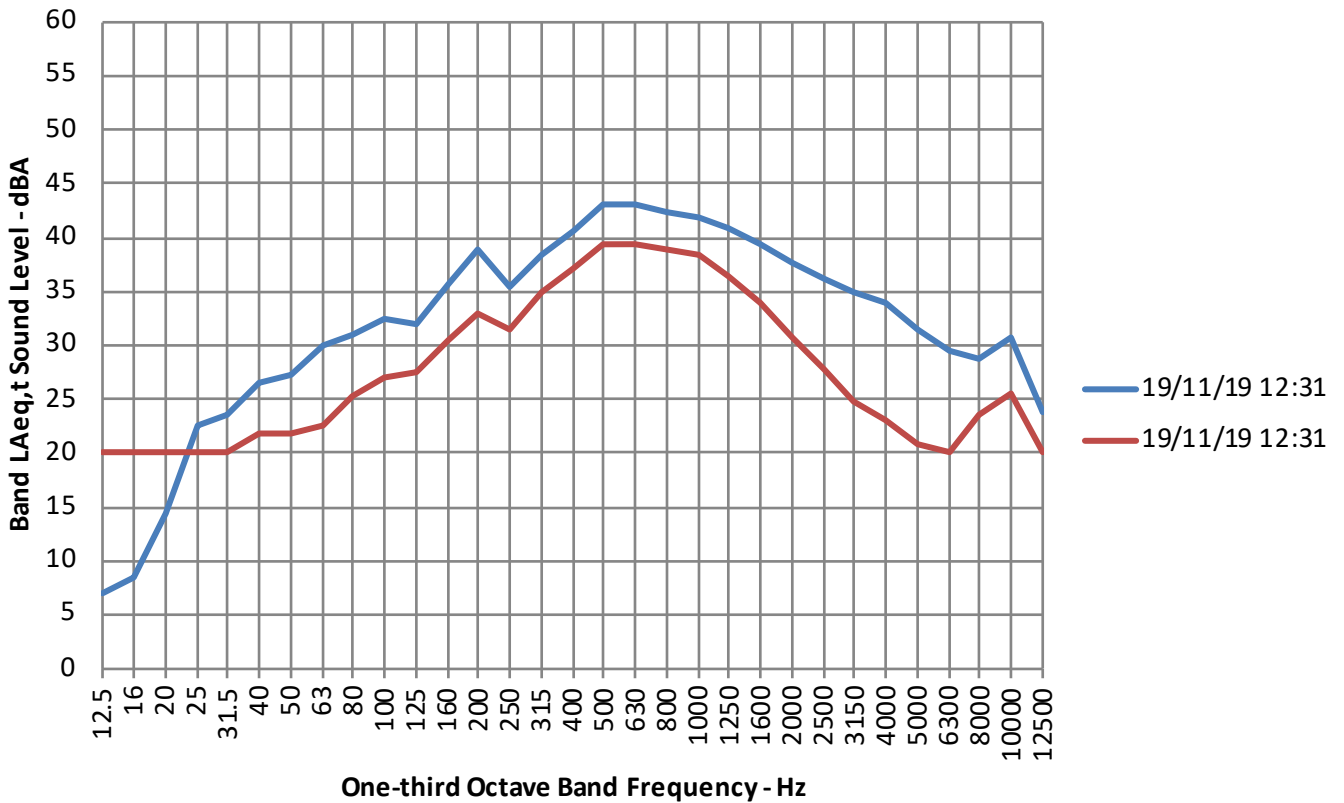


**Figure A76 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**

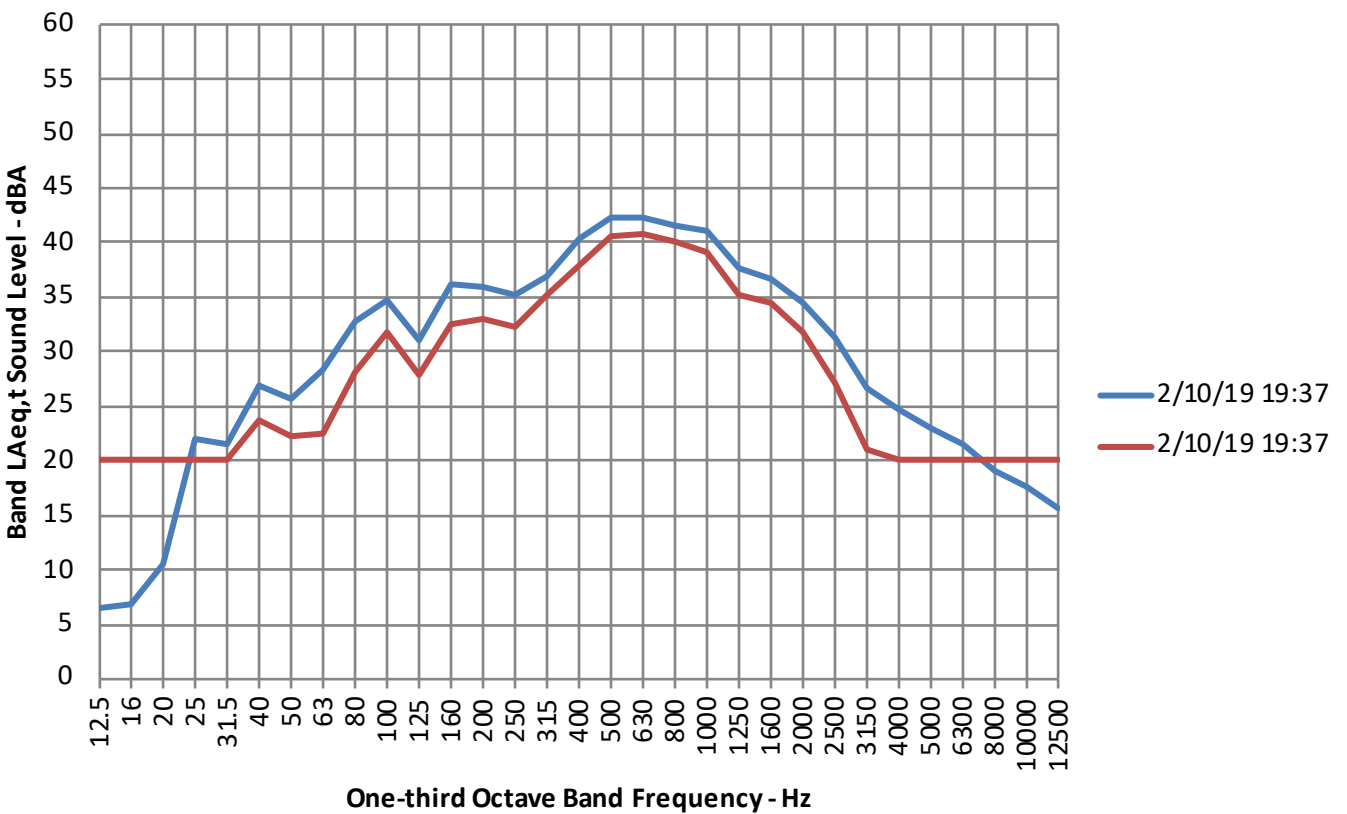


**Figure A77 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra North Fence**



**Figure A78 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

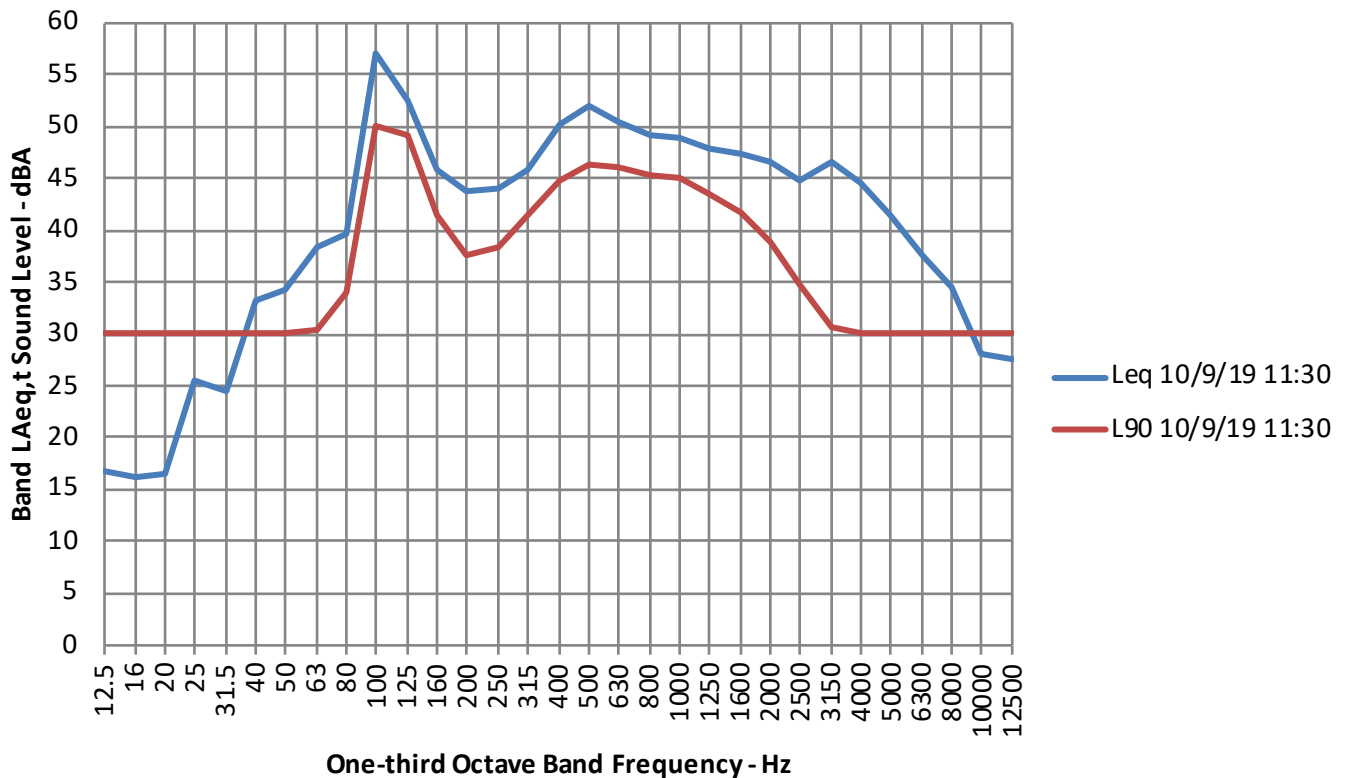


**Figure A79 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

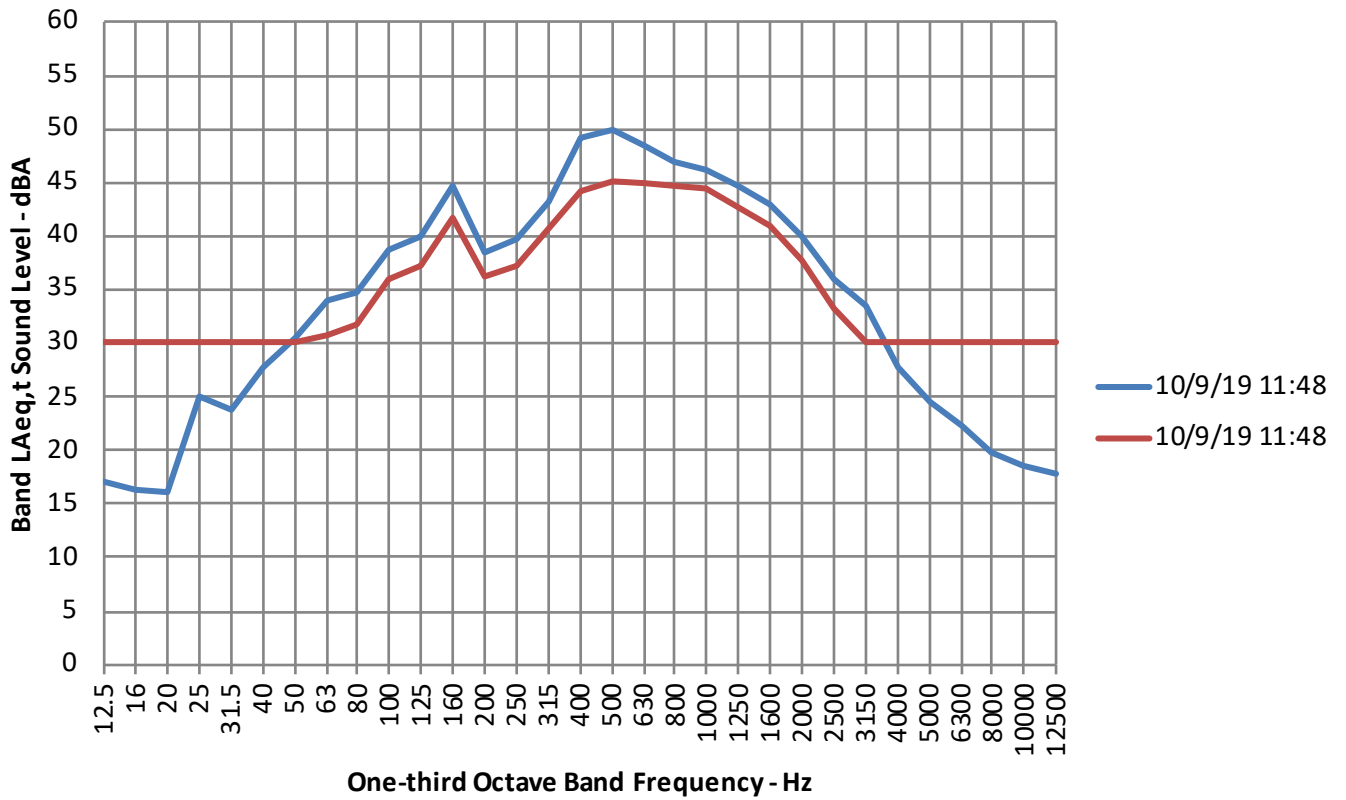


**Figure A80 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

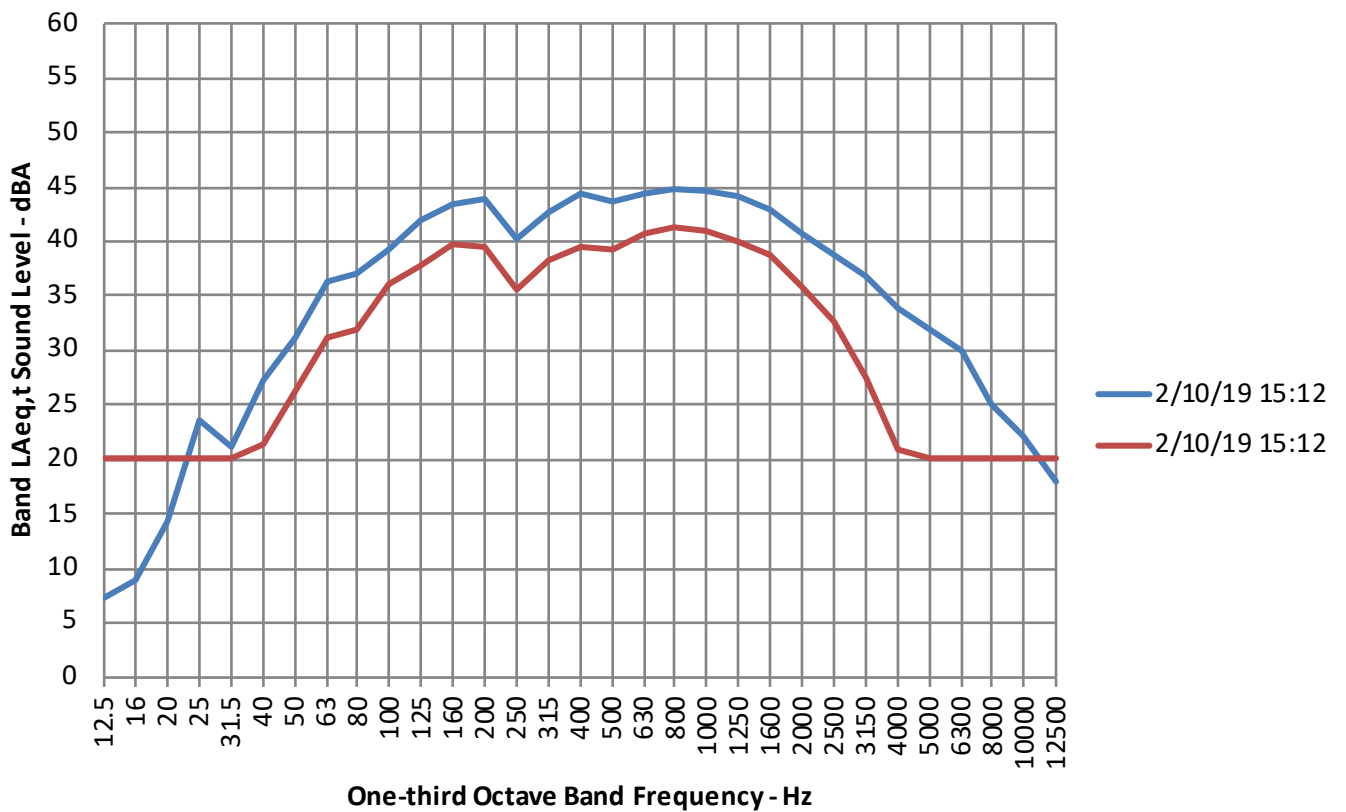


**Figure A81 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

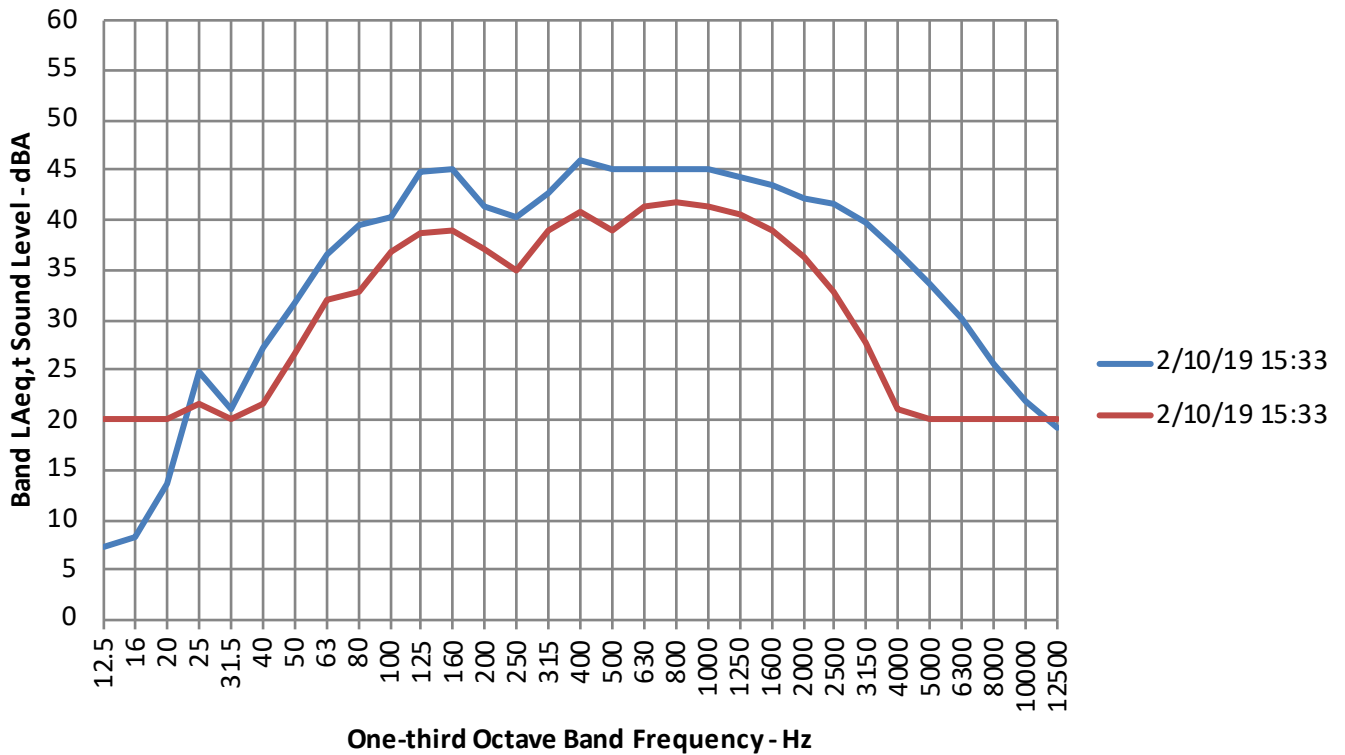


**Figure A82 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

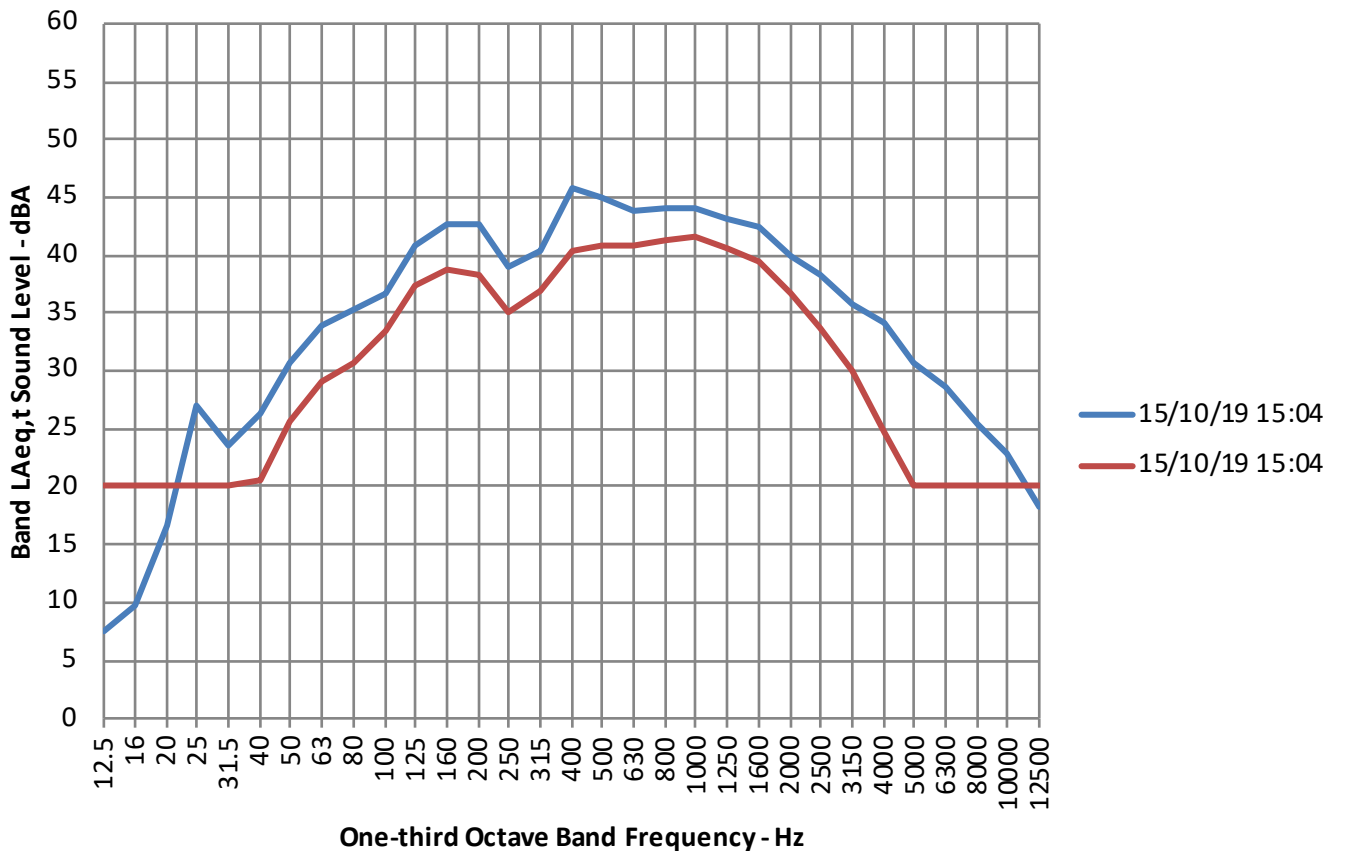


**Figure A83 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

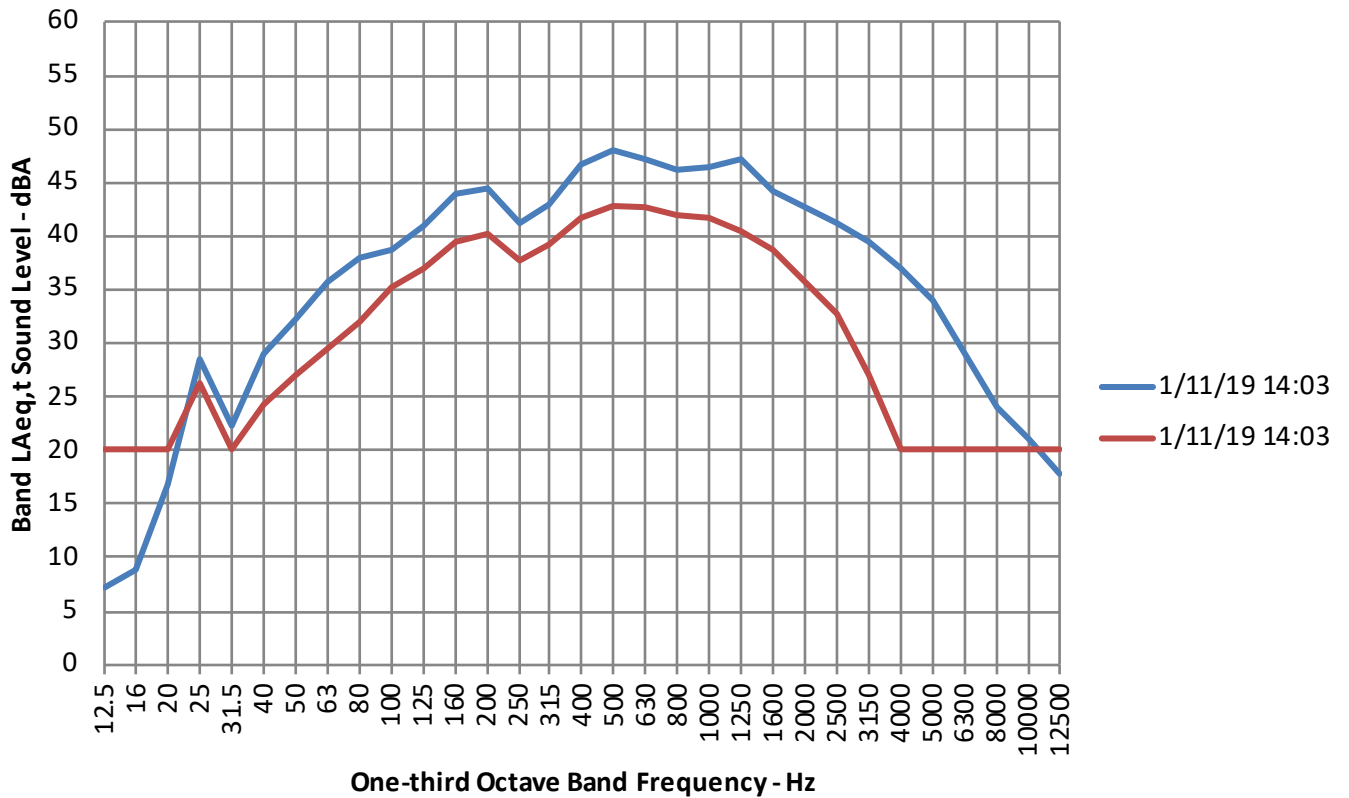


**Figure A84 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**



**Figure A86 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

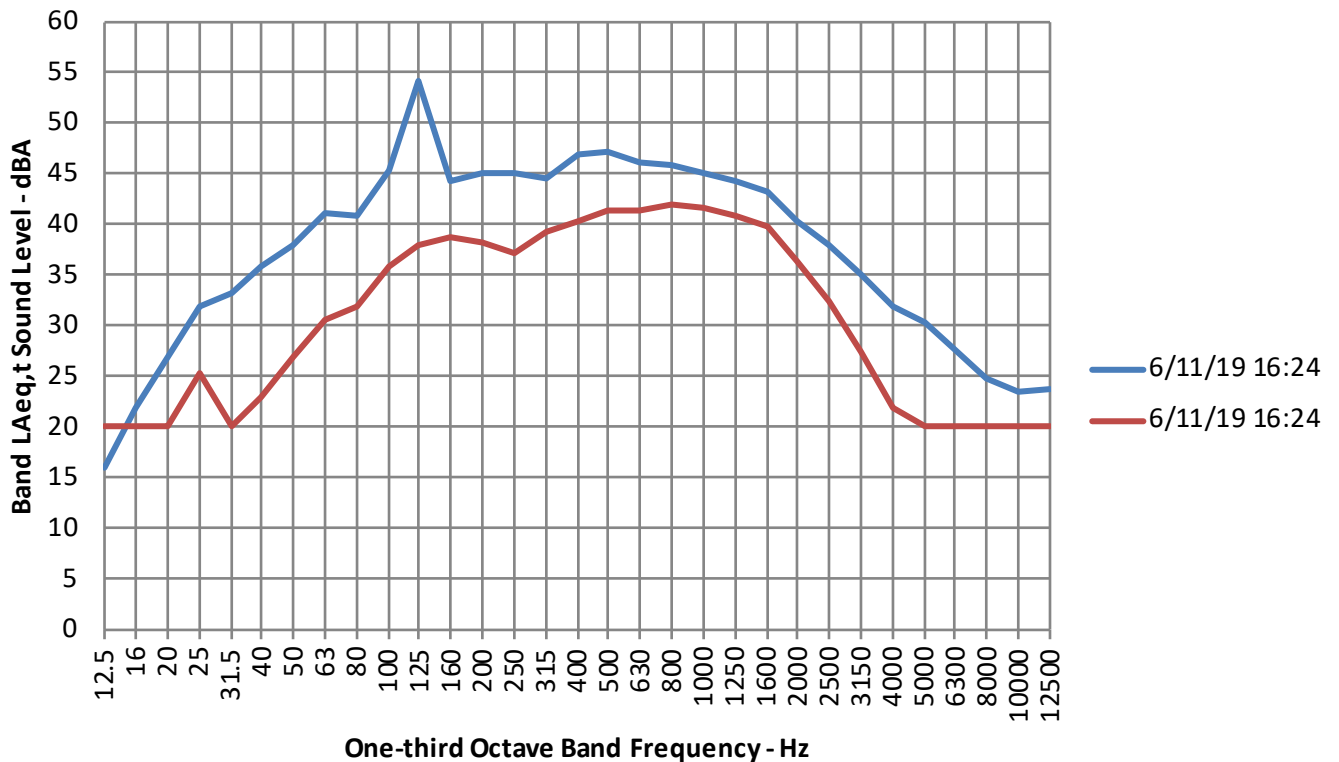


**Figure A87 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

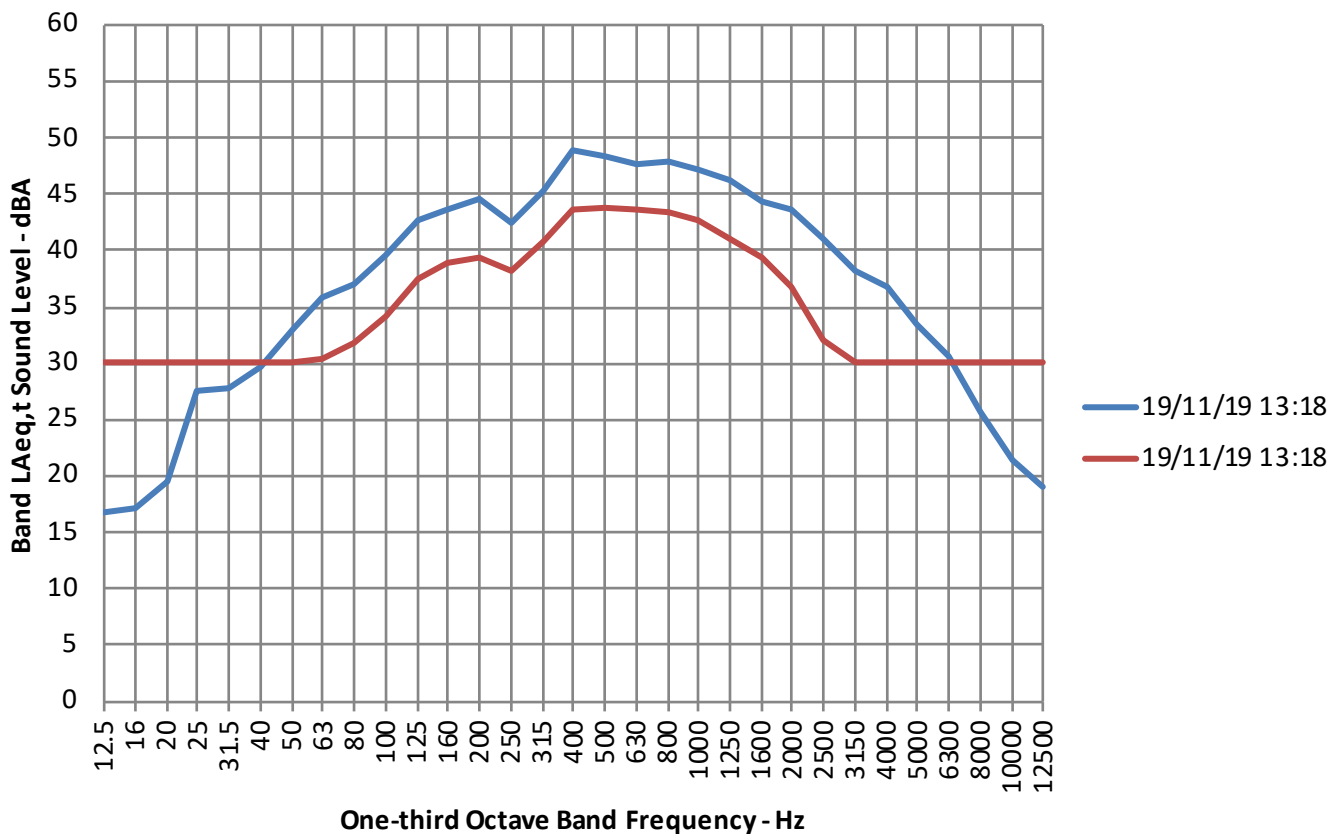


**Figure A88 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

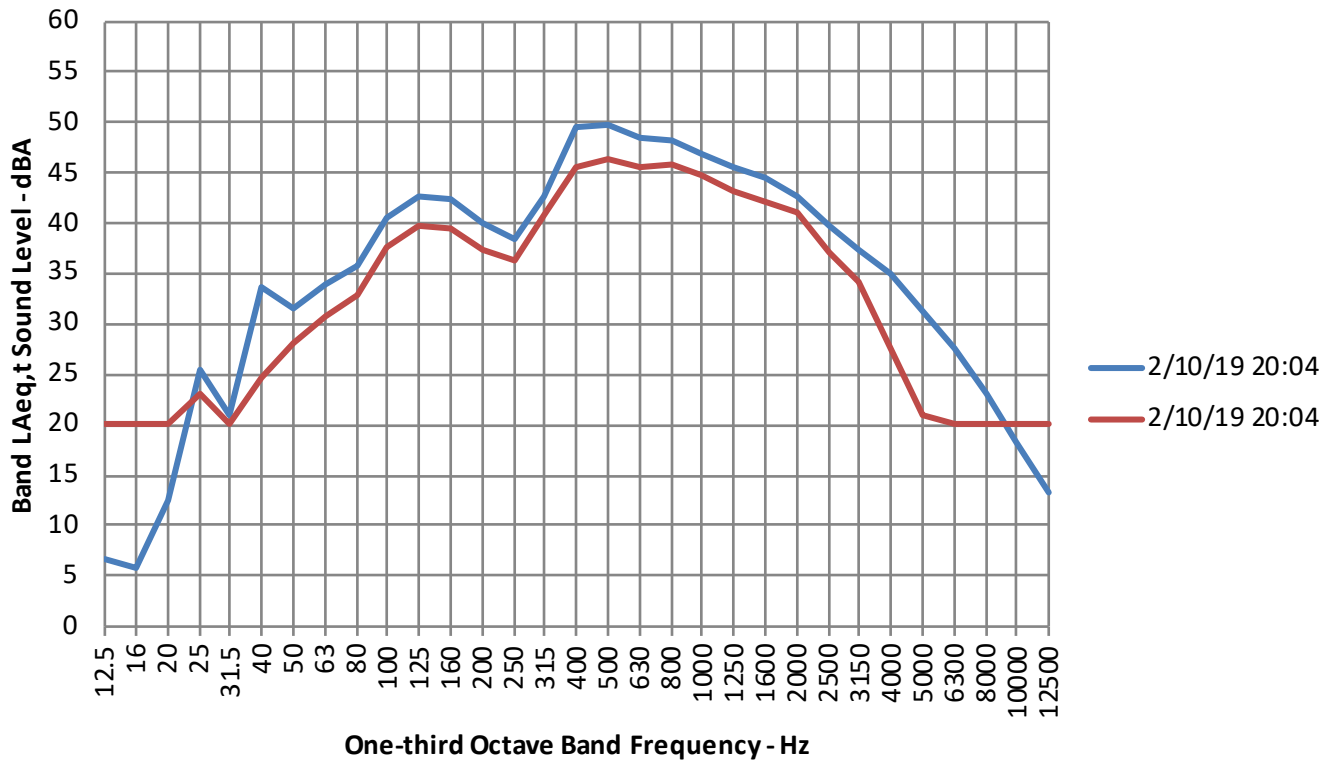


**Figure A89: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Store Yard Close**

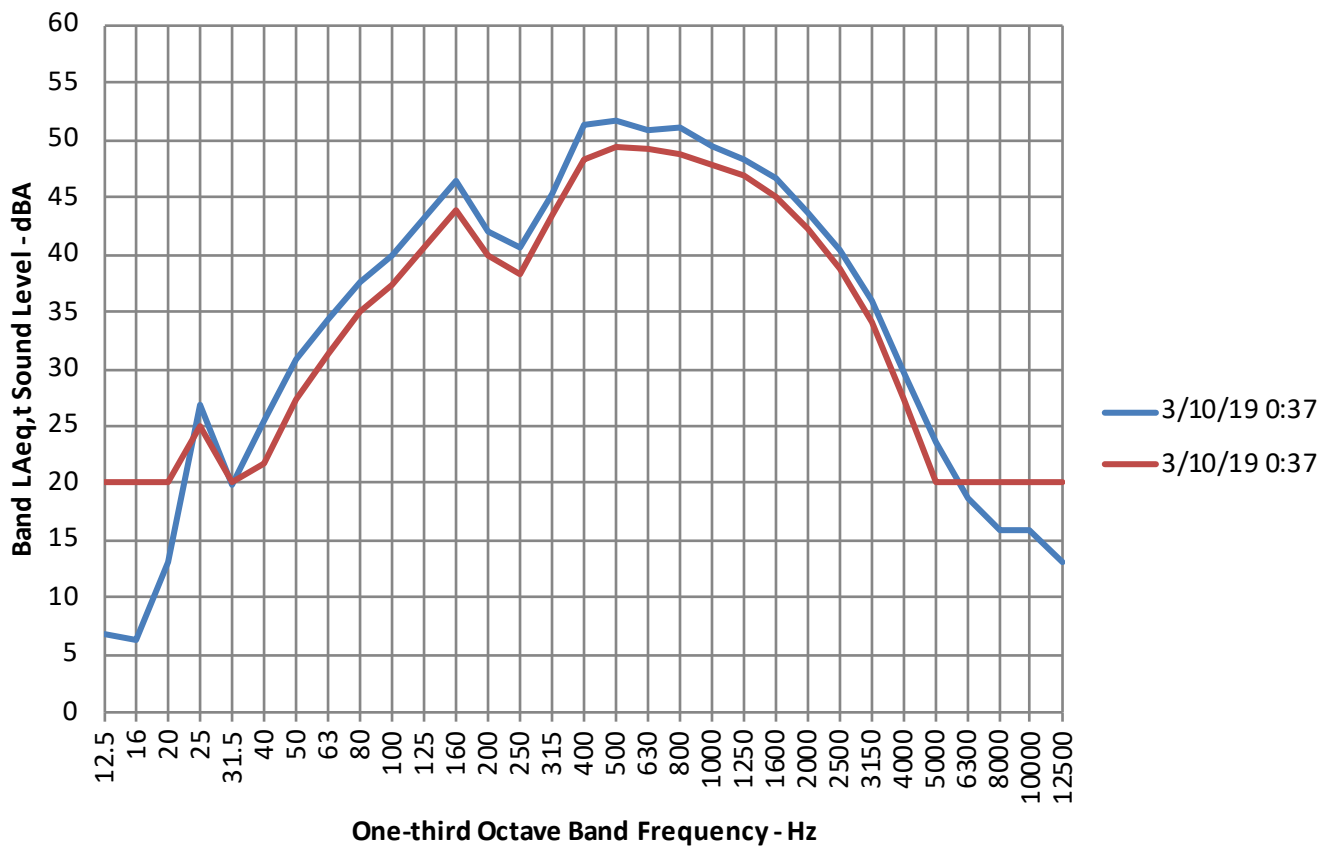


**Figure A90: Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 12 Brisbane St**



**Figure A91 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 12 Brisbane St**

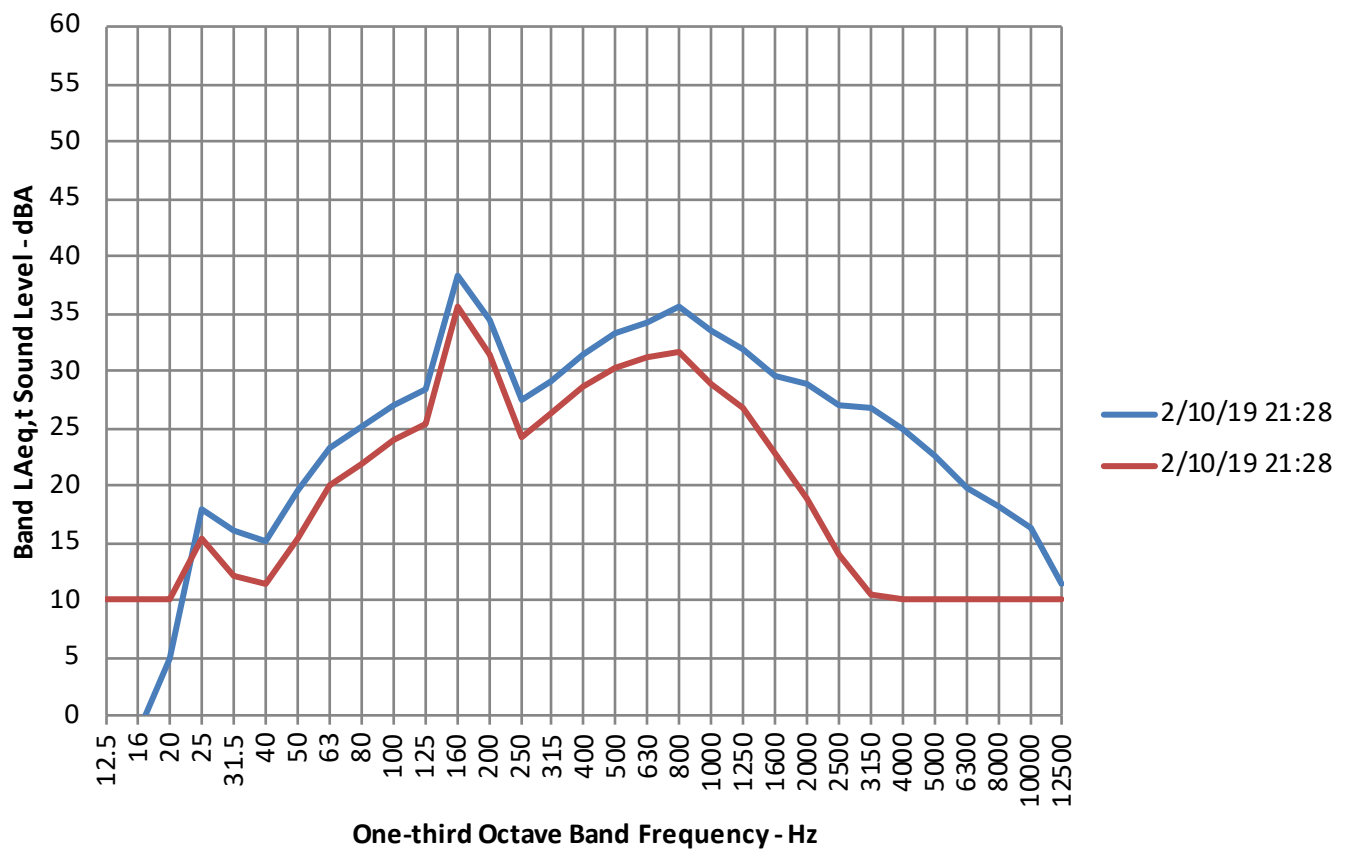


**Figure A92 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 12 Brisbane St**

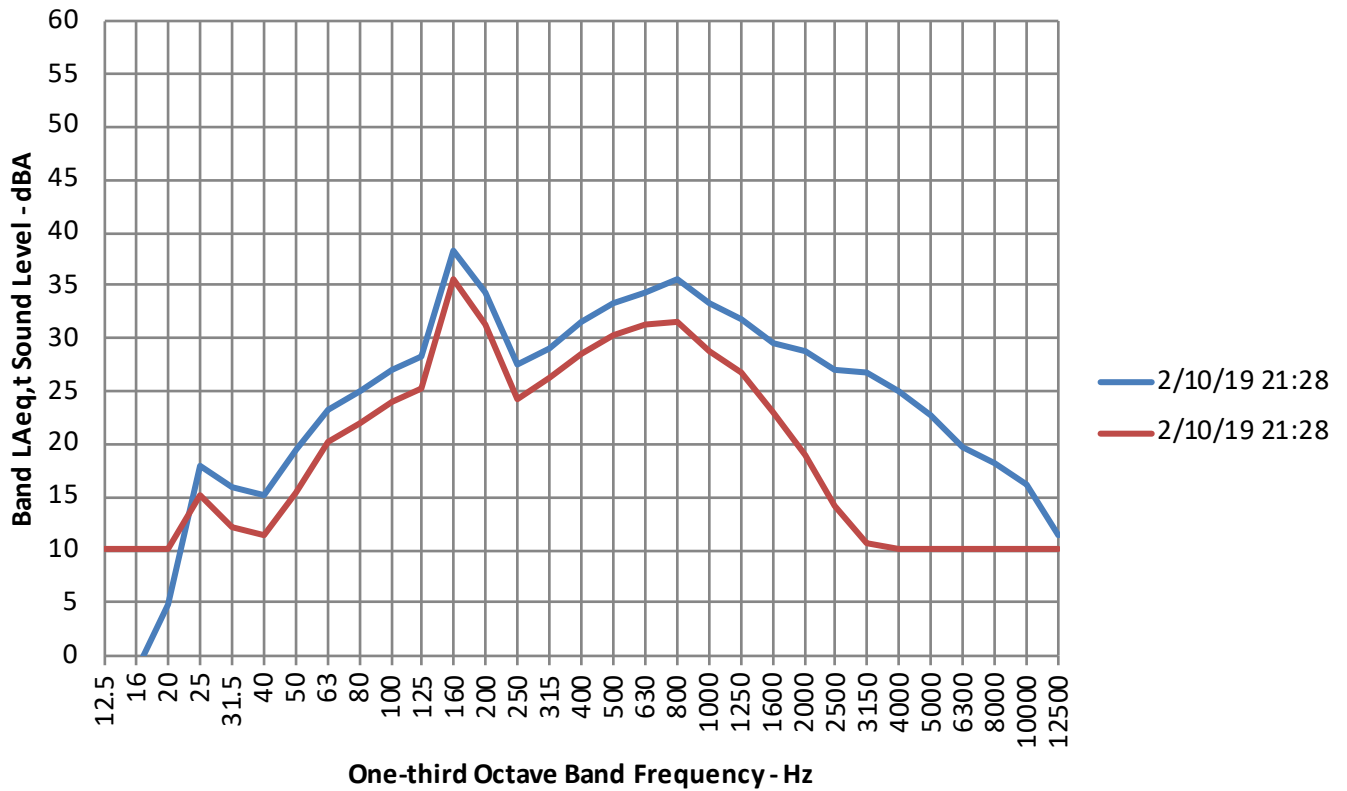


**Figure A93 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 12 Brisbane St**

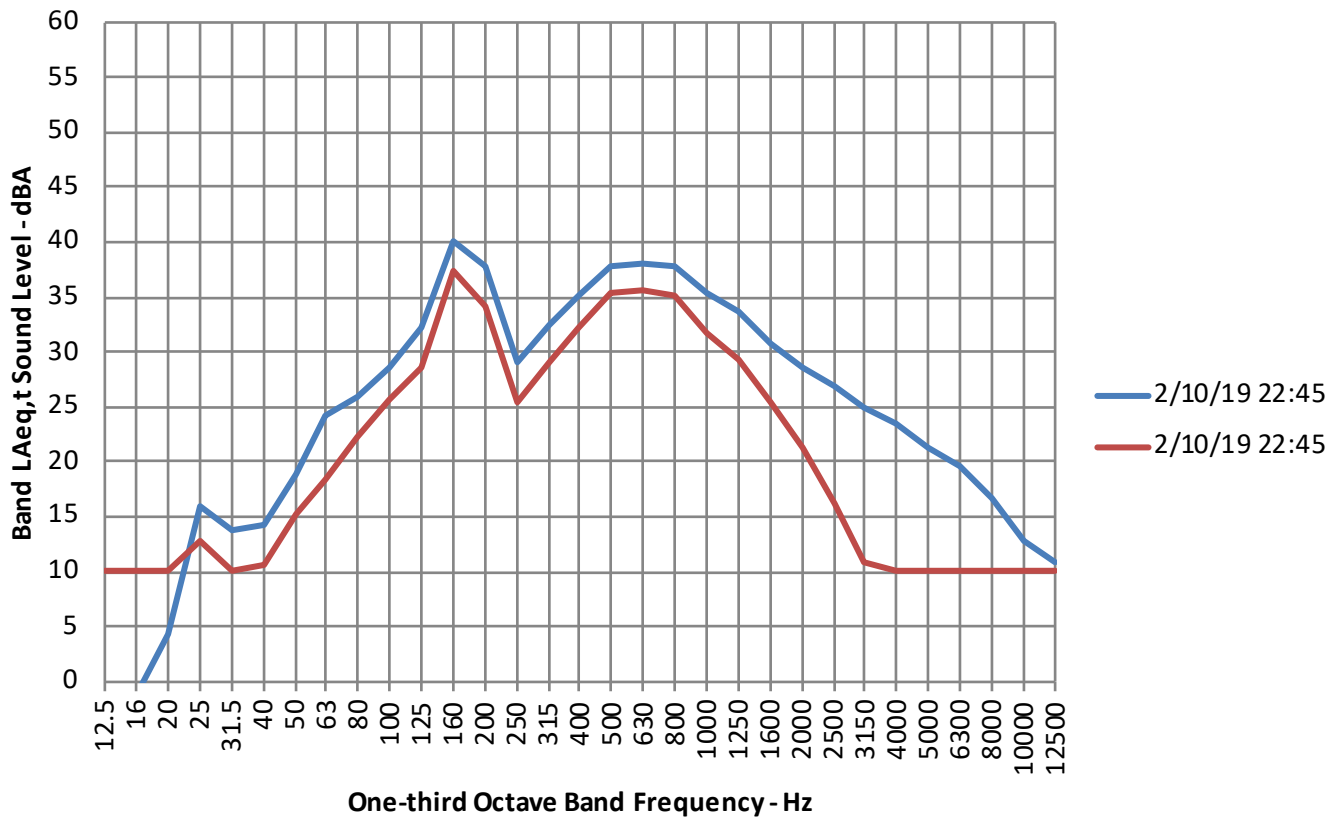


**Figure A94 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 30 Adelaide St**



**Figure A95 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 30 Adelaide St**



**Figure A96 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 30 Adelaide St**

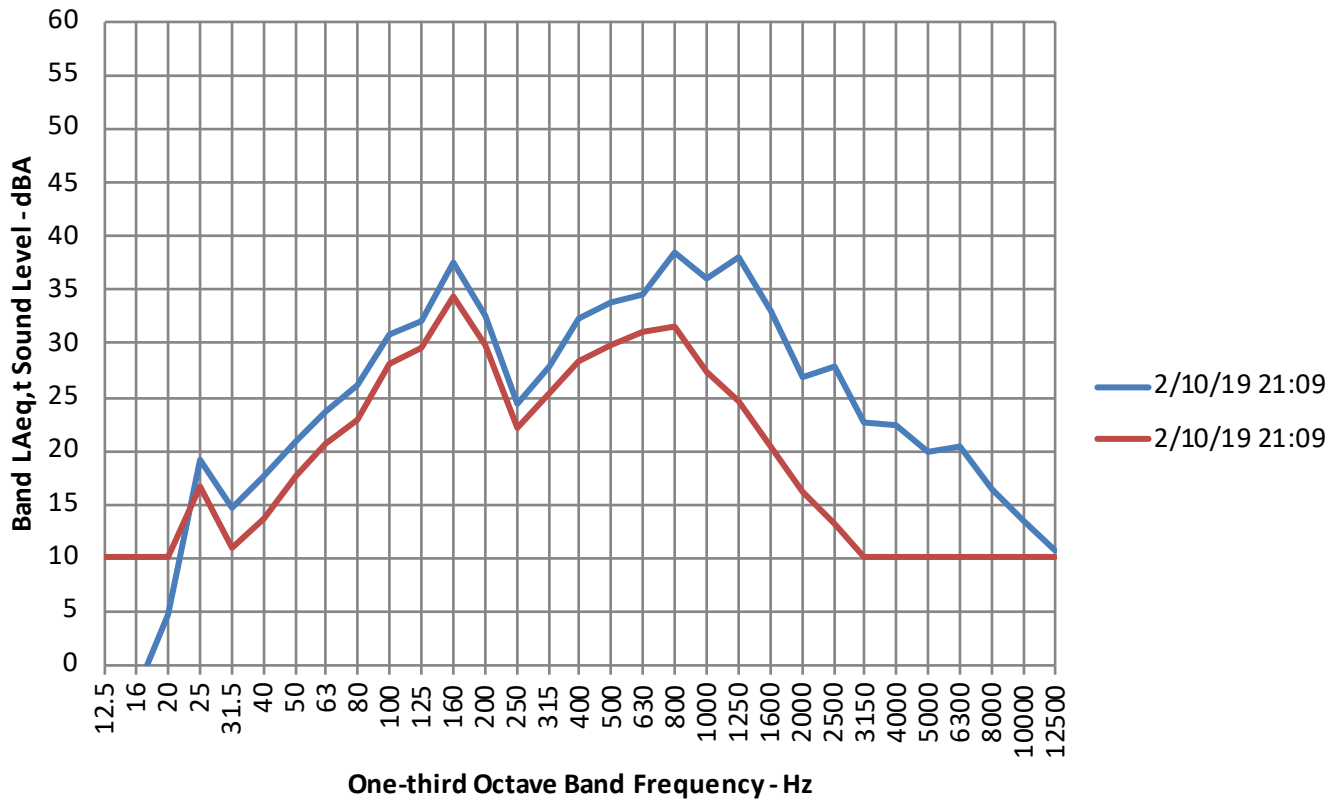


**Figure A97 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra 30 Adelaide St**



**Figure A98 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Argyle St**



**Figure A99 : Boral Cement Berrima Annual Noise 2019 Attended monitoring
Residences Frequency Spectra Argyle St**



**Figure A100 : Boral Cement Berrima Annual Noise 2019 - Low Frequency
Assessment Residential Receivers 4 Melbourne St**

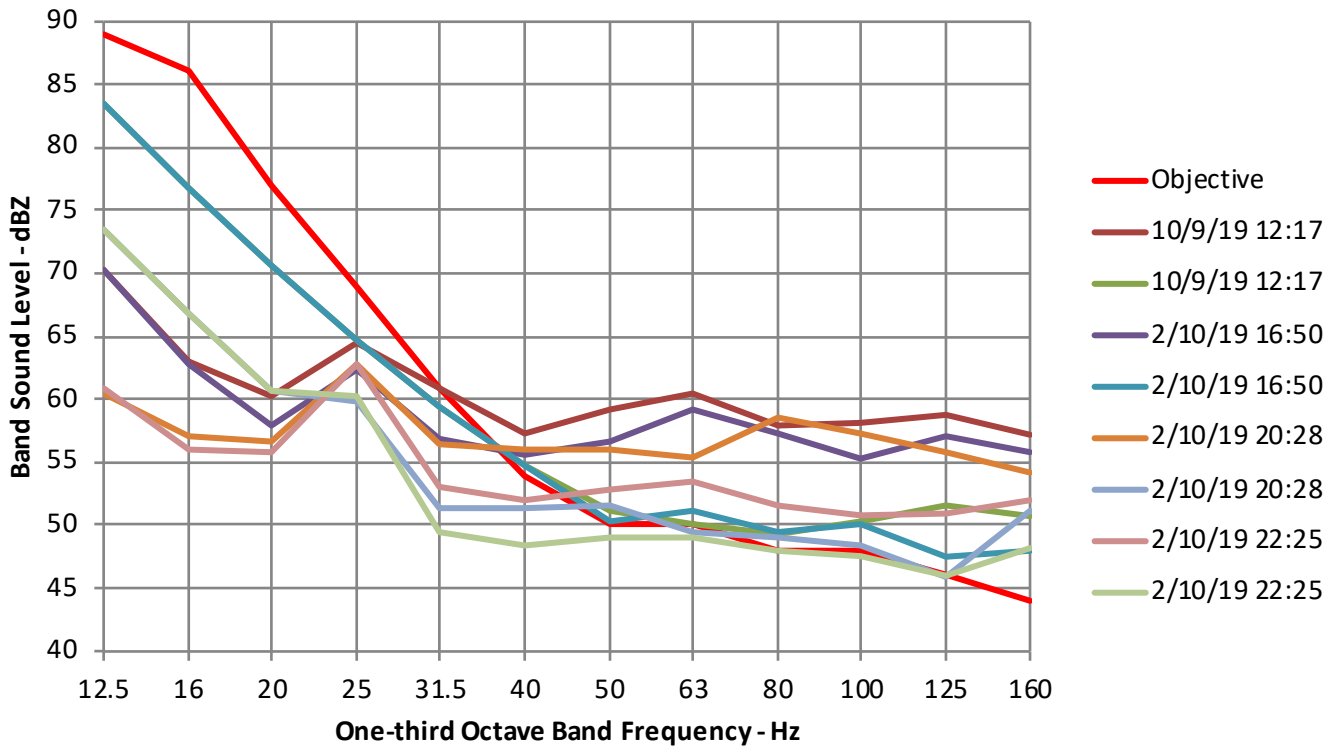


**Figure A101: Boral Cement Berrima Annual Noise 2019 - Low Frequency
Assessment Residential Receivers 72 Taylor Ave**

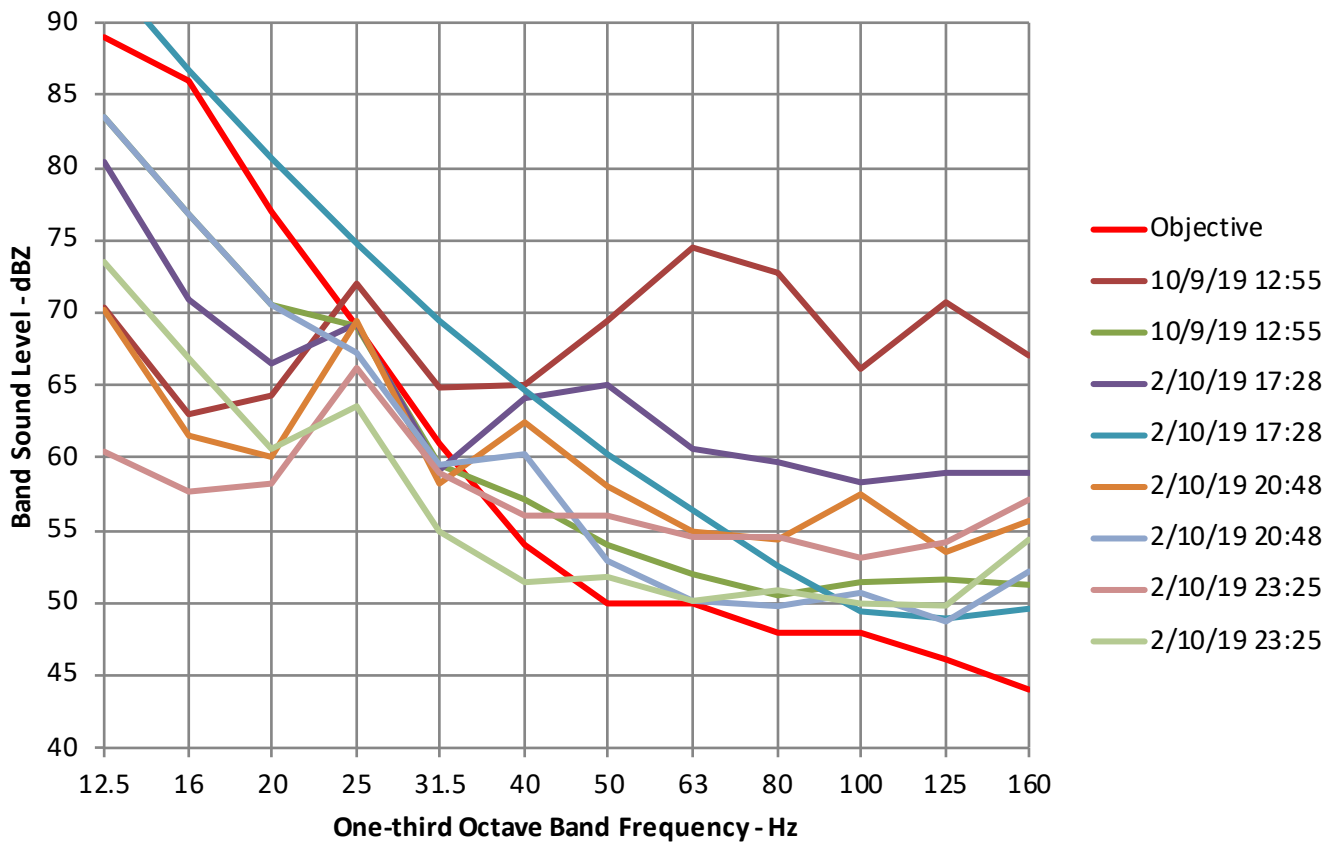


**Figure A102 : Boral Cement Berrima Annual Noise 2019 - Low Frequency
Assessment Residential Receivers 12 Brisbane St**

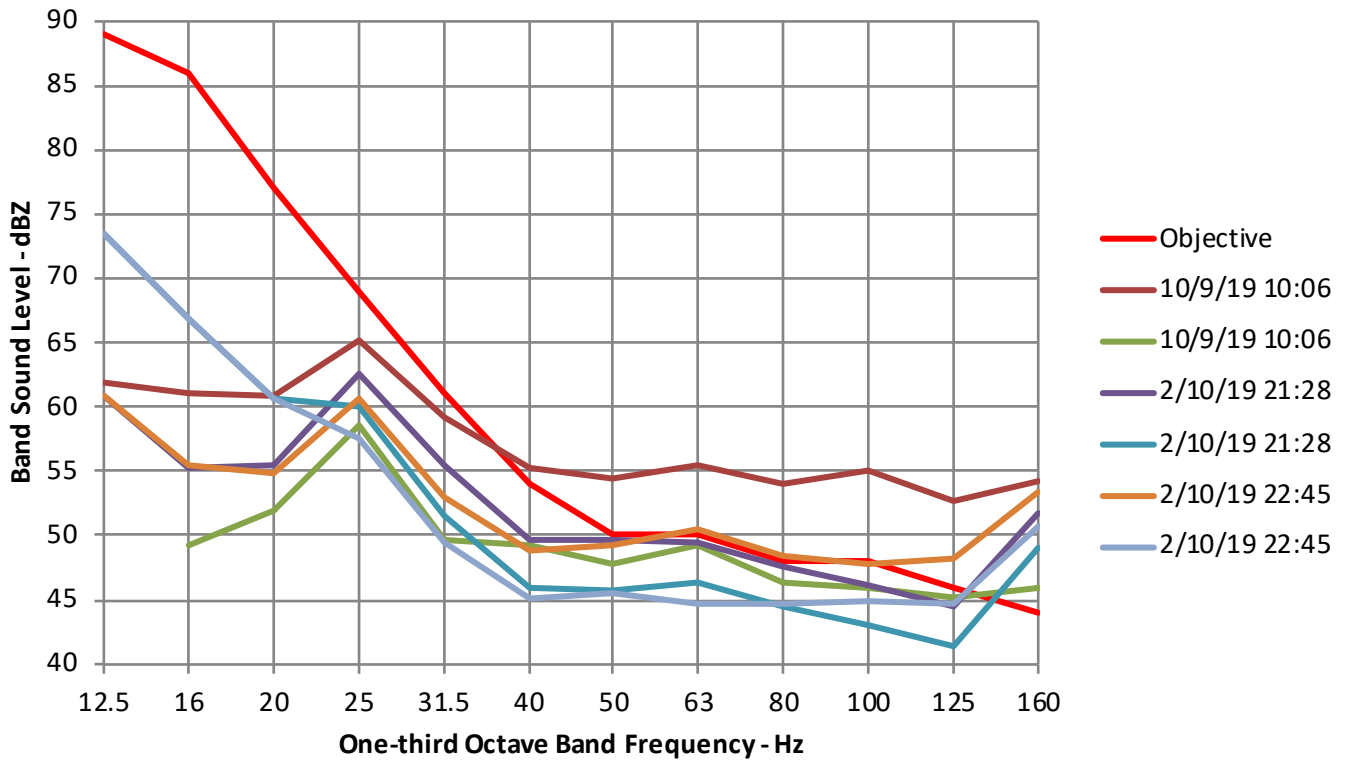


**Figure A103: Boral Cement Berrima Annual Noise 2019 - Low Frequency
Assessment Residential Receivers 30 Adelaide St**

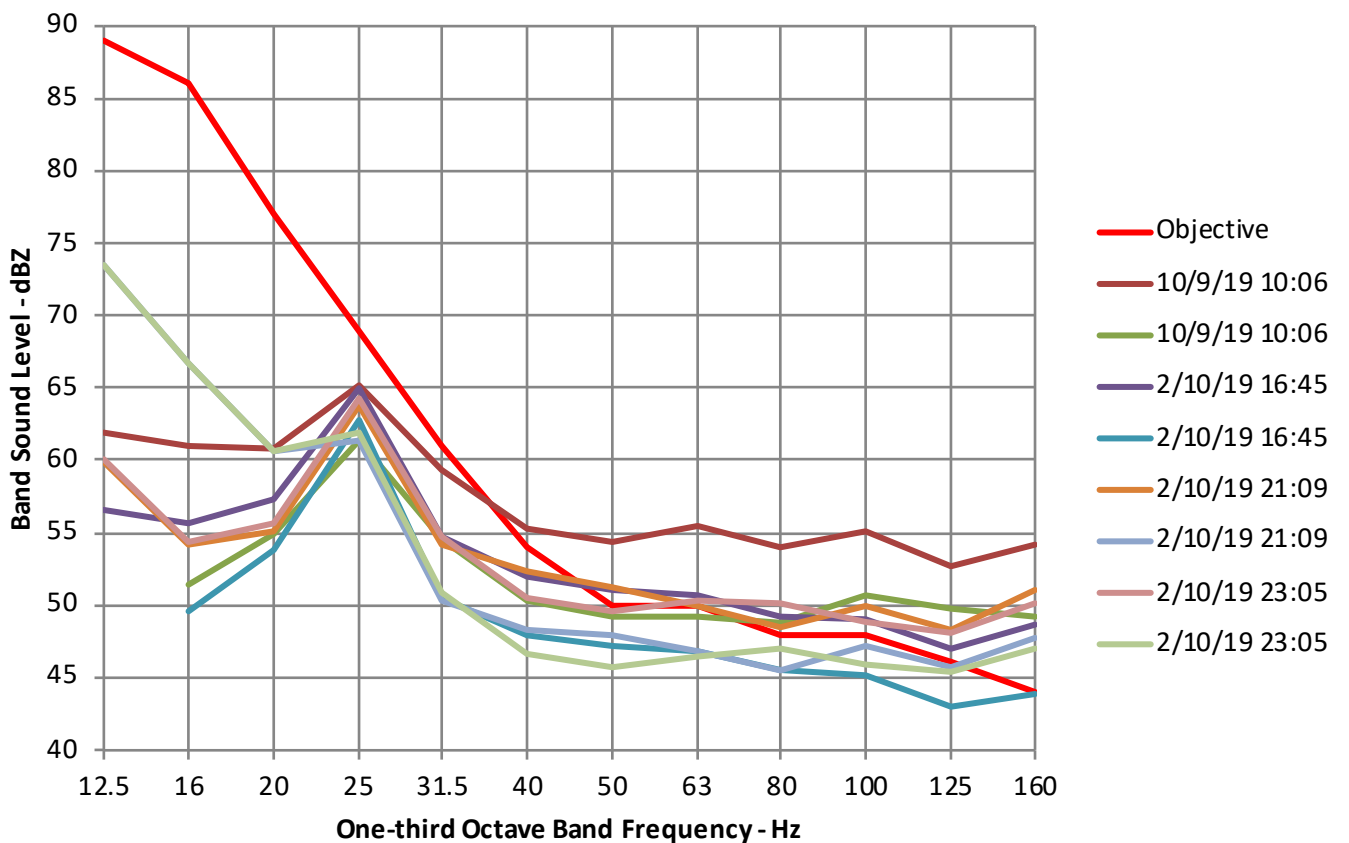


**Figure A104: Boral Cement Berrima Annual Noise 2019 - Low Frequency
Assessment Residential Receivers Argyle St near Taylor Ave**

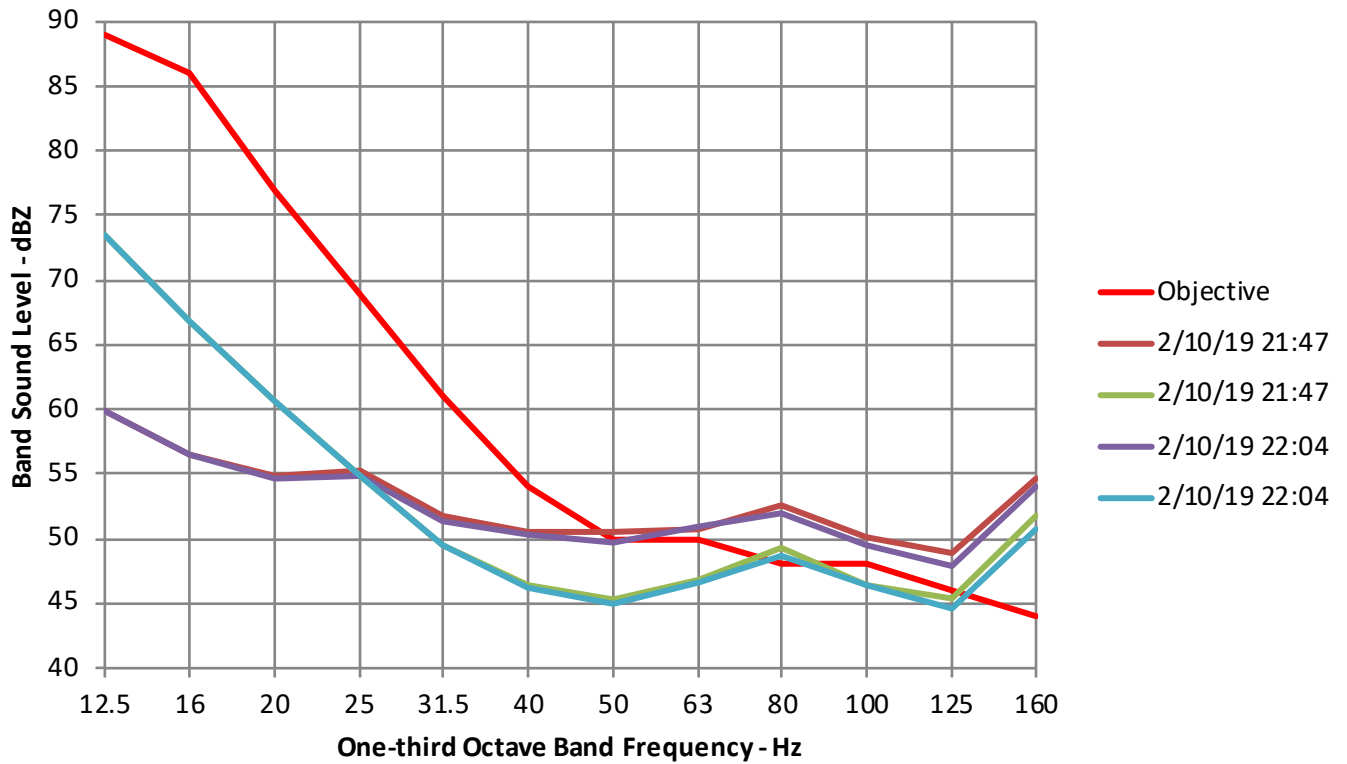


**Figure A105: Boral Cement Berrima Annual Noise 2019 - Low Frequency
Assessment
North Fence**

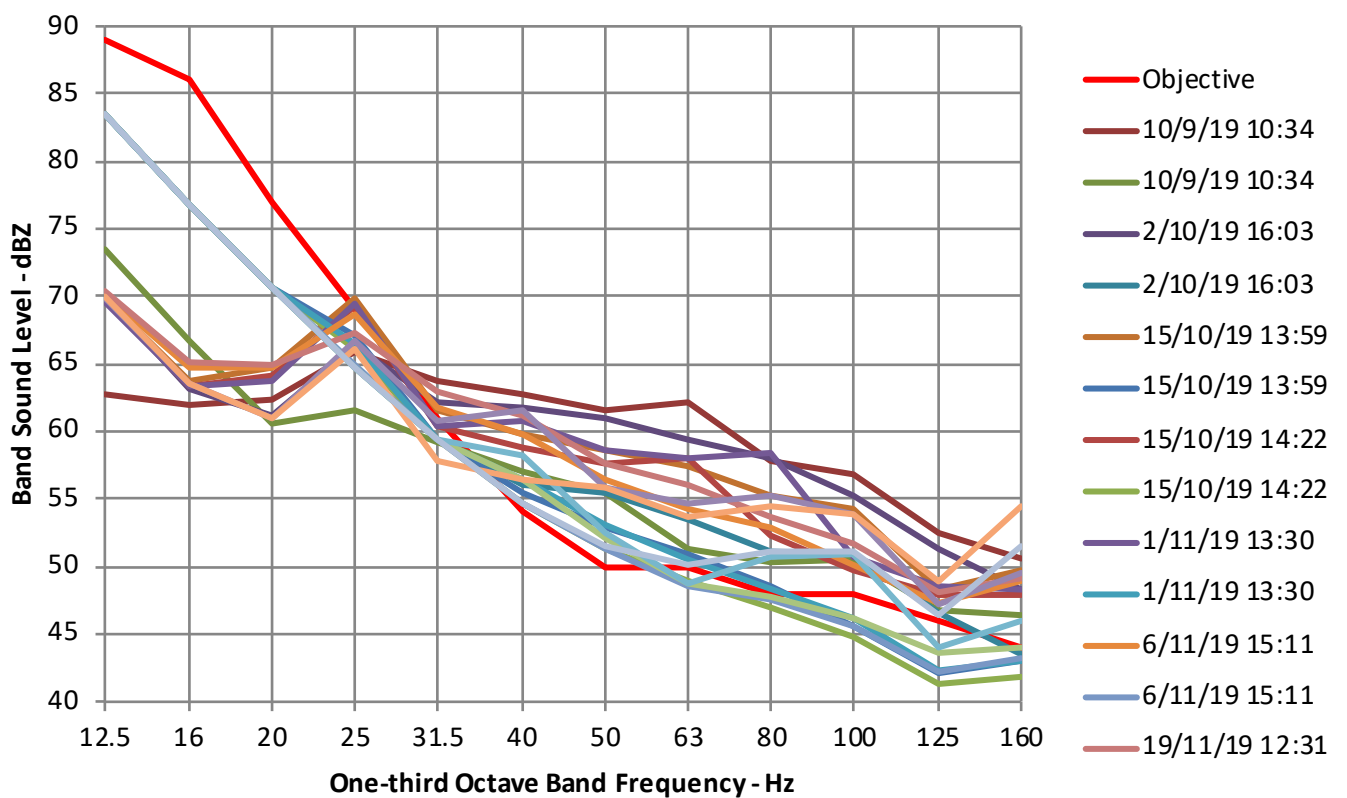
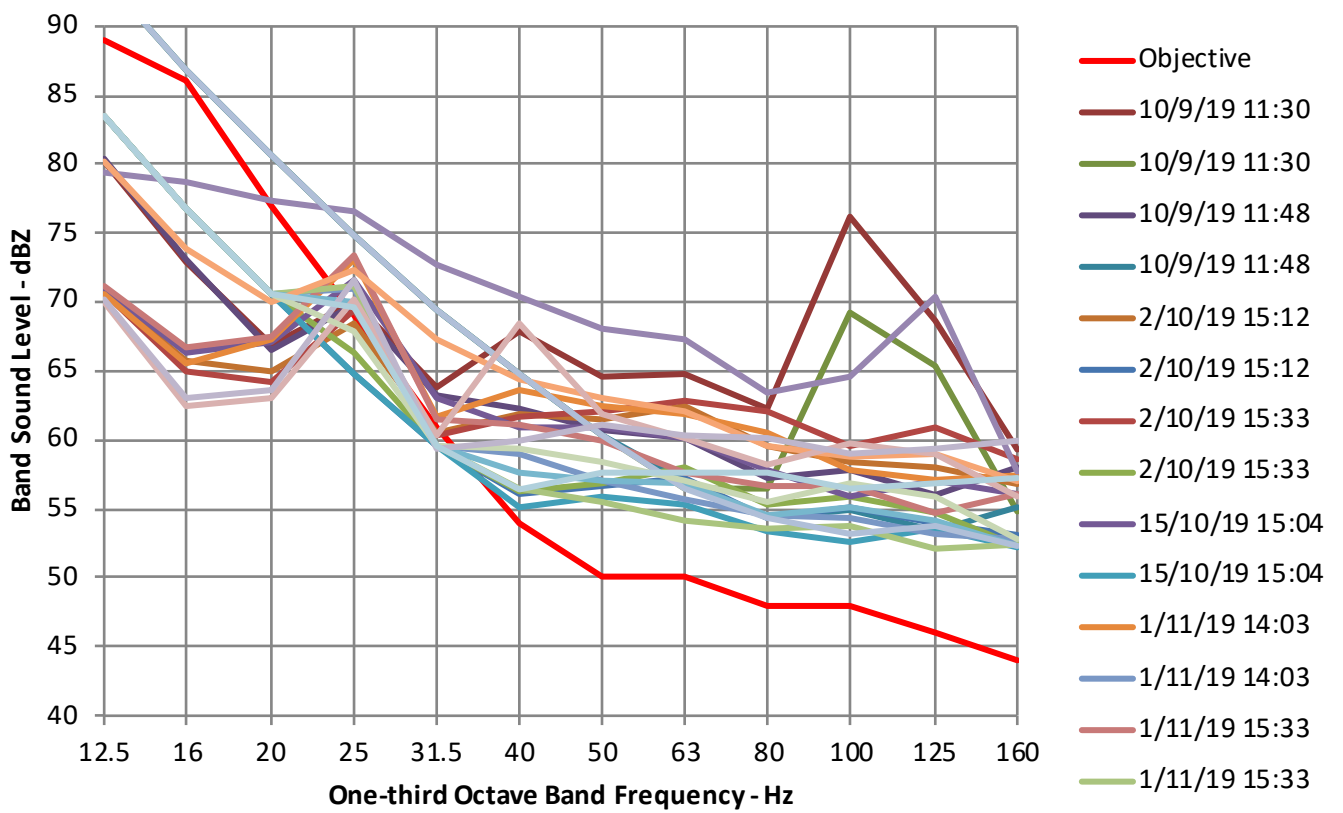


Figure A106: Boral Cement Berrima Annual Noise 2019 - Low Frequency
Assessment
Store Yard Close



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

4 Melbourne St., New Berrima
Daytime LAEQ 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
7:00			52	51	50	49	49		55	52	51	47	51	51	52	53	49	55	44	50	2.6
7:15			49	50	51	52	47	54	54	53	51	48	51	51	51	54	49	54	47	51	2.3
7:30			51	53	49	50	44		54	52	53	46	50	51	50	48	54	54	44	50	2.6
7:45			49	52	50	50	49	54	54	52	51	49	50	52	53	53	51	54	47	51	1.9
8:00			51	53	50	49	44	55	55	52	51	48	50	51	50	51	50	55	44	51	2.6
8:15			51	54	50	52	49		55	53	51	51	55	51	52	52	50	55	49	52	1.9
8:30			50	53	51	50	48	54	54	53	51	48	56	53	50	49	50	56	48	51	2.3
8:45			50	57	52	49	48	54	55	52	50	49	57	53	51	52	49	57	48	52	2.9
9:00			51	56	55	50	53		56	53	54	45	56	59	52	48	51	59	45	53	3.6
9:15			50	56	51	52	45	55	54	53	50	48	53	61	51	49	50	61	45	52	3.6
9:30			49	54	52	49	46		54	53	50	47	50	61	51	50	52	61	46	51	3.5
9:45			51	58	51	49	51		55	52	52	56	56	61	50	52	54	61	49	53	3.2
10:00			50	57	50	51	50	53	55	54	50	49	55	62	53	50	48	62	48	52	3.6
10:15			50	61	51	51	49	52	56	52	50	48	59	60	49	49	50	61	48	53	4.3
10:30			51	60	49	48	49	55	55	51	52	51	55	62	53	49	49	62	48	53	4.1
10:45			50	57	49	49	51		55	52	51	50	54	62	51	50	53	62	49	53	3.5
11:00			50	61	50	50	51	54	55	50	51	49	56	60	50	50	48	61	48	53	4.2
11:15			51	59	50	49	51	54	54	50	52	48	58	60	51	52	48	60	48	52	3.7
11:30			52		52	50	50	54	54	52	51	48	58	62	52	51	50	62	48	52	3.6
11:45			49		51	50	52	55	56	50	51	50	59	61	57	50	50	61	49	53	3.9
12:00			54		49	50	47	54	57	52	50	51	54	63	58	51	51	63	47	53	4.2
12:15			51	59	53	50	46		55	51	51	48	54	63	58	52	50	63	46	53	4.7
12:30	51	50	60	52	50	48	58	56	55	53	51	52	55		59	51	49	60	48	53	3.7
12:45	55	51	59	53	49	48	59		55	50	51	49	57	63	56	57	55	63	48	54	4.2
13:00	52	51	59	53	49	50	58	55	54	51	51	47	52	61	58	53	51	61	47	53	3.8
13:15	53	51	61	49	47	49	55		56	52	51	46	53		55	52	49	61	46	52	3.9
13:30	51	51	62	55	49	52	53	54	54	52	52	47	51	58	59	52	51	62	47	53	3.7
13:45	54	51	59	49	51	49	53		55	55	52	49	55	58	56	58	54	59	49	54	3.3
14:00	52	51	60	49	51	53	53		55	54	52	56	55		58	53	50	60	49	53	3.1
14:15	53	52	53	51	51	60	53		55		50		53	56	59	55	49	60	49	54	3.2
14:30	51	53	59	51	53	52	57	54	53	55	49	48	55	61	59	56	50	61	48	54	3.8
14:45	51	52	57	50	50	51	57	53	55	53	54	53	52	62	56		50	62	50	53	3.1
15:00	51	52	58	53	50	51	60		55	52	53	58	55	59	57	52	50	60	50	54	3.4
15:15	52	52	54	51	54	51	57		56	52	52	53	54	57	55	51	50	57	50	53	2.1
15:30	53	51	57	53	50	51	55	57	55	50	52	56	55	56	58	54	51	58	50	54	2.6
15:45	51	51	56	54	50	54	55	57	55	51	51	49	52	56	57	54	49	57	49	53	2.7
16:00	54	48	58	53	50	55	55		55	55	51	51	54	52	55	55	49	58	48	53	2.6
16:15	52	50	58	50	49	52	54	55	54	51	50	49	49	61	56	56	49	61	49	53	3.5
16:30	51	50	58	52	50	51	55		56	52	51		52	61	57	55	53	61	50	53	3.3
16:45	50	50	58	52	53	50	55	57	54	50	51	48	51	60	57	54	52	60	48	53	3.5
17:00	52	50	57	51	49	49	53	58	53	52	50	50	52	62	55	54	53	62	49	53	3.4
17:15	50	50	57	49	48	50	52	54	53	50	50	48	49	62	57	55	52	62	48	52	3.8
17:30	51	51	55	51	52	49	53	56	52	50	51	51	51	62	56	52	49	62	49	52	3.2
17:45	51	49	52	49	49	47	54	54	50	51	51	46	59	51	51	50	59	59	46	51	2.9
18:00	50	48	54	49	48	48	50	54	50	48	48	49	48	60	47	52	52	60	47	50	3.3
Max	55	54	62	55	54	60	60	58	57	55	54	58	59	63	59	58	55	63	54	57	2.9
Min	50	48	50	49	47	44	47	52	50	48	48	45	48	51	47	48	48	52	44	48	2.0
Ave	52	51	57	51	50	50	54	55	54	52	51	50	53	59	54	52	50	59	50	53	2.6
SD	1.3	1.2	3.0	1.7	1.4	3.0	3.2	1.3	1.3	1.4	1.1	2.9	2.8	4.0	3.3	2.3	1.7	4.0	1.1	2.2	0.9
E Ave	52	51	58	51	50	51	55	55	54	52	51	51	54	60	55	53	51	60	50	53	2.8

Evening LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
18:00	50	48	54	49	48	48	50	54	50	48	48	49	48	60	47	52	52	60	47	50	3.3
18:15	52	47	53	51	48	46	53	53	51	51	48	48	47	58	47	51		58	46	50	3.1
18:30	49	46	52	48	47	44	49		50	48	49	47	48	54	47	51		54	44	49	2.4
18:45	50	48	48	46	47	44	49	52	51	50	49	44	45	49	50	50		52	44	48	2.5
19:00	49	46	47	45	47	44	49		48	48	47	45	47	46	47	56		56	44	47	2.7
19:15	49	46	47	46	46	41	49		49	47	47	44	45	45	48	49		49	41	46	2.2
19:30	49	45	46	46	45	44	51		49	49	48	43	45	45	46	46		51	43	46	2.2
19:45	48	48	49	44	45	41	52		49	47	48	43	46	45	47	47		52	41	47	2.6
20:00	47	47	46	44	46	43	51	54	47	46	46	44	46	45	45	43		54	43	46	2.8
20:15	47	46	49	44	44	43	49	53	48	45	44	44	44	44	48	48		53	43	46	2.6
20:30	47	44	50	44	44	42	54	50	48	47	47	42	45	46	46	45		54	42	46	3.2
20:45	48	45	48	46	43	42	57	50	49	43	50	45	44	44	47	47		57	42	47	3.7
21:00	46	45	46	45	41	41	53	52	49	45	47	42	43	46	46	45		53	41	46	3.4
21:15	46	47	48	46	43	42	50	51	49	43	48	40	42	45	45	42		51	40	46	3.2
21:30	47	44	46	44	43	41	51	50	50	42	49	43	41	47	45	46		51	41	46	3.2
21:45	48	45	46	45	44	43		51	48	47	47	43	42	45	42	46		51	42	45	2.4
22:00	47	43	46	47	41	42		49	49	42	44	41	43	43	45	45		49	41	44	2.4
Max	52	48	54	51	48	48	57	54	51	51	50	49	48	60	50	56	52	60	48	52	3.6
Min	46	43	46	44	41	41	49	50	47	42	44	40	41	43	42	42	52	52	40	44	3.3
Ave	48	46	48	46	45	43	51	52	49	46	47	44	45	47	46	48	52	52	43	47	2.6
SD	1.6	1.5	2.4	1.9	2.2	1.9	2.3	1.5	1.0	2.5	1.5	2.3	2.1	5.0	1.7	3.5		5.0	1.0	2.2	0.9
E Avg	48	46	49	46	45	43	52	52	49	47	48	45	45	51	47	49	52	52	43	48	2.7

Night LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD		
22:00	47	43	46	47	41	42	57	51	49	42	44	41	43	43	45	45		49	41	44	2.4		
22:15	47	44	46	48	43	42			49	43	45	42	39	45	45	43				51	39	45	3.0
22:30	47	44	44	44	42	44			48	46	48	43	40	42	44	46				48	40	44	2.3
22:45	48	44	44	45	42	41			52	49	44	45	41	40	46	45	46			52	40	45	3.2
23:00	48	44	45	46	42	40			51	49	46	46	42	39	46	46	41			51	39	45	3.4
23:15	46	47	46	50	42	40			50	48	44	43	43	40	42	46	47			57	40	46	4.4
23:30	46	45	44	48	43	40			51	48	45	47	42		42	46	46			51	40	45	2.9
23:45	47	44	45	47	43	40	50	49	43	47	43	40	46	46	48			50	40	45	2.9		
0:00	41	43	45	47	41	41	49	47	46	42	41	39	42	45	47			49	39	44	3.0		
0:15	43	45	47	48	42	40	51	48	45	45	42	39	42	47	45			51	39	45	3.3		
0:30	45	45	47	51	43	40	49	49	45	42	44	43	43	44	45			51	40	45	2.9		
0:45	44	47	47	49	42	41	48	47	41	45	43	38	44	44	45			49	38	44	3.0		
1:00	45	41	46	51	42	42	50	47	43	44	43	39	45	44	43			51	39	44	3.2		
1:15	45	46	46	47	42	37	49	47	44	42	41	41	44	44	45			49	37	44	3.0		
1:30	45	41	46	49	43	39	50	46		42	42	41	45	43	42			50	39	44	3.2		
1:45	46	44	49	44	42	38	50	45	41	44	42	39	45	47	42			50	38	44	3.4		
2:00	46	45	49	44	42	37	51	45	42	41	45	38	43	43	44			51	37	44	3.6		
2:15	47	42	50	44	43	39	49	47	43	42	46	45	43	45	44			50	39	44	3.0		
2:30	49	43	48	47	42	39	49	47	43	42	45	42	41	45	44			49	39	44	3.2		
2:45	48	42	48	45	42	39	48	47	43	41	51	42	40	46	43			51	39	44	3.5		
3:00	47	43	49	45	42	38	50	46	43	45	45	38	44	47	44			50	38	44	3.3		
3:15	43	41	49	43	42	40	50	49	47	41	43	43	43	42	47	45		50	40	44	3.2		
3:30	46	44	49	44	42	37	51	43	44	43	41	44	44	47				51	37	44	3.4		
3:45	51	45	49	44	47	41	49		44	41	43	41	46	44	43			51	41	45	3.1		
4:00	46	46	50	46	41	47	50	50	44	47	45	40	46	47	41			50	40	46	3.2		
4:15	47	47	49	44	43	43	50	50	46	43	45	45	44	44	44			50	43	46	2.5		
4:30	49	47	46	46	41	39	51	51	48	43	52	44	49	45	44			52	39	46	3.7		
4:45	49	46	44	46	42	45	48	51	51	47	42	46	40	47	45	44		51	40	46	3.1		
5:00	49	46	47	46	42	44	49	52	48	48	47	44	44	49	48	47		52	42	47	2.4		
5:15	51	49	50	46	43	47	52	48	47	45	45	46	50	48	46			52	43	47	2.4		
5:30	50	49	51	48	42	48	54	52	48	46	45	47	50	50	50			54	42	49	3.1		
5:45	52	50	52	46	43	47	55	51	50	46	46	48	51	51	49			55	43	49	3.2		
6:00	51	51	53	47	45	49	54	52	51	47	46	49	50	53	52			54	45	50	2.5		
6:15	53	50	51	49	45	47	54	52	50	45	47	51	50	51	50			54	45	50	2.5		
6:30	52	52	52	50	45	49	54	54	52	48	53	49	51	51	50			54	45	51	2.4		
6:45	51	53	51	50	43	49	55	53	51	46	52	50	52	51	49			55	43	50	2.9		
7:00	52	51	50	49	44	49	55	52	51	47	51	51	52	53	49			55	44	50	2.6		
Max	53	53	53	51	47	49	57	55	53	52	48	53	51	52	53	52		57	47	52	2.5		
Min	41	41	44	43	41	37	48	48	45	41	41	41	38	40	43	41		48	37	42	3.3		
Ave	48	46	48	47	43	42	51	51	48	45	44	45	43	45	46	45		51	42	46	2.8		
SD	2.8	3.2	2.6	2.2	1.2	3.9	3.3	1.9	2.1	3.0	2.1	3.3	4.0	3.4	2.8	2.7		4.0	1.2	2.8	0.8		
E Avg	48	47	48	47	43	44	52	51	49	46	45	46	45	47	47	46		52	43	47	2.6		
24hr	50	49	55	50	48	48	53	54	53	50	49	48	52	57	53	51	50	57	48	51	2.5		

4 Melbourne St., New Berrima

Daytime LA90 10 September to 2 October 2019

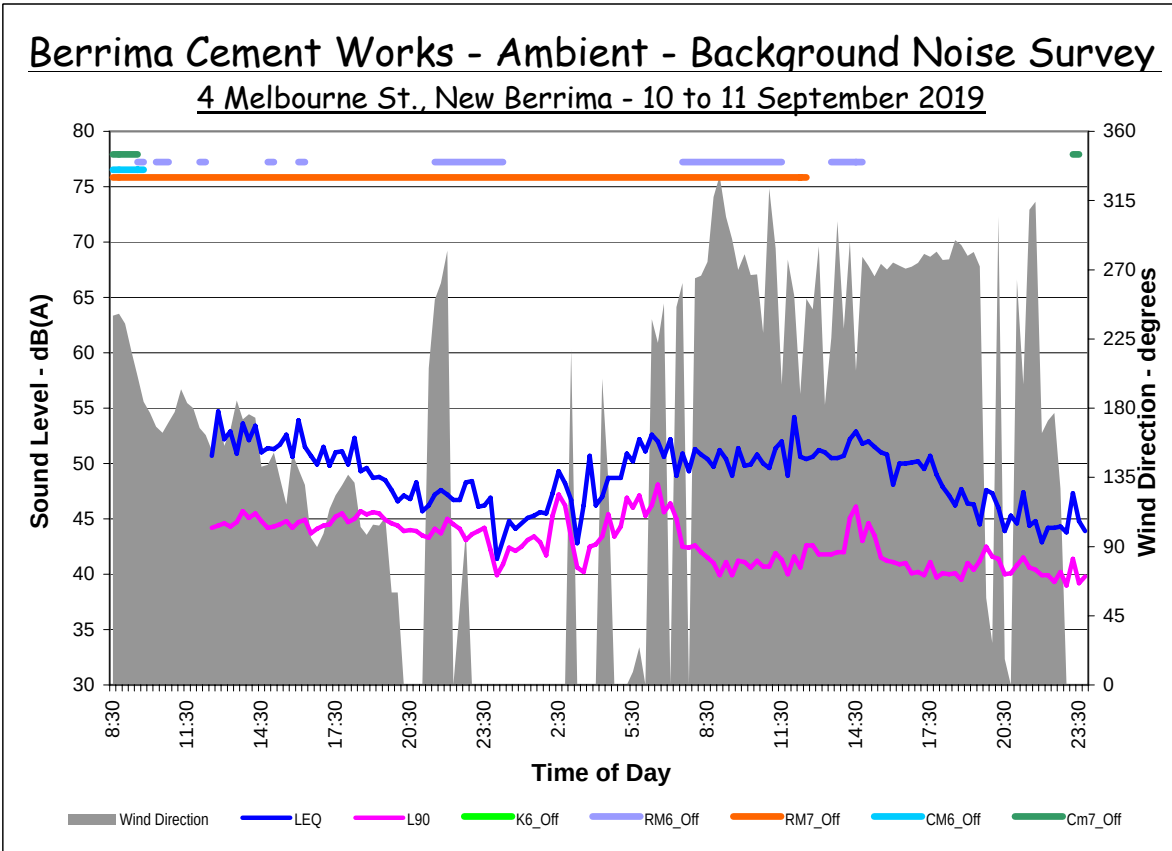
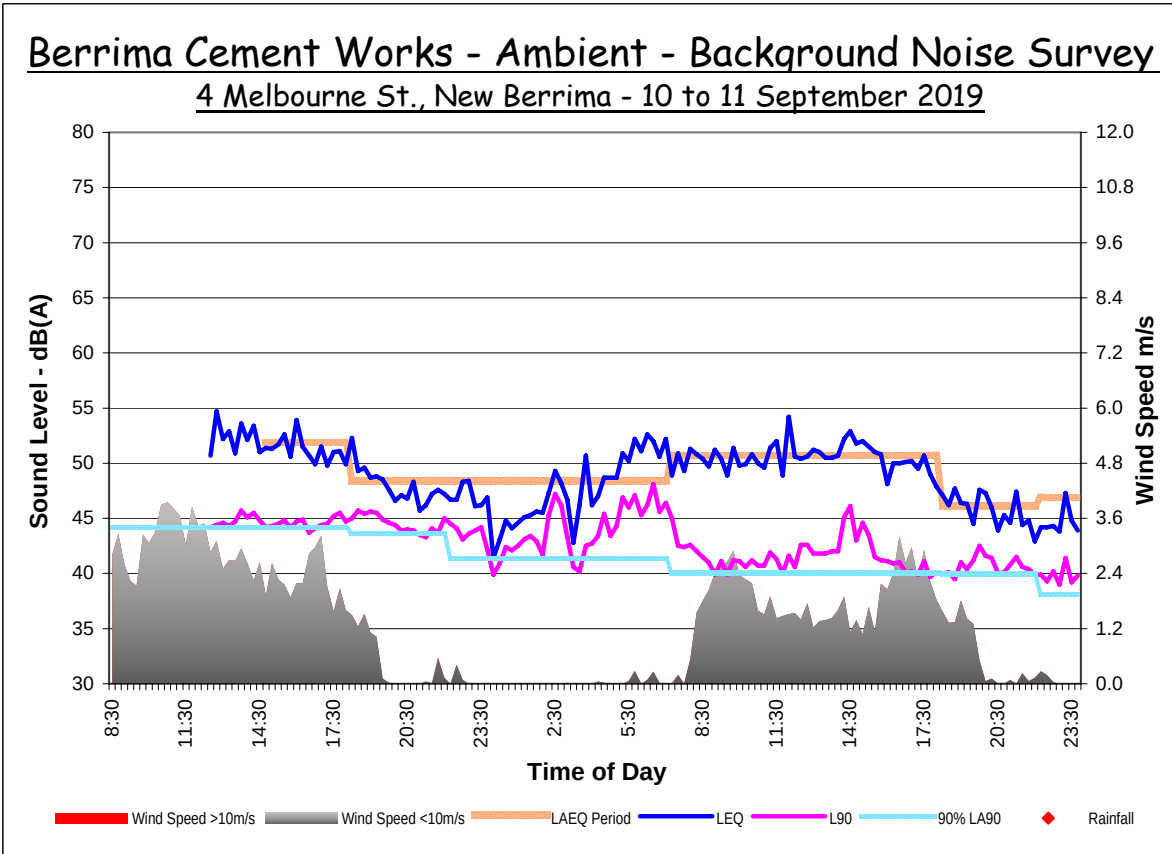
Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
7:00		46	45	44	44	40	37		50	44	43	39	44	43	45	42	38	50	37	43	3.2
7:15		45	44	44	44	40	37	50	50	46	41	39	44	44	44	42	39	50	37	43	3.5
7:30		43	45	44	44	40	38		49	45	42	39	43	44	44	42	38	49	38	43	3.0
7:45		42	45	45	43	40	39		49	45	42	39	41	43	42	43	39	49	39	43	2.9
8:00		43	45	45	44	40	39	50	49	45	42	40	42	43	40	40	38	50	38	43	3.4
8:15		42	44	44	45	41	38		49	46	43	40	42	42	42	40	38	49	38	42	2.8
8:30		42	43	44	44	41	38	49	48	45	42	40	43	42	41	40	38	49	38	42	3.1
8:45		41	44	45	45	40	39	49	49	44	41	40	42	41	41	41	37	49	37	42	3.4
9:00		40	43	45	45	39	42		49	44	42	39	44	44	41	39	37	49	37	42	3.1
9:15		41	44	43	45	39	42	50	48	43	41	40	44	44	40	39	39	50	39	43	3.3
9:30		40	42	42	43	40	40		49	42	41	39	42	43	40	41	39	49	39	41	2.5
9:45		41	44	43	44	41	41		50	42	41	39	42	44	40	41	37	50	37	42	2.9
10:00		41	43	42	44	41	42	48	50	42	41	39	43	45	41	41	36	50	36	42	3.3
10:15		41	46	41	45	41	41	47	51	42	41	39	43	44	41	41	37	51	37	43	3.4
10:30		41	44	42	44	41	41	49	50	42	41	40	42	45	42	40	39	50	39	43	3.0
10:45		41	44	43	44	41	42		48	41	41	39	42	46	42	39	38	48	38	42	2.7
11:00		41	45	41	44	41	42	49	49	40	41	42	42	45	42	41	35	49	35	42	3.3
11:15		42	45	40	44	39	40	49	48	40	42	40	43	42	42	42	35	49	35	42	3.5
11:30		41		42	44	40	40	50	48	41	40	41	43	44	41	40	35	50	35	42	3.6
11:45		40		41	44	39	42	50	49	39	39	41	42	44	41	42	36	50	36	42	3.7
12:00		42		41	43	37		50	50	41	40	42	41	45	42	42	37	50	37	42	3.8
12:15		41	44	42	43	38	43		49	40	39	42	41	45	42	43	37	49	37	42	2.9
12:30	44	43	46	42	43	38	42	51	48	41	39	41	40		40	43	36	51	36	42	3.7
12:45	44	43	45	44	43	39	44		48	39	41	41	42	44	40	44	39	48	39	42	2.6
13:00	45	42	45	42	41	38	42	51	48	41	40	38	40	44	41	43	38	51	38	42	3.6
13:15	44	42	46	40	40	39	41		49	41	40	39	40		40	41	37	49	37	41	2.9
13:30	45	42	46	40	41	40	40	49	47	39	40	40	41	42	41	44	40	49	39	42	3.0
13:45	46	42	45	40	41	39	42		48	40	40	40	40	42	42	44	39	48	39	42	2.6
14:00	45	42	46	39	42	40	42		49	40	40	40	42		43	42	38	49	38	42	2.8
14:15	46	45	43	39	42	41	46		49		40		40	43	43	45	36	49	36	42	3.4
14:30	45	46	46	41	42	40	47	49	49	43	39	41	40	43	45	43	37	49	37	43	3.5
14:45	44	43	44	41	41	41	48	49	49	42	44	43	40	45	42		40	49	40	43	3.0
15:00	44	45	45	42	43	41	49		49	42	42	44	41	44	44	42	38	49	38	43	2.9
15:15	45	44	44	42	43	41	50		49	41	42	42	40	42	43	41	37	50	37	43	3.2
15:30	45	42	44	42	42	41	49	52	49	41	41	41	40	44	44	42	39	52	39	43	3.6
15:45	44	41	43	42	43	44	50	51	49	43	42	41	41	42	46	44	39	51	39	44	3.4
16:00	45	41	44	43	43	45	48	50	49	42	42	44	42	40	47	44	39	50	39	44	3.1
16:15	45	41	43	42	43	42	48	50	48	42	41	42	42	43	45	45	39	50	39	44	3.0
16:30	44	41	43	42	43	41	49		50	43	41		43	44	44	45	41	50	41	44	2.8
16:45	44	40	44	42	40	40	48	50	48	42	41	41	42	44	45	44	42	50	40	43	3.1
17:00	44	40	43	41	40	40	48	51	48	43	42	42	42	44	43	45	42	51	40	43	3.1
17:15	45	40	44	42	41	41	48	49	48	43	42	42	42	45	43	45	41	49	40	43	2.8
17:30	45	41	43	42	44	41	48	50	47	42	42	42	41	44	42	46	39	50	39	43	3.0
17:45	46	40	41	41	44	41	49	49	46	41	42	39		43	42	46	40	49	39	43	3.1
18:00	45	40	42	43	44	41	45	49	45	41	41	39	41	41	40	43	40	49	39	42	2.6
Max	46	46	46	45	45	45	50	52	51	46	44	44	44	46	47	46	42	52	42	46	2.5
Min	44	40	41	39	40	37	37	47	45	39	39	38	40	40	40	39	35	47	35	40	3.1
Ave	45	42	44	42	43	40	43	50	49	42	41	40	42	43	42	42	38	50	38	43	2.8
SD	0.5	1.6	1.2	1.6	1.4	1.4	4.0	1.0	1.0	1.8	1.0	1.4	1.2	1.3	1.8	1.9	1.7	4.0	0.5	1.5	0.7
90%	44	40	43	40	41	39	38	49	48	40		39	40	42	40	40	36	49	36	41	3.3
																			Median	40	

Evening LA90

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
18:00	45	40	42	43	44	41	45	49	45	41	41	39	41	41	40	43	40	49	39	42	2.6
18:15	45	40	42	42	45	40	47	49	45	41	42	39	41	42	41	43		49	39	43	2.7
18:30	46	40	41	40	44	40	46		46	42	42	39	41	40	41	41		46	39	42	2.1
18:45	45	40	40	40	44	40	46	49	46	41	42	38	43	40	42	41		49	38	42	3.0
19:00	46	41	40	40	44	40	46		45	41	42	38	43	40	42	40		46	38	42	2.2
19:15	46	40	41	41	43	38	45		46	41	41	38	43	40	41	41		46	38	41	2.2
19:30	45	41	41	41	43	38	46		46	40	40	39	43	41	42	41		46	38	41	2.3
19:45	45	43	42	40	43	38	46		46	41	40	38	43	41	42	40		46	38	41	2.5
20:00	44	42	42	40	44	37	46	49	45	41	40	38	43	41	41	40		49	37	42	3.1
20:15	44	41	43	40	41	39	45	48	45	40	40	38	42	41	42	40		48	38	42	2.7
20:30	44	40	44	39	40	38	44	47	45	40	41	37	43	41	42	40		47	37	41	2.8
20:45	44	40	44	40	39	38	46	47	46	39	40	37	40	41	41	40		47	37	41	3.0
21:00	44	41	43	39	38	38	47	48	46	39	40	37	39	41	41	40		48	37	41	3.3
21:15	43	42	45	40	39	38	47	46	46	39	40	37	38	40	40	38		47	37	41	3.4
21:30	44	41	44	41	39	37	47	47	46	38	40	37	38	40	40	38		47	37	41	3.5
21:45	44	40	44	42	40	37		46	46	40	40	38	38	40	40	39		46	37	41	2.9
22:00	45	40	44	41	38	37			46	39	39	37	37	41	41	39		46	37	40	2.7
Max	46	43	45	43	45	41	47	49	46	42	42	39	43	42	42	43	40	49	39	43	2.6
Min	43	40	40	39	38	37	44	46	45	38	39	37	37	40	40	38	40	46	37	40	2.9
Ave	45	41	42	41	41	38	46	48	46	40	40	38	41	41	41	40	40	48	38	42	2.7
SD	0.8	0.8	1.5	1.0	2.5	1.2	1.0	1.2	0.4	1.0	1.0	0.8	2.2	0.5	0.7	1.4		2.5	0.4	1.1	0.6
90%	44	40	40	39	38	37	45	46	45	39	40	37	38	40	40	39	40	46	37	40	2.8
																			Median	40	

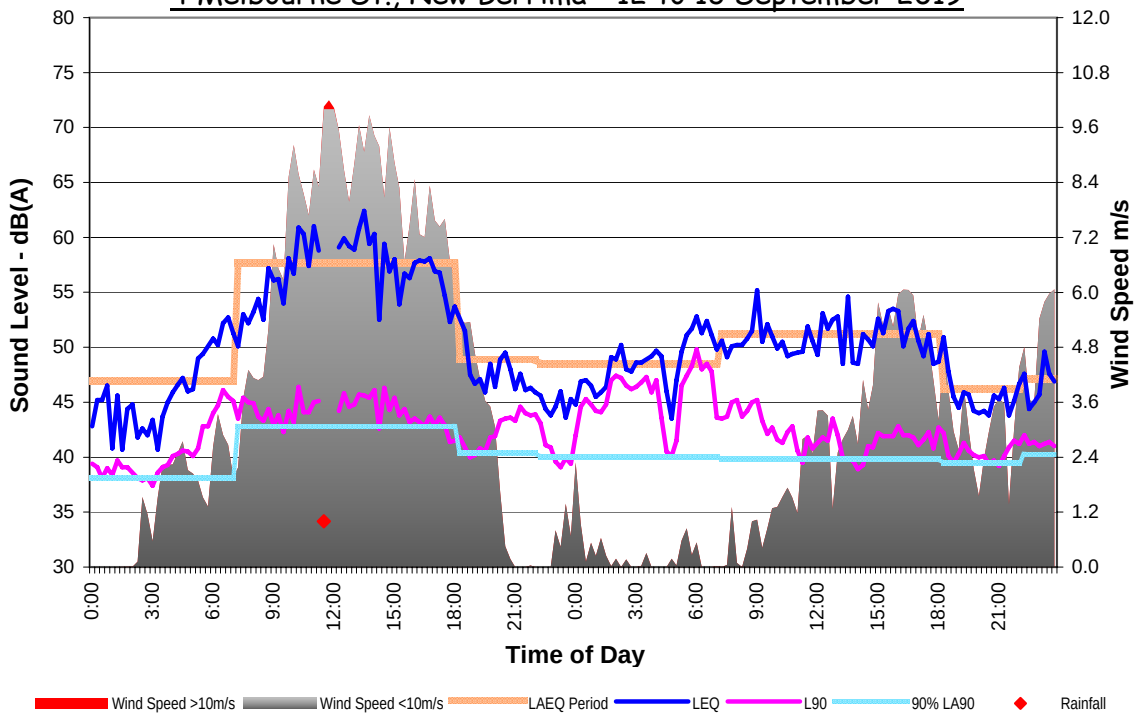
Night LA90</

Two Day Results of Ambient Noise Monitoring



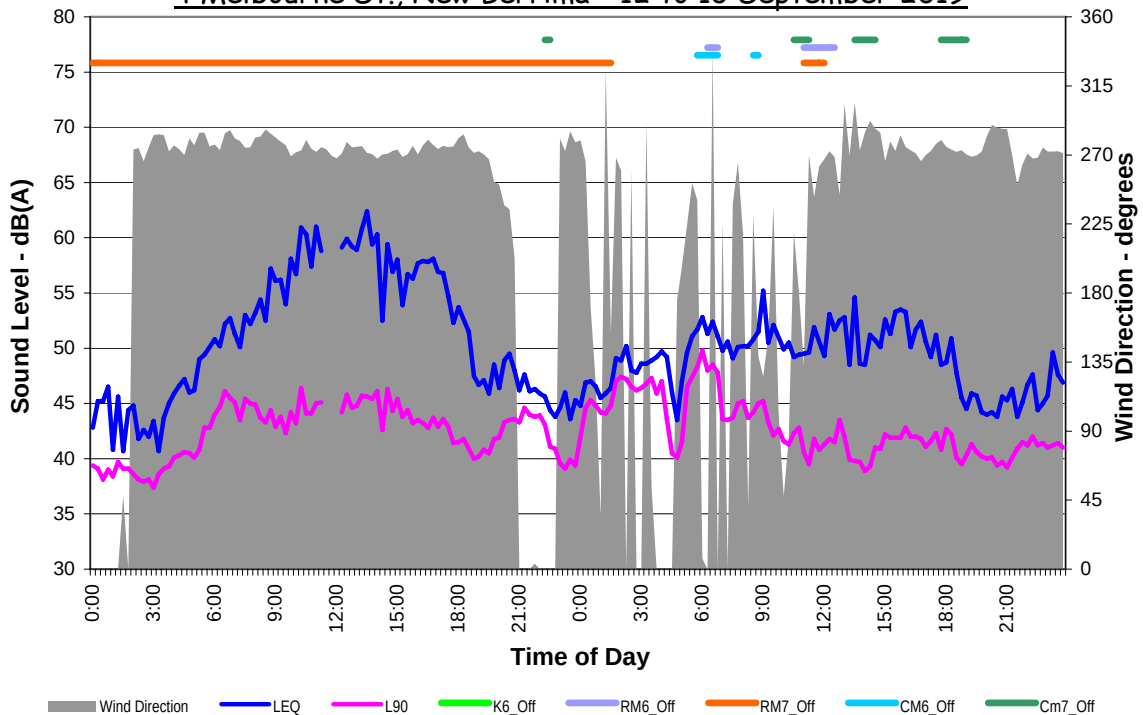
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 12 to 13 September 2019



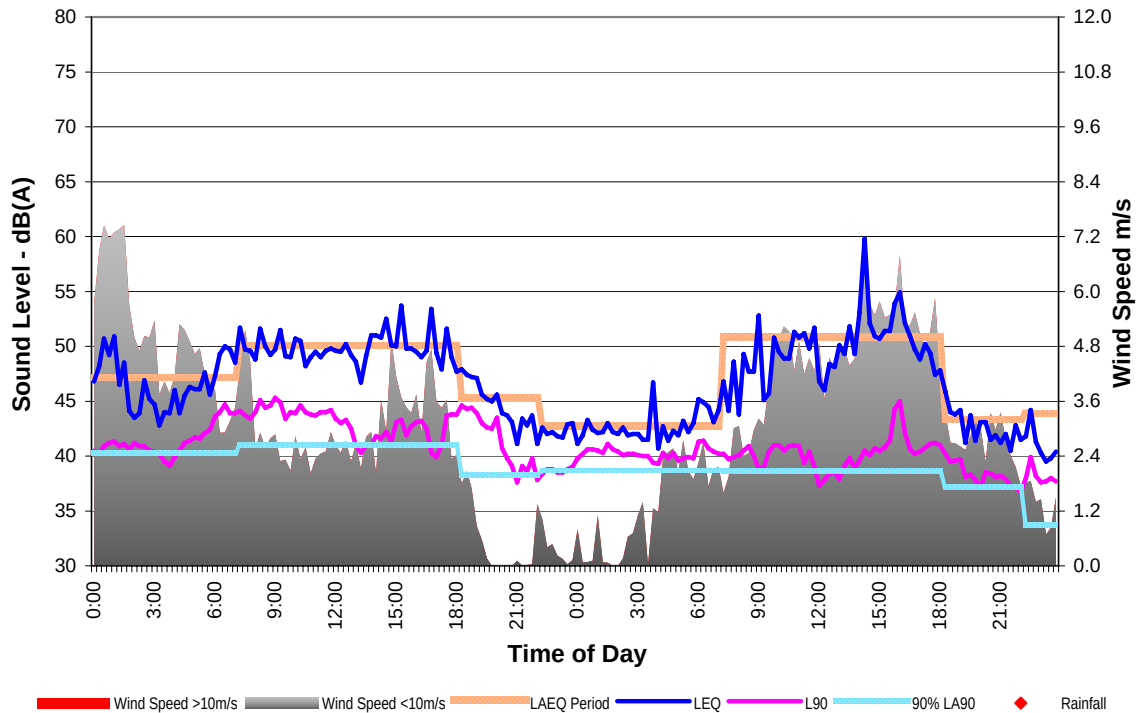
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 12 to 13 September 2019



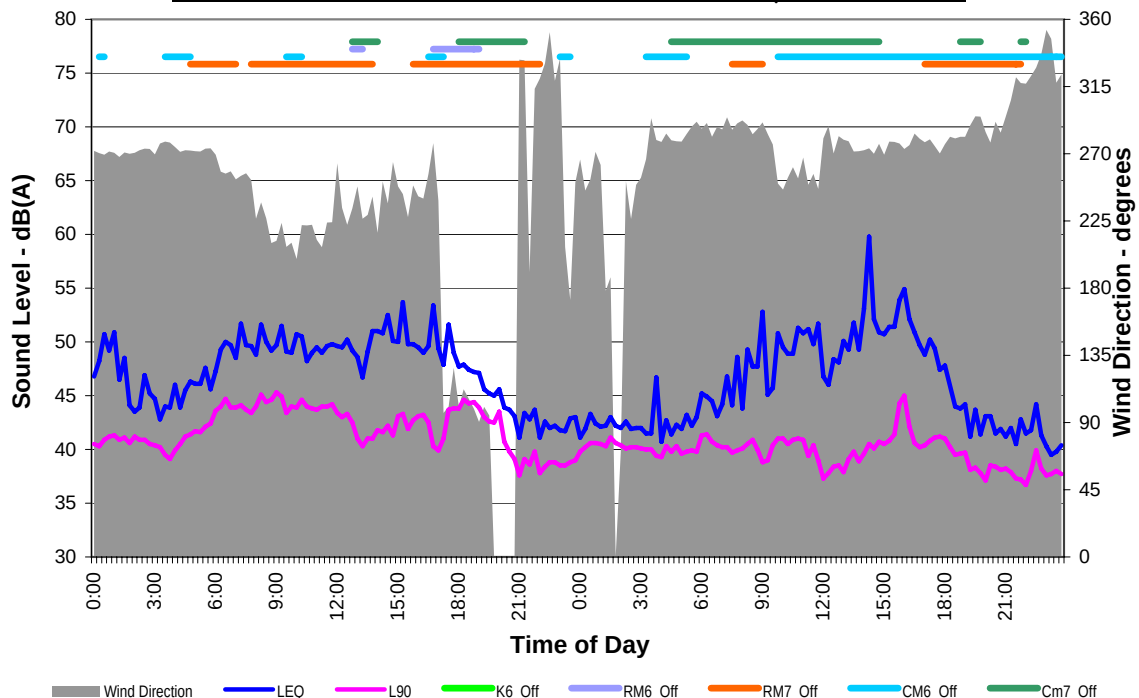
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 14 to 15 September 2019

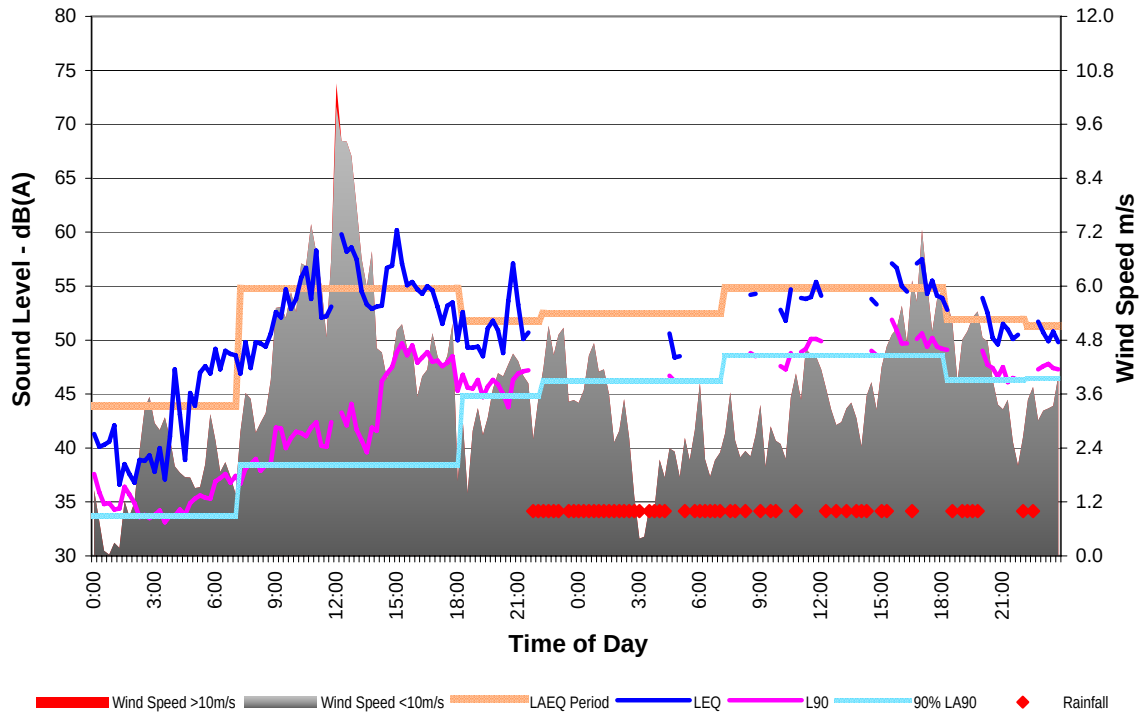


Berrima Cement Works - Ambient - Background Noise Survey

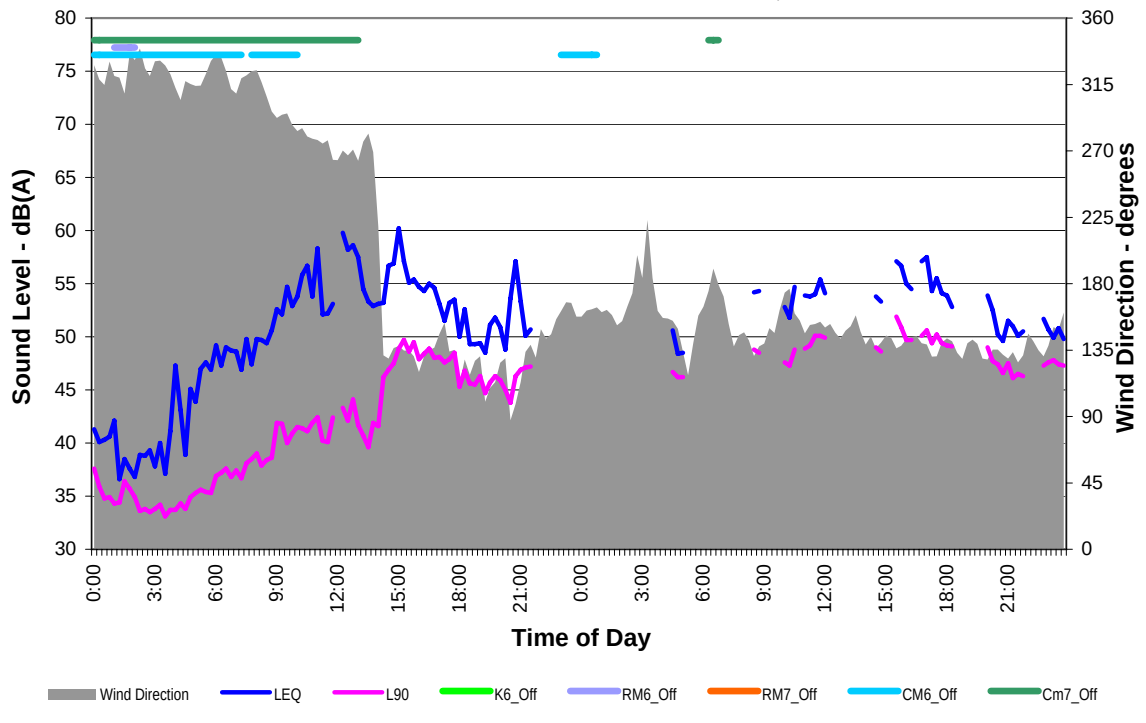
4 Melbourne St., New Berrima - 14 to 15 September 2019



Berrima Cement Works - Ambient - Backaround Noise Survey 4 Melbourne St., New Berrima - 16 to 17 September 2019

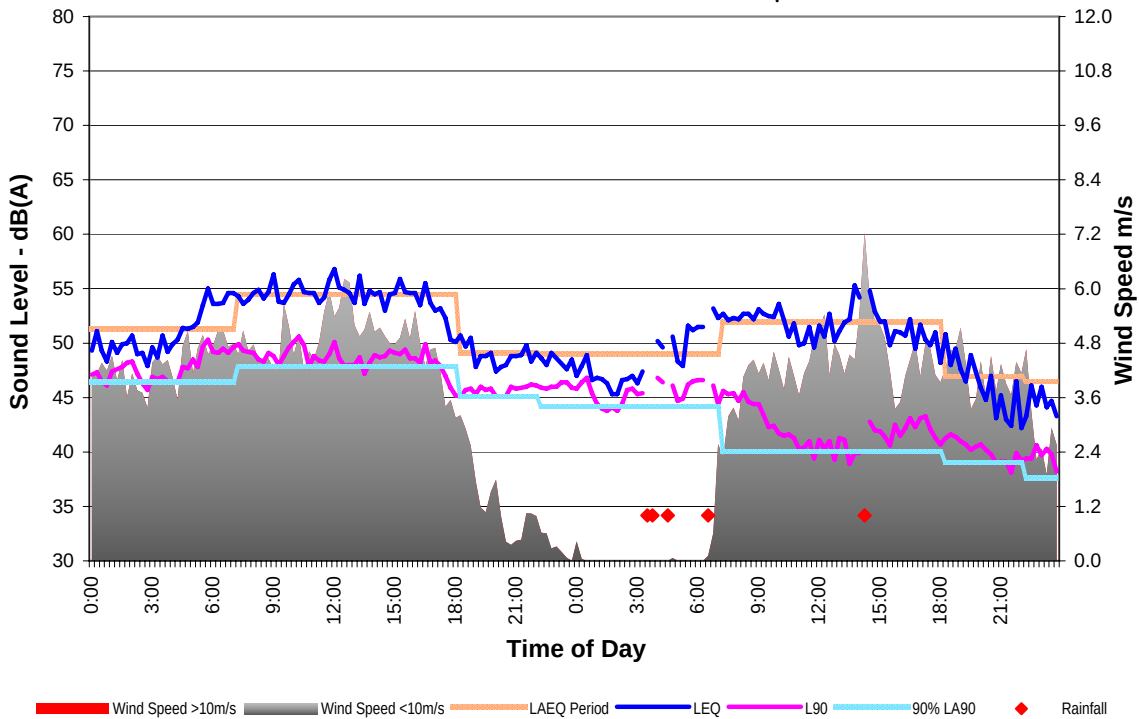


Berrima Cement Works - Ambient - Backaround Noise Survey 4 Melbourne St., New Berrima - 16 to 17 September 2019



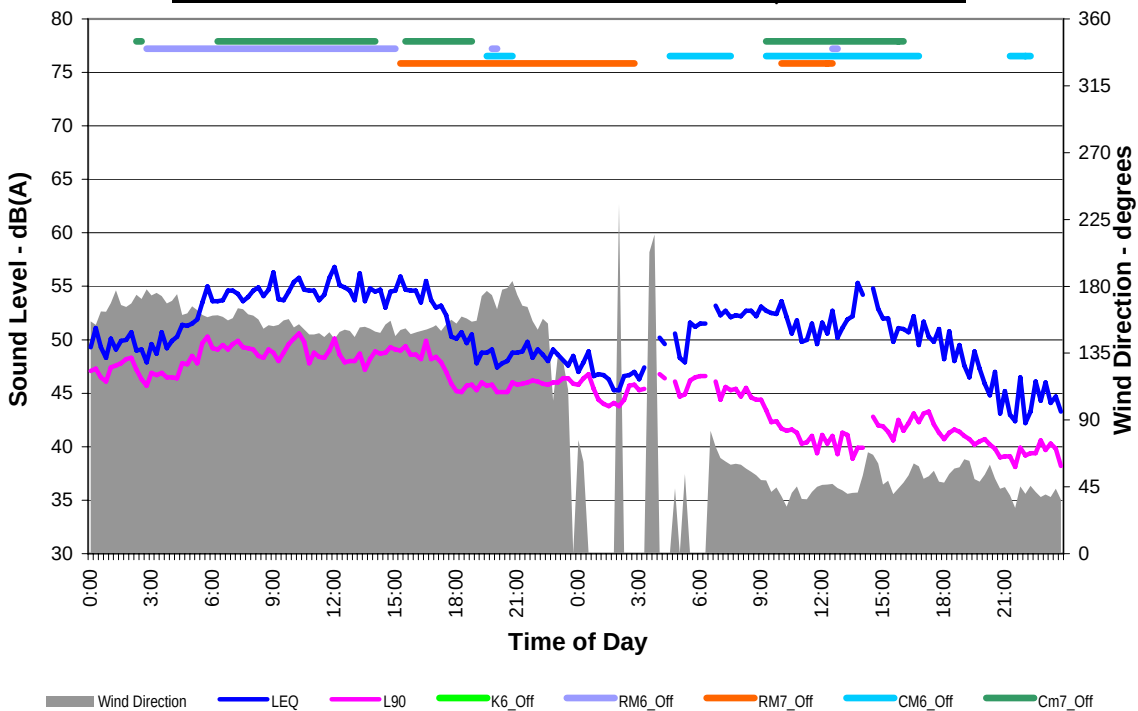
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 18 to 19 September 2019



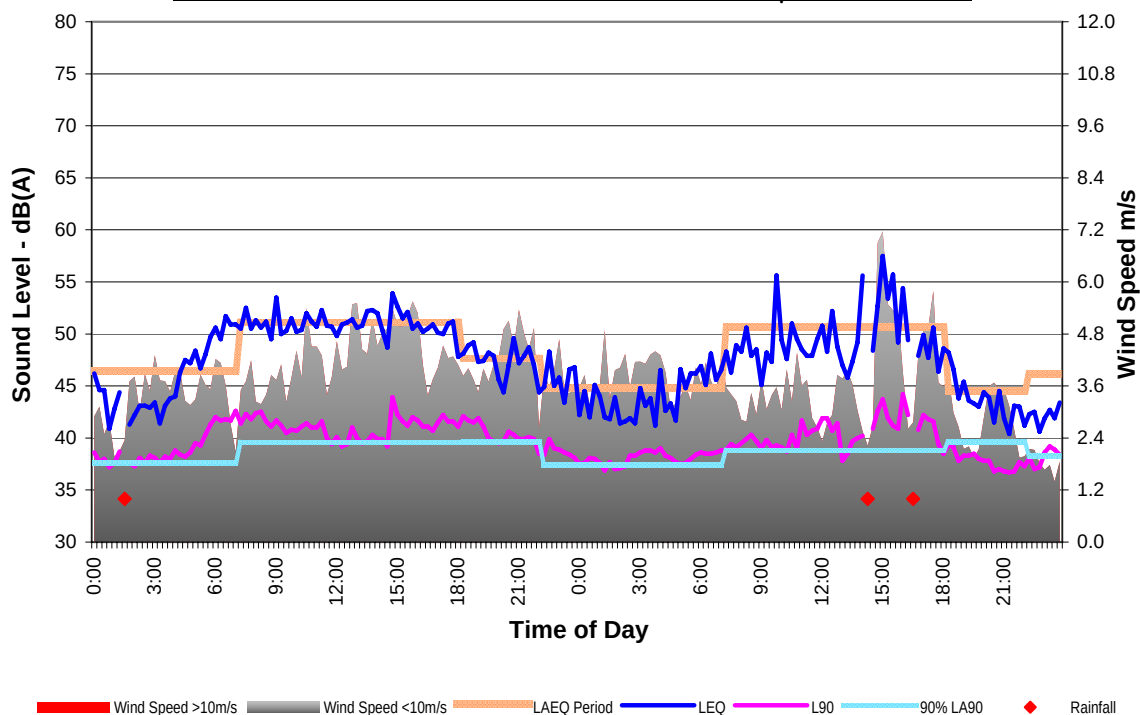
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 18 to 19 September 2019



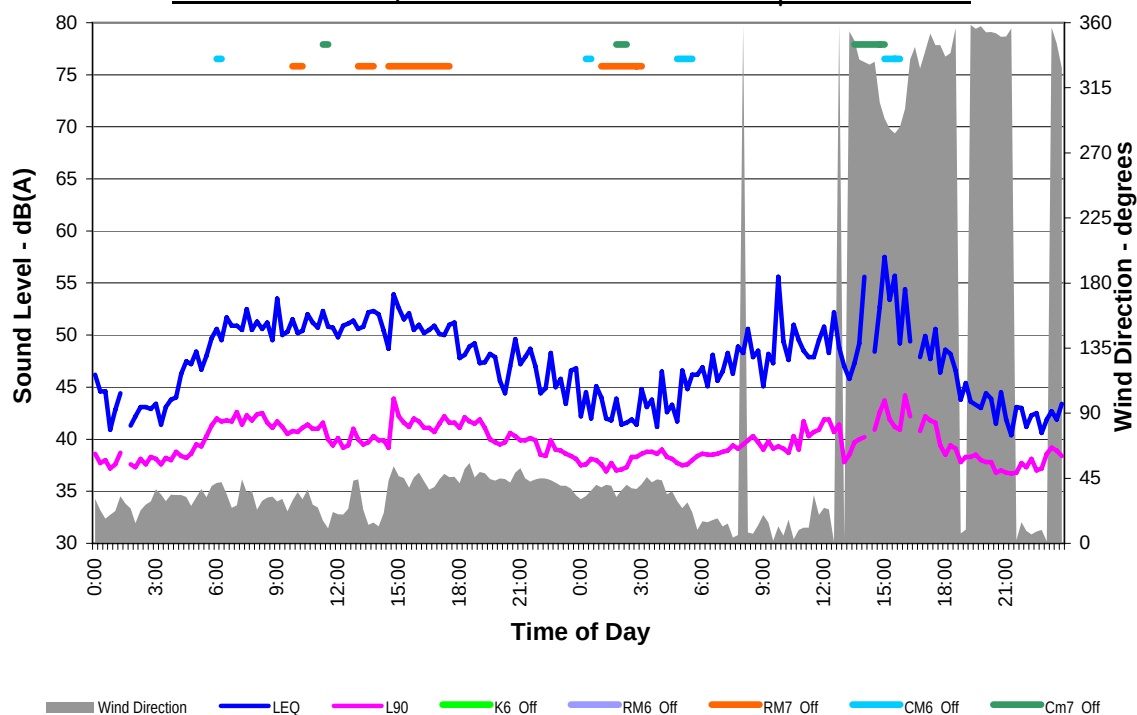
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 20 to 21 September 2019



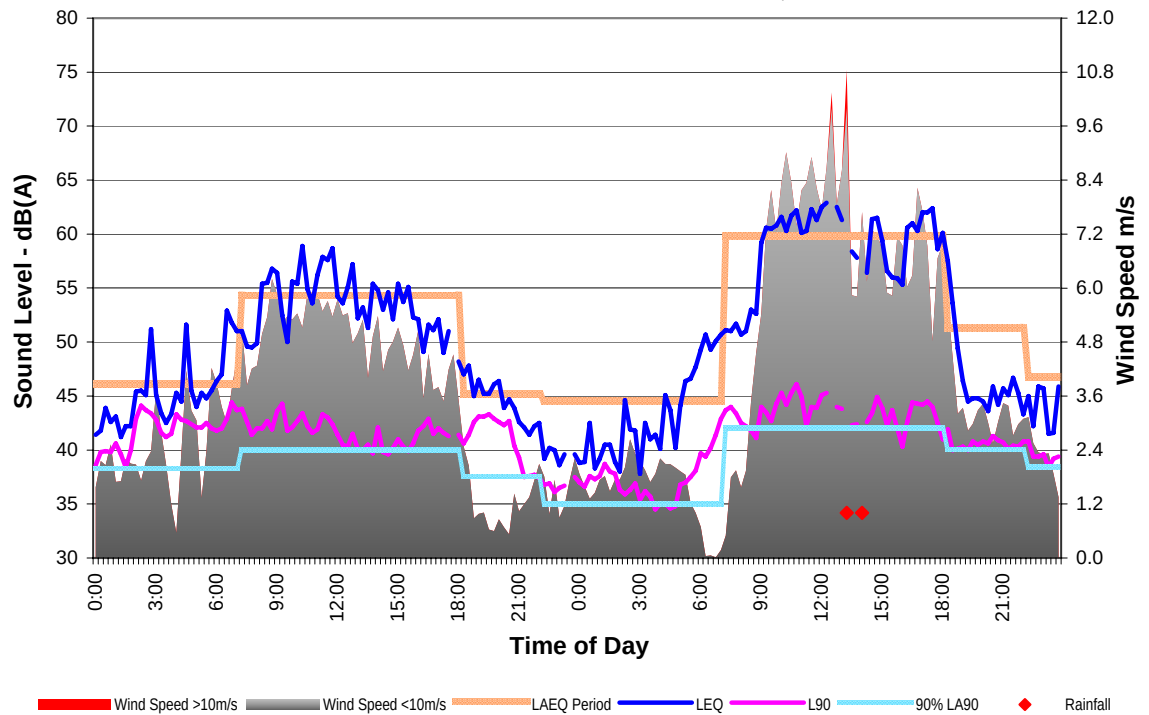
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 20 to 21 September 2019



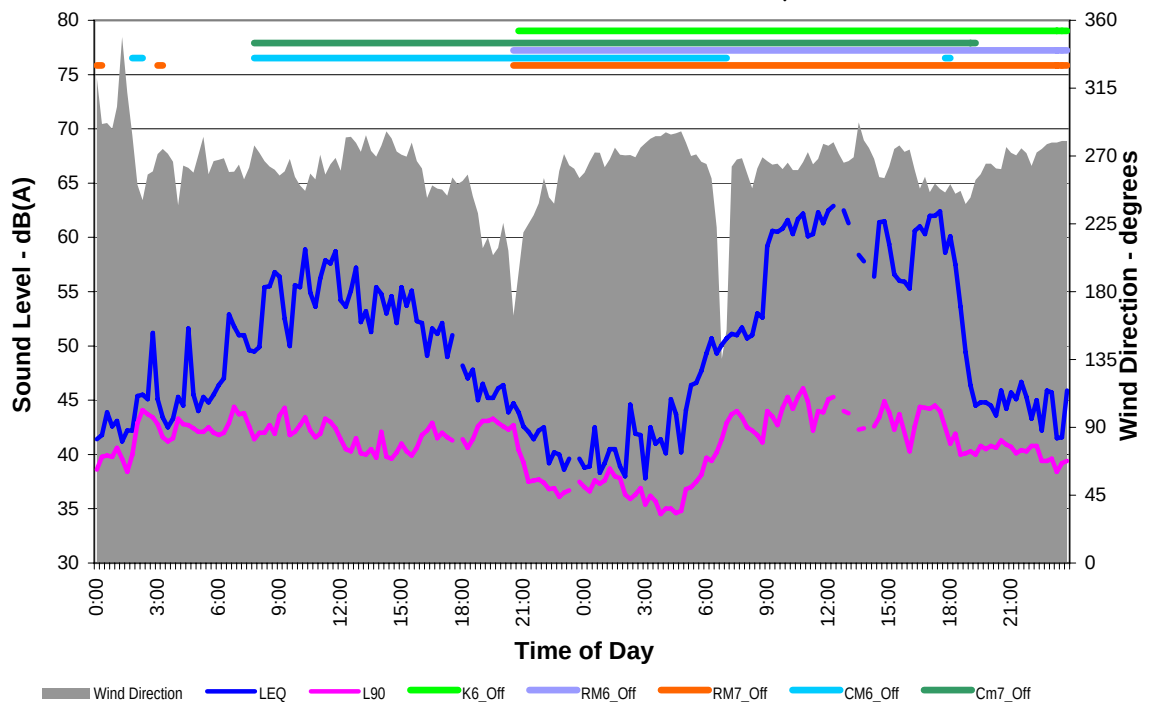
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 22 to 23 September 2019



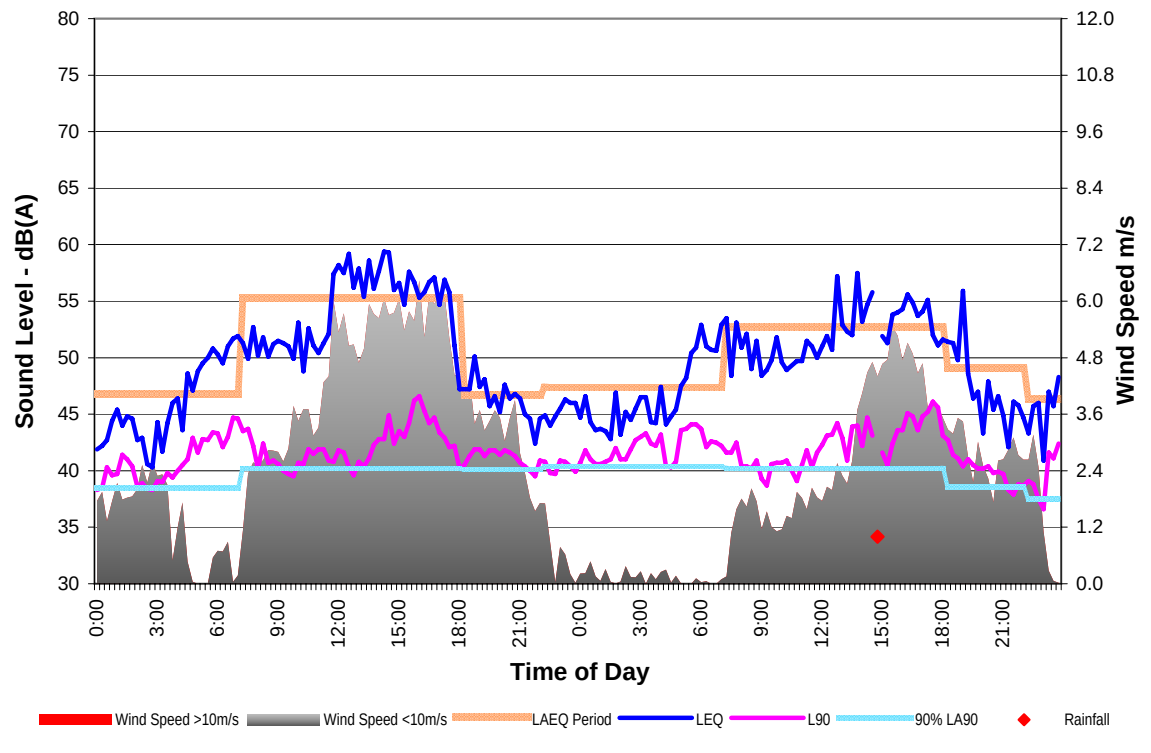
Berrima Cement Works - Ambient - Background Noise Survey

4 Melbourne St., New Berrima - 22 to 23 September 2019



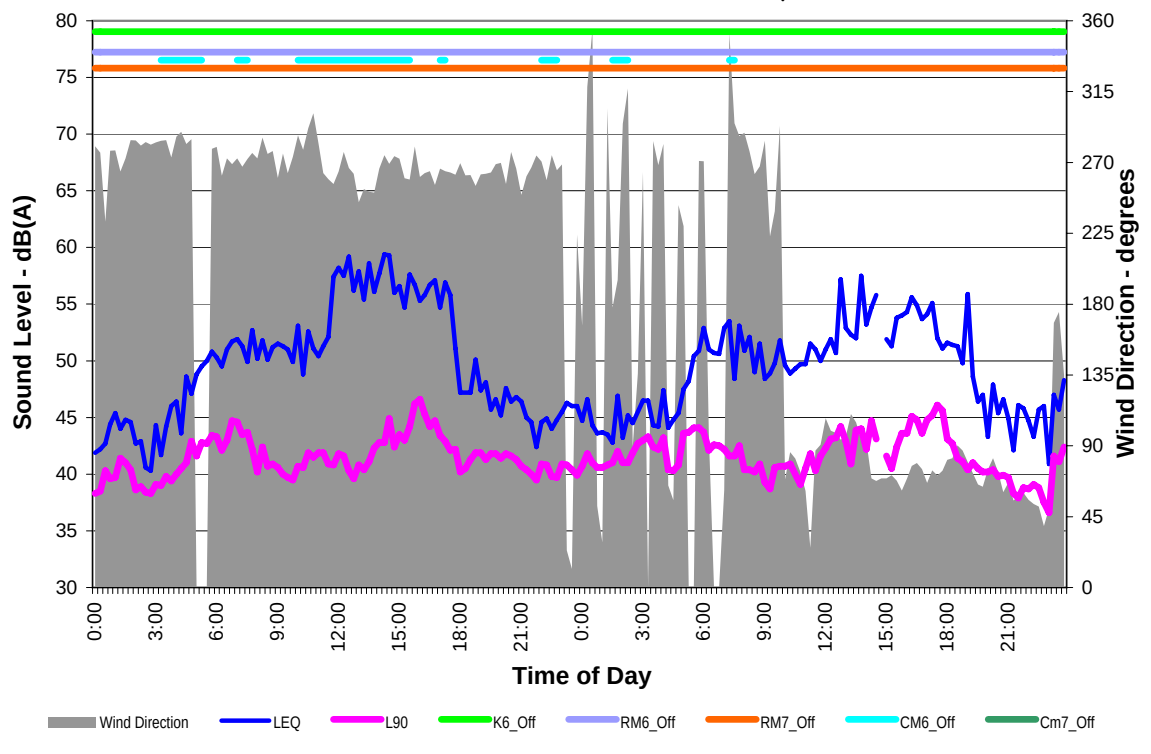
Berrima Cement Works - Ambient - Background Noise Survey

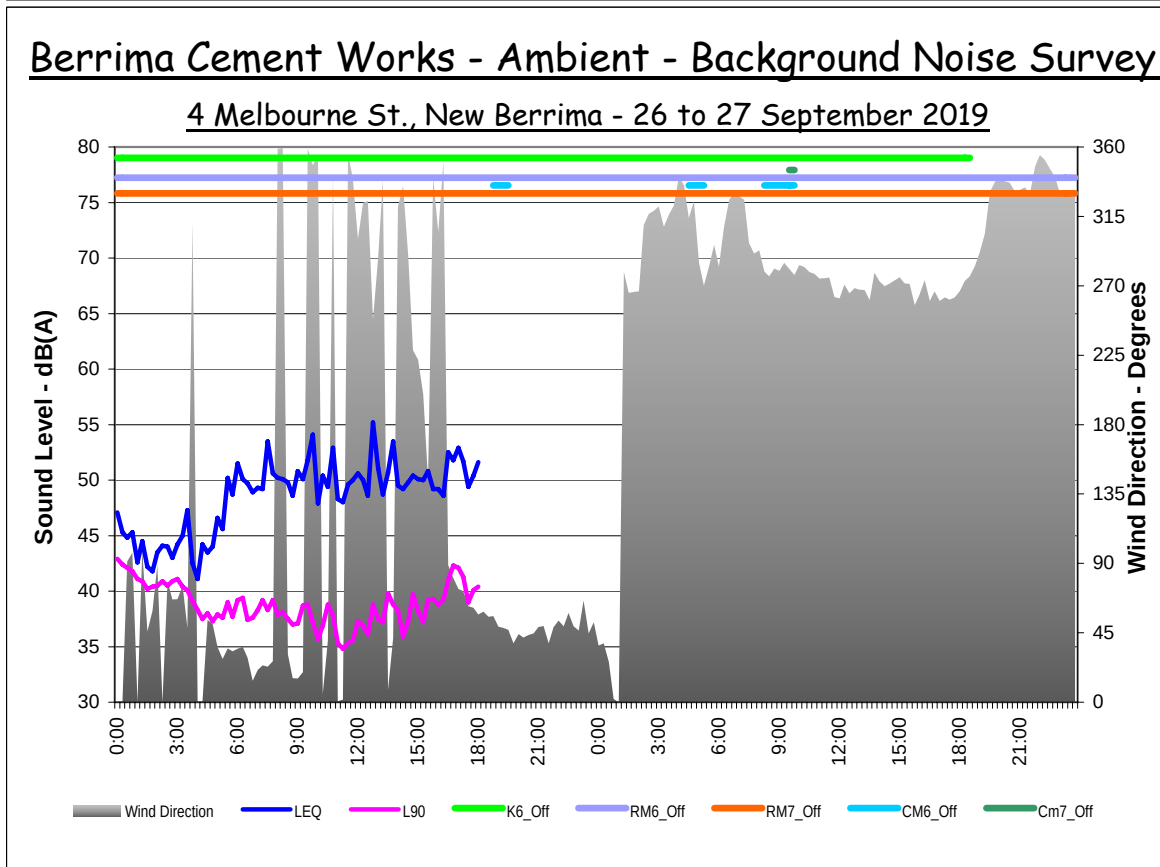
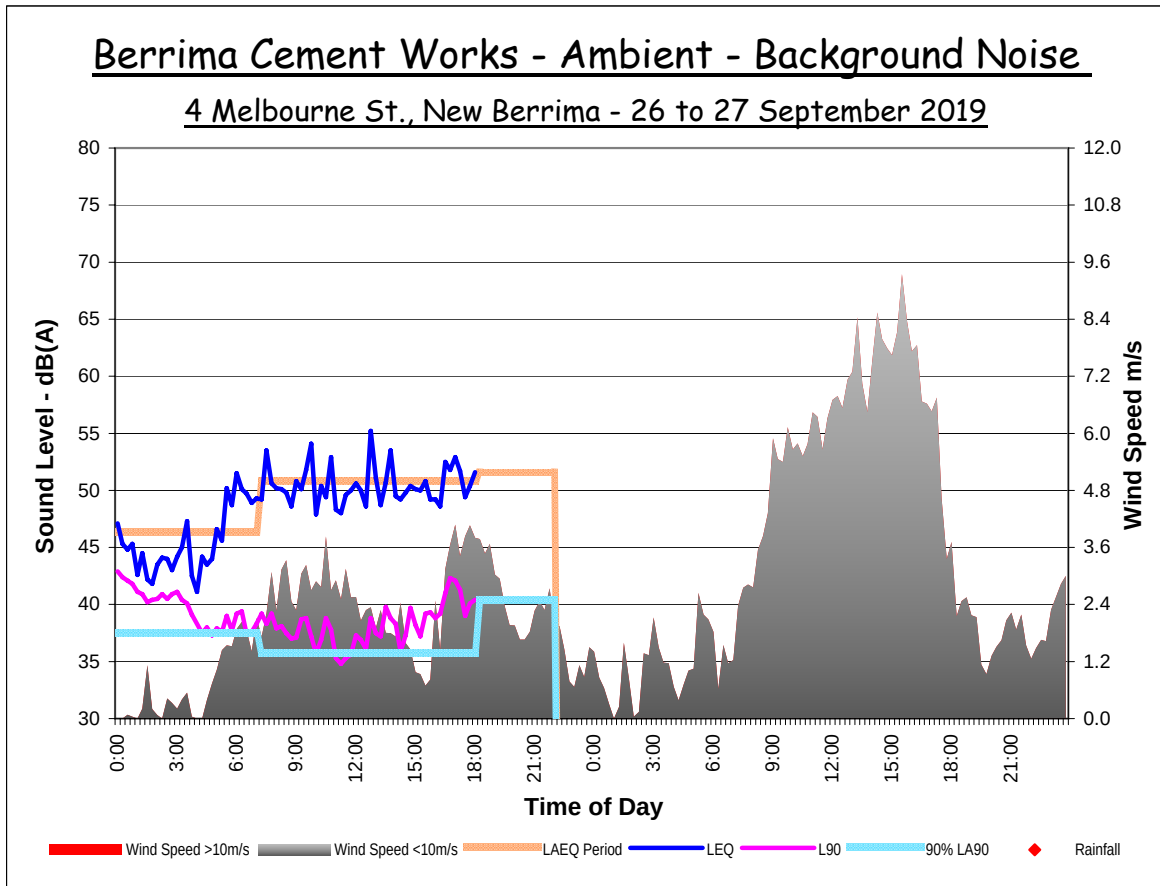
4 Melbourne St., New Berrima - 24 to 25 September 2019



Berrima Cement Works - Ambient - Background Noise Survey

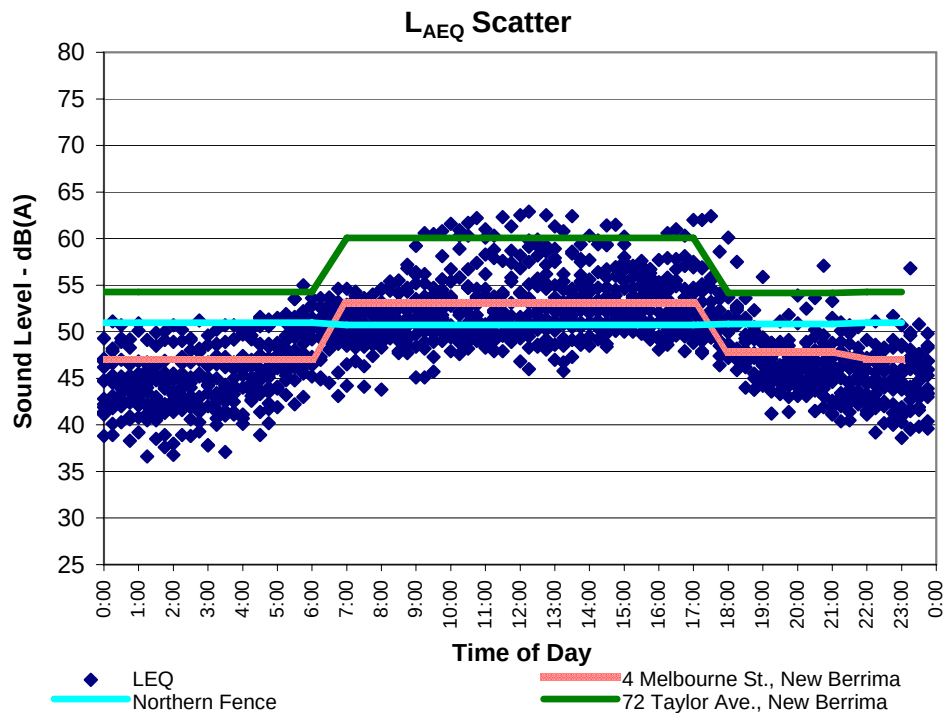
4 Melbourne St., New Berrima - 24 to 25 September 2019





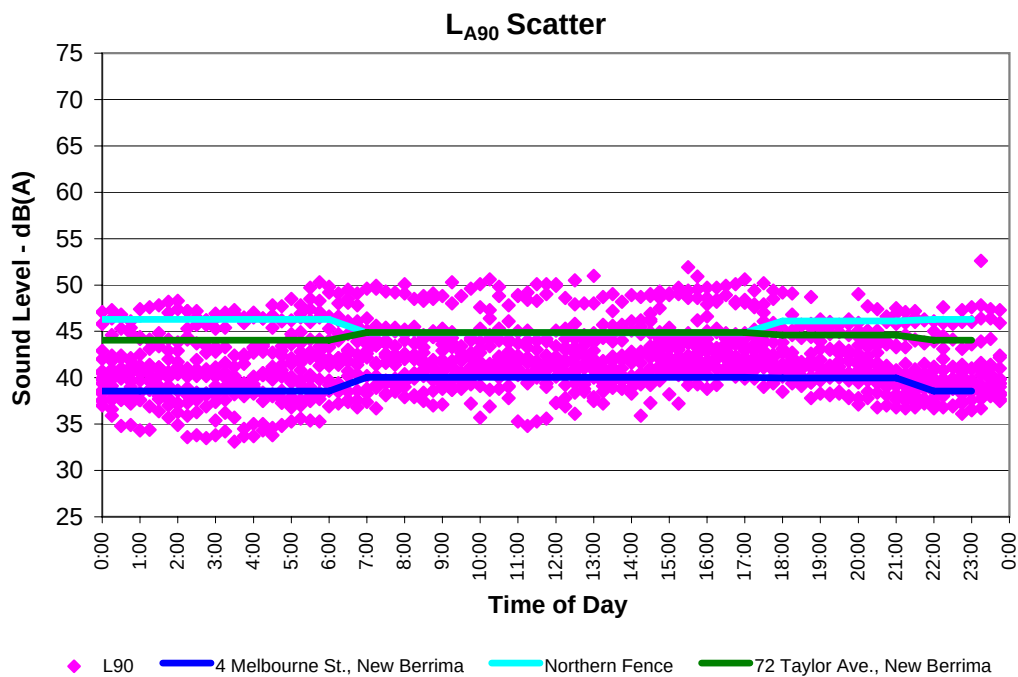
Berrima Cement Works - Ambient - Background Noise

4 Melbourne St., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

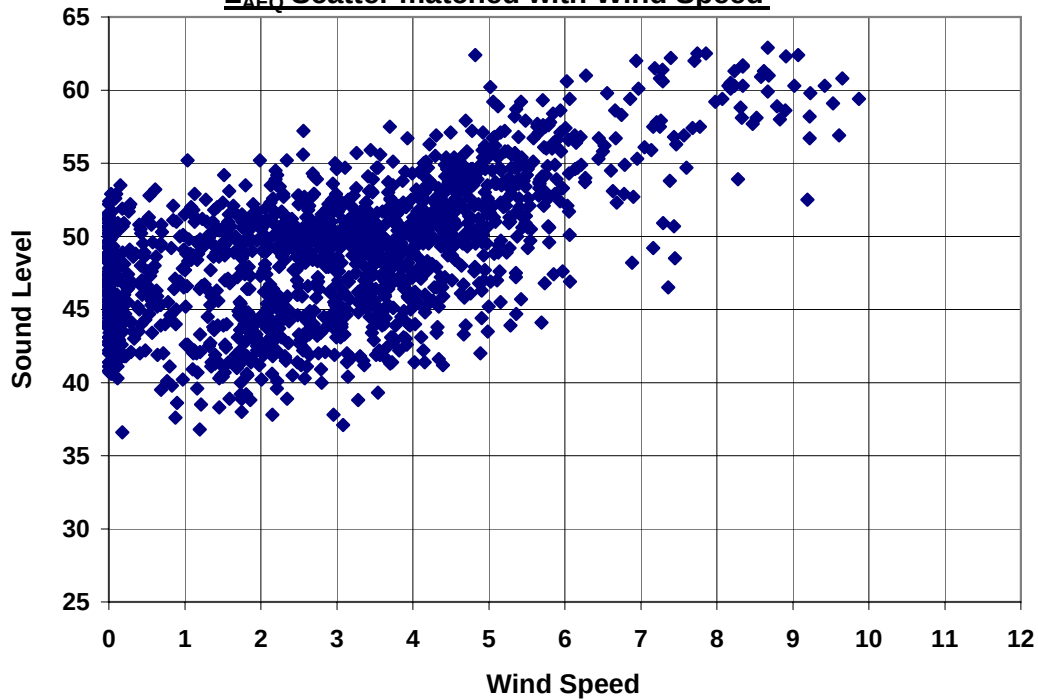
4 Melbourne St., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

4 Melbourne St., New Berrima - 10 September to 2 October 2019

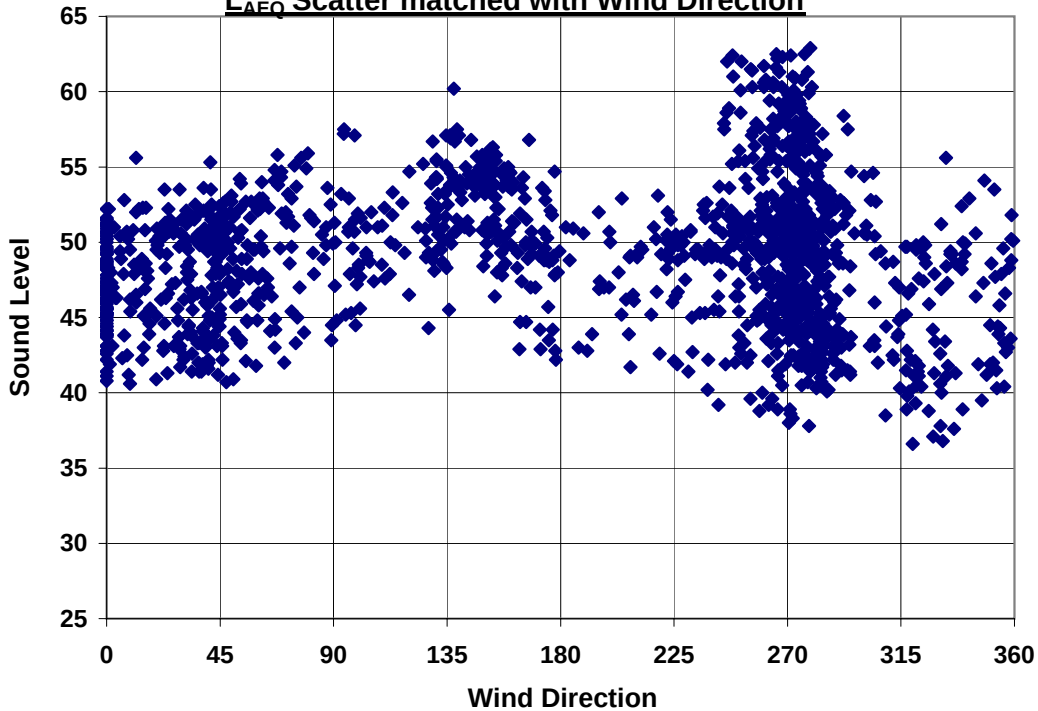
L_{AEQ} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

4 Melbourne St., New Berrima - 10 September to 2 October 2019

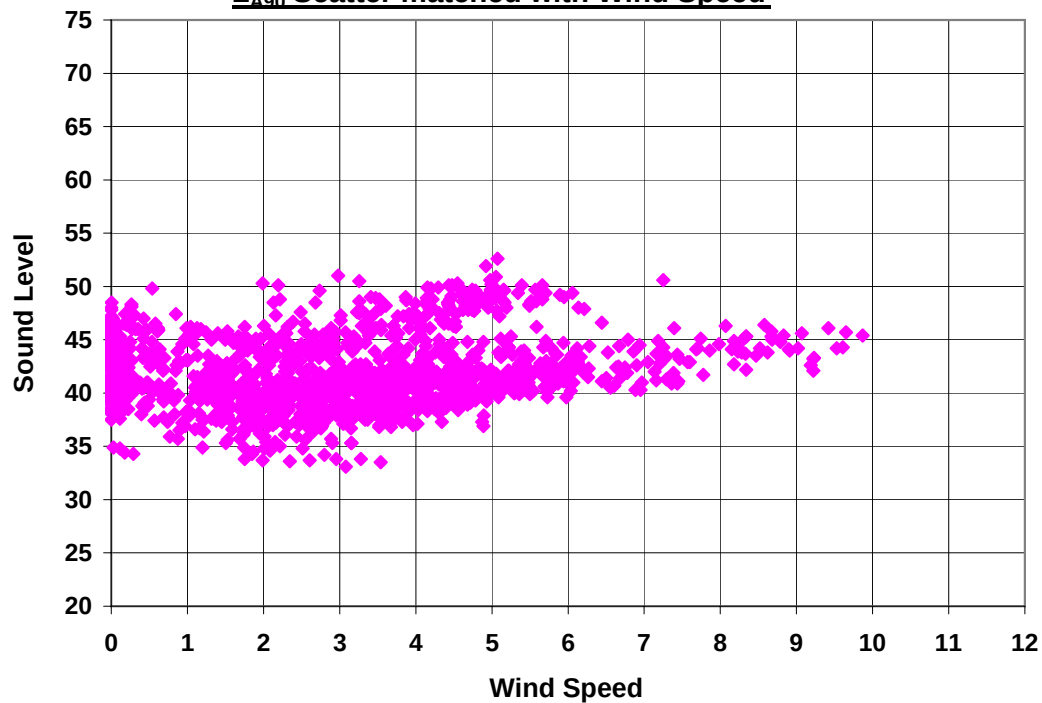
L_{AEQ} Scatter matched with Wind Direction



Berrima Cement Works - Ambient - Background Noise

4 Melbourne St., New Berrima - 10 September to 2 October 2019

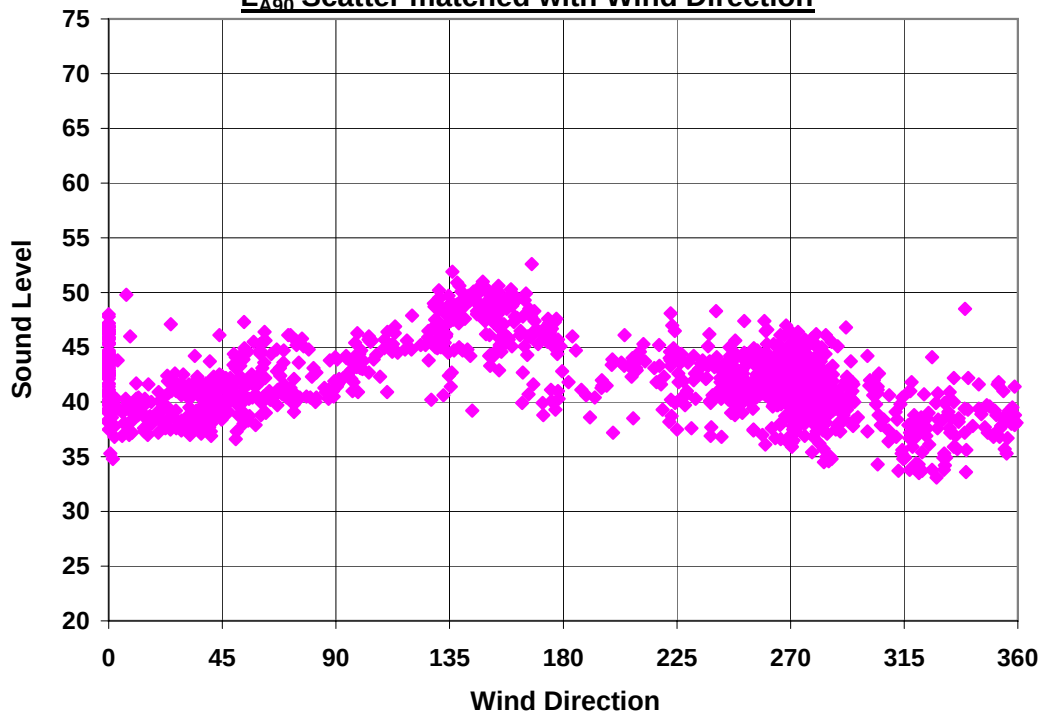
L_{A90} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

4 Melbourne St., New Berrima - 10 September to 2 October 2019

L_{A90} Scatter matched with Wind Direction



Appendix C: Unattended environmental sound level results for 72 Taylor Avenue

72 Taylor Ave., New Berrima
Daytime LAEQ 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
7:00		61	64	59	55	50	58		62	61	60	55	54	60	64	50	58	3.9
7:15		57	60	61	56	55	56	61	62	61	60	57	52	61	62	52	58	3.1
7:30		66	61	57	56	52	60		61	60	62	55	51	60	66	51	59	4.3
7:45		58	58	58	56	56	57		63	61	60	58	53	62	63	53	58	2.8
8:00		61	67	59	56	52	60	62	68	61	60	59	52	59	68	52	60	4.5
8:15		61	66	59	58	58	58		63	61	60	57	54	61	66	54	60	3.1
8:30		60	60	60	57	54	58	62	62	61	60	56	53	59	62	53	59	2.8
8:45		60	66	60	55	57	58	62	63	61	59	58	54	60	66	54	59	3.2
9:00		61	60	63	57	64	60		65	63	61	53	56	61	65	53	60	3.5
9:15		62	60	60	59	52	59	62	62	64	59	55	54	60	64	52	59	3.4
9:30		59	60	62	57	53	63		62	61	60	57	56	60	63	53	59	3.1
9:45		60	59	61	56	74	57		62	61	60	66	59	62	74	56	61	4.7
10:00		59	61	58	59	67	59	61	62	65	59	59	63	61	67	58	61	2.5
10:15		59	60	65	57	75	61	59	63	60	61	57	56	58	75	56	61	4.9
10:30		61	61	58	56	75	58	63	62	60	62	58	55	60	75	55	61	5.0
10:45		65	61	59	56	58	63		62	62	60	58	56	60	65	56	60	2.7
11:00		59	61	59	57	55	58	61	62	60	59	59	56	57	62	55	59	2.2
11:15		61	60	59	57	54	59	63	61	59	63	60	57	58	63	54	59	2.6
11:30		61		61	56	57	59	61	62	59	61	60	56	59	62	56	59	2.2
11:45		59		60	57	55	60	62	67	60	62	59	56	61	67	55	60	3.2
12:00		64		57	55	54		61	64	60	59	61	56	59	64	54	59	3.3
12:15		59	61	65	56	54	62		63	59	61	56	54	58	65	54	59	3.5
12:30		59	60	58	59	55	59	63	64	60	59	54	57		64	54	59	2.7
12:45	66	60	61	60	57	53	61		61	60	59	59	58	60	66	53	60	2.8
13:00	62	59	60	60	60	54	59	62	61	61	59	56	56	60	62	54	59	2.3
13:15	61	62	60	58	55	54	59		65	62	61	54	56		65	54	59	3.6
13:30	59	60	64	66	57	55	59	62	61	62	60	56	56	57	66	55	59	3.1
13:45	66	61	62	57	56	55	59		62	64	60	57	54	59	66	54	59	3.5
14:00	61	60	61	58	61	55	59		62	61	60	60	56		62	55	59	2.1
14:15	60	60	59	60	56	55	61		62		60		54	58	62	54	59	2.6
14:30	58	61	62	60	55	56	66	61	61	61	58	56	57	57	66	55	59	2.9
14:45	59	58	61	61	56	56	68	60	62	59	60	56	54	59	68	54	59	3.3
15:00	60	59	60	59	56	56	67		62	61	59	57	54	59	67	54	59	3.2
15:15	60	60	60	59	56	55	60		62	64	61	56	55	58	64	55	59	2.9
15:30	61	60	61	59	57	54	62	62	62	59	60	57	58	62	62	54	60	2.3
15:45	59	61	59	59	56	55	60	62	62	62	59	54	57	60	62	54	59	2.5
16:00	59	56	59	59	55	57	60	62	62	60	58	55	57	57	62	55	58	2.4
16:15	59	59	60	57	55	56	59	62	61	60	59	56	58	60	62	55	59	1.9
16:30	59	60	58	58	56	54	60		61	61	59		56	59	61	54	58	2.3
16:45	59	58	59	57	55	55	60	63	60	58	59	53	55	61	63	53	58	2.7
17:00	60	59	57	61	56	54	59	62	60	58	58	55	55	60	62	54	58	2.4
17:15	59	62	60	58	54	54	59	60	61	58	59	54	55	60	62	54	58	2.8
17:30	59	60	61	59	55	56	59	63	60	58	58	55	55	58	63	55	58	2.4
17:45	59	59	59	56	55	54	59	60	59	58	59	52	54	58	60	52	57	2.6
18:00	57	56	56	56	54	56	57	61	59	56	56	52	54	57	61	52	56	2.0
Max	66	66	67	66	61	75	68	63	68	65	63	66	63	62	75	61	66	3.5
Min	57	56	56	56	54	50	56	59	59	56	56	52	51	57	59	50	55	2.6
Ave	60	60	60	59	56	57	60	62	62	60	60	57	55	59	62	55	59	2.1
SD	2.1	1.9	2.1	2.2	1.5	5.6	2.4	1.0	1.7	1.8	1.3	2.6	2.0	1.4	5.6	1.0	2.1	1.1
E Ave	61	60	61	60	57	64	61	62	62	61	60	58	56	60	64	56	60	2.2

Evening LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
18:00	57	56	56	56	54	56	57	61	59	56	56	52	54	57	61	52	56	2.0
18:15	58	56	58	61	53	54	59	60	59	62	55	54	56	56	62	53	57	2.7
18:30	56	56	57	56	54	51	56		57	54	55	54	56	55	57	51	55	1.6
18:45	57	56	56	55	53	52	56	58	59	55	55	50	52	55	59	50	55	2.5
19:00	55	54	54	53	55	52	55		53	55	53	51	55	53	55	51	54	1.3
19:15	56	55	53	53	52	47	54		56	52	55	49	52	52	56	47	53	2.5
19:30	57	53	54	55	51	52	56		56	52	54	49	52	53	57	49	53	2.2
19:45	55	56	56	53	52	50	58		56	55	52	48	54	53	58	48	54	2.7
20:00	51	57	52	51	52	51	56	58	53	52	51	51	53	52	58	51	53	2.6
20:15	54	54	55	53	51	52	53	59	55	51	49	52	50	50	59	49	53	2.7
20:30	53	53	60	53	53	49	51	56	54	53	54	50	51	54	60	49	53	2.6
20:45	54	55	56	54	49	51	53	57	54	49	52	49	51	53	57	49	53	2.5
21:00	52	50	56	52	49	49	55	57	54	52	52	50	50	54	57	49	52	2.6
21:15	53	58	55	55	50	50	55	57	55	49	54	48	51	53	58	48	53	3.0
21:30	54	52	52	51	48	48	55	55	57	48	53	52	50	56	57	48	52	3.0
21:45	54	54	54	53	49	51		57	53	53	53	51	49	53	57	49	53	2.2
22:00	53	50	53	56	46	48		56	56	46	51	49	48	49	56	46	50	3.4
Max	58	58	60	61	55	56	59	61	59	62	56	54	56	57	62	54	58	2.4
Min	51	50	52	51	46	47	51	55	53	46	49	48	48	49	55	46	50	2.7
Ave	55	54	55	54	51	51	55	58	56	53	53	51	52	53	58	51	54	2.1
SD	2.0	2.3	2.0	2.3	2.4	2.3	2.0	1.7	2.1	3.7	1.7	1.8	2.4	2.0	3.7	1.7	2.2	0.5
E Avg	55	55	56	55	52	51	56	58	56	54	53	51	53	54	58	51	54	2.0

Night LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD		
22:00	53	50	53	56	46	48	61	57	56	46	51	49	48	49	56	46	50	3.4		
22:15	54	52	52	55	48	49			57	55	48	52	52	45	53	57	45	52	3.4	
22:30	53	52	53	51	49	53			56	54	55	49	48	48	56	48	52	2.6		
22:45	57	53	50	53	48	48			57	55	50	52	49	48	57	57	48	52	3.5	
23:00	54	53	52	50	48	47			57	53	54	55	49	47	55	57	47	52	3.5	
23:15	51	54	56	58	49	44	55	58	53	51	49	49	49	49	61	44	52	4.6		
23:30	51	53	54	53	49	45			57	51	52	54	49	46	48	57	45	51	3.5	
23:45	54	52	55	53	51	45			58	53	48	54	49	47	55	58	45	52	3.7	
0:00	47	50	51	52	46	50			56	50	55	50	46	47	49	56	46	50	3.2	
0:15	49	54	54	51	47	48			59	51	52	52	46	46	50	59	46	51	3.7	
0:30	53	53	54	50	51	50	56	57	53	52	46	48	52	49	57	46	51	2.8		
0:45	49	55	53	54	48	49			56	51	45	52	49	45	52	56	45	51	3.6	
1:00	51	47	52	51	46	50			57	53	50	48	50	47	52	57	46	50	3.0	
1:15	50	54	53	49	49	41			58	53	52	48	45	50	51	58	41	50	4.2	
1:30	50	45	53	51	49	44			58	54		46	48	49	52	58	44	50	4.1	
1:45	52	54	56	48	49	42	58	51	48	45	51	48	45	53	58	42	50	4.6		
2:00	53	54	58	48	48	42			58	48	49	50	44	49	58	42	50	4.7		
2:15	53	50	57	49	47	48			58	52	50	46	51	53	51	58	46	51	3.5	
2:30	54	52	55	52	47	41			58	49	50	46	49	50	46	58	41	50	4.4	
2:45	53	50	55	48	49	43			57	50	48	45	57	49	46	57	43	50	4.3	
3:00	52	51	57	48	47	47	54	59	51	49	51	49	45	52	58	45	51	3.8		
3:15	50	46	55	47	47	48			58	51	44	46	48	50	49	58	44	49	4.1	
3:30	54	52	55	47	46	41			58		50	50	48	50	52	58	41	50	4.6	
3:45	61	54	57	46	56	49			58		50	45	49	52	54	61	45	52	5.0	
4:00	56	55	57	49	45	61			59	58	51	48	51	48	54	61	45	53	4.8	
4:15	55	56	56	49	49	53	56	60	56	54	49	50	57	47	59	47	53	3.9		
4:30	57	57	55	49	48	45			59	54	58	50	48	53	57	60	45	53	4.7	
4:45	57	56	50	52	49	55			54	59	59	54	52	50	49	53	59	49	53	3.4
5:00	57	54	55	54	48	53			54	60	55	57	53	50	54	57	60	48	54	3.0
5:15	60	58	57	55	51	57			62	59	53	55	51	53	57	58	60	51	56	2.8
5:30	58	59	60	56	50	58	61	60			56	55	51	57		62	50	57	3.6	
5:45	61	57	59	53	49	58	63	59			58	55	50	57		63	49	56	4.1	
6:00	59	60	60	55	51	59	61	59			59	57	49	60		61	49	57	3.9	
6:15	60	58	59	57	52	56	61	60			57	54	52	61		61	52	57	3.3	
6:30	61	60	60	54	53	58	61	61	61	53	51	57		61	51	57	3.7			
6:45	59	61	59	56	48	60			61	59	53	53	59		61	48	57	4.0		
7:00	61	64	59	55	50	58			62	61	60	55	54	60		64	50	58	3.9	
Max	61	64	60	58	56	61			62	63	61	61	57	57	61	58	64	56	60	2.4
Min	47	45	50	46	45	41			54	56	48	44	45	45	44	46	56	41	47	4.2
Ave	55	54	55	52	49	50	57	59	54	52	51	50	51	52	59	49	53	3.0		
SD	3.9	4.1	2.8	3.2	2.2	5.9	3.4	1.7	3.7	4.6	3.3	2.3	4.9	3.3	5.9	1.7	3.5	1.2		
E Avg	56	56	56	53	49	53	58	59	56	54	52	50	49	53	59	49	54	2.8		
24hr	58	59	59	58	55	61	59	60	61	59	58	55	54	57	61	53	58	2.5		

72 Taylor Ave., New Berrima
Daytime LA90 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
7:00		51	49	49	49	46	42		56	48	46	43	48	48	56	42	48	3.6
7:15		49	48	48	49	45	41	54	57	49	46	44	49	49	57	41	48	4.0
7:30		47	49	48	48	45	43		56	47	47	44	47	48	56	43	47	3.4
7:45		46	49	49	49	45	42		57	48	46	44	46	48	57	42	47	3.6
8:00		46	49	49	49	45	43	53	56	48	46	44	47	47	56	43	48	3.7
8:15		46	48	48	50	46	43		56	48	46	44	47	48	56	43	47	3.2
8:30		46	49	48	50	46	43	54	55	47	47	43	47	47	55	43	48	3.5
8:45		46	49	50	50	45	44	54	55	48	45	44	47	47	55	44	48	3.6
9:00		45	48	48	50	44	45		54	47	46	44	47	48	54	44	47	2.9
9:15		45	48	48	50	45	46	54	54	47	45	44	47	48	54	44	48	3.3
9:30		45	47	47	48	45	45		55	46	45	44	46	48	55	44	47	3.0
9:45		46	50	47	49	46	46		55	46	45	44	46	48	55	44	47	3.1
10:00		46	49	47	49	46	46	52	56	46	46	44	48	50	56	44	48	3.2
10:15		46	51	46	49	63	47	53	56	45	47	44	47	49	63	44	49	5.2
10:30		46	50	46	48	46	46	55	56	45	46	44	46	50	56	44	48	3.6
10:45		46	49	47	50	45	48		54	45	47	44	47	49	54	44	48	2.8
11:00		46	51	45	49	46	47	54	54	45	46	43	47	48	54	43	48	3.5
11:15		46	51		46	49	44	45	55	54	44	46	49	48	55	44	48	3.5
11:30		46		46	48	46	45	56	55	44	45	47	47	50	56	44	48	3.7
11:45		46		46	49	45	48	55	55	44	44	50	47	48	55	44	48	3.8
12:00		46		45	49	43		55	55	46	46	46	46	49	55	43	48	3.9
12:15		46	49	47	47	43	49		55	46	45	45	46	50	55	43	47	3.3
12:30		47	49	45	48	44	48	55	54	45	45	44	45		55	44	47	3.7
12:45	48	46	50	46	48	44	48		55	45	46	44	46	47	55	44	47	3.0
13:00	49	47	50	46	48	44	48	54	55	46	46	44	46	49	55	44	48	3.5
13:15	49	47	52	44	46	44	46		55	46	45	44	45		55	44	47	3.6
13:30	49	47	50	45	46	45	46	54	54	45	45	43	45	46	54	43	47	3.6
13:45	50	47	51	45	46	45	48		55	45	45	43	44	47	55	43	47	3.3
14:00	49	45	50	45	47	46	47		55	45	46	44		45	55	44	47	3.3
14:15	50	45	48	44	47	46	52		55		46		45	47	55	44	47	3.3
14:30	49	46	50	46	49	46	52	54	54	46	44	45	45	48	54	44	48	3.5
14:45	48	46	50	45	47	47	52	54	55	46	47	47	44	49	55	44	48	3.3
15:00	49	46	49	48	48	46	54		55	47	46	47	45	47	55	45	48	3.0
15:15	49	47	49	47	47	46	55		55	47	46	46	44	47	55	44	48	3.4
15:30	50	45	50	47	47	46	54	57	56	45	46	47	45	48	57	45	48	4.2
15:45	50	46	49	47	46	47	54	56	54	47	46	46	46	47	56	46	49	3.8
16:00	49	45	48	47	47	48	53	56	55	45	46	47	46	46	56	45	48	3.8
16:15	49	46	48	49	47	47	53	56	55	47	47	45	47	47	56	45	49	3.6
16:30	48	46	49	48	47	46	54		54	48	45		47	48	54	45	48	3.1
16:45	49	45	49	47	46	46	53	56	54	46	45	45	47	49	56	45	48	3.7
17:00	49	45	48	46	46	46	54	56	53	46	46	45	47	51	56	45	48	3.8
17:15	49	46	48	46	46	46	54	55	54	47	46	46	47	49	55	46	48	3.5
17:30	50	46	48	47	46	46	54	57	54	46	46	47	46	49	57	46	49	3.8
17:45	51	45	48	46	47	46	54	55	53	45	45	44	47	48	55	44	48	3.7
18:00	50	45	47	46	47	46	48	56	51	44	44	43	47	48	56	43	47	3.3
Max	51	51	52	50	50	63	55	57	57	49	47	50	49	51	63	47	52	4.2
Min	48	45	47	44	46	43	41	52	51	44	44	43	44	46	52	41	45	3.1
Ave	49	46	49	47	48	46	48	55	55	46	46	45	46	48	55	45	48	3.1
SD	0.8	1.1	1.1	1.4	1.4	2.8	4.2	1.2	1.0	1.2	0.7	1.7	1.1	1.2	4.2	0.7	1.5	0.9
90%	48	45	48	45	46	44	43	53	54	45	45	43	45	47	54	43	46	3.5
																Median	45	

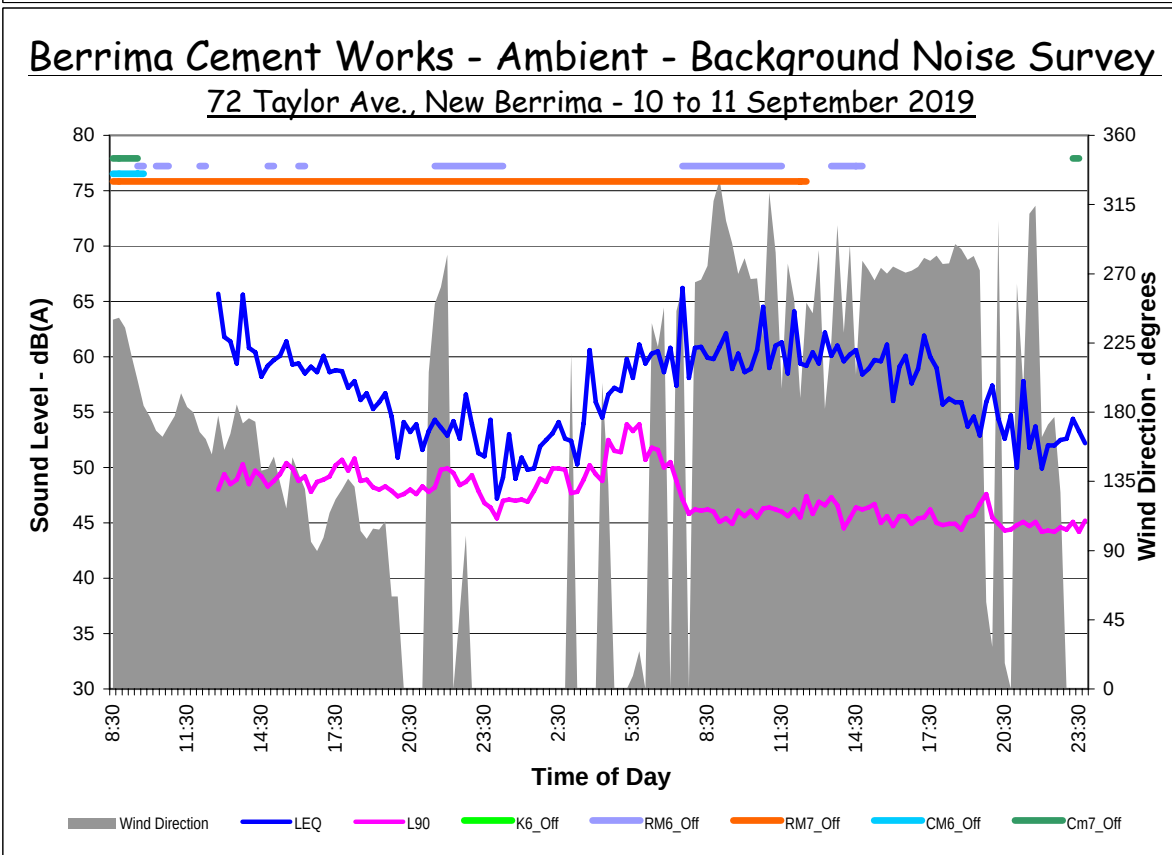
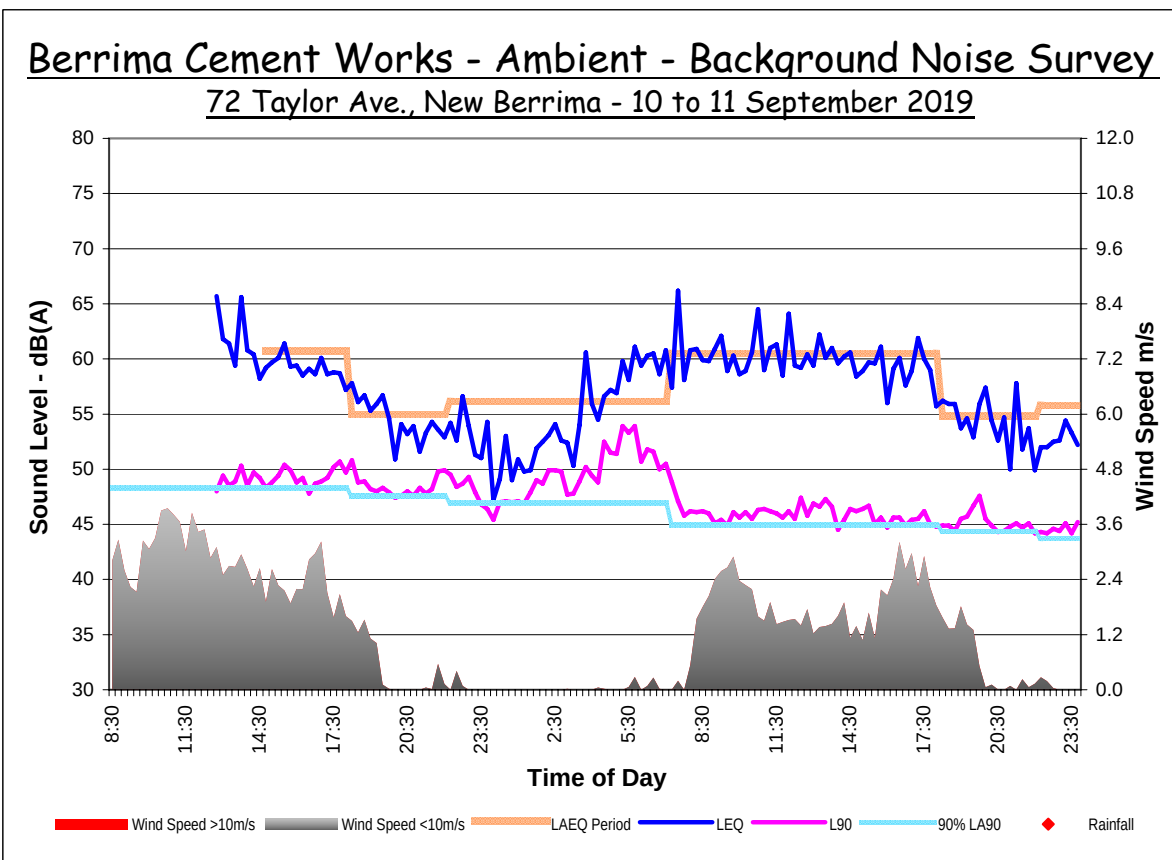
Evening LA90

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
18:00	50	45	47	46	47	46	48	56	51	44	44	43	47	48	56	43	47	3.3
18:15	51	45	47	46	48	46	52	56	52	44	45	44	46	47	56	44	47	3.6
18:30	49	45	47	46	48	45	49		52	44	44	42	47	46	52	42	46	2.4
18:45	49	44	46	45	47	45	50	54	52	45	44	42	47	46	54	42	47	3.4
19:00	48	46	46	46	47	45	51		50	44	44	43	48	46	51	43	46	2.5
19:15	48	46	46	46	46	43	48		50	44	44	43	48	45	50	43	46	2.2
19:30	48	47	46	46	46	43	50		50	43	43	42	48	46	50	42	46	2.5
19:45	48	48	48	45	47	44	51		51	44	43	42	48	46	51	42	46	2.9
20:00	47	46	47	45	46	44	52	55	50	44	43	42	47	46	55	42	47	3.6
20:15	48	45	48	45	45	44	50	54	49	43	43	42	47	46	54	42	46	3.3
20:30	48	44	48	44	44	44	46	52	48	43	44	42	47	46	52	42	46	2.8
20:45	48	44	49	45	43	43	50	53	49	42	44	42	47	46	53	42	46	3.3
21:00	48	45	50	45	43	43	53	53	49	43	44	42	45	46	53	42	46	3.8
21:15	48	45	51	46	42	43	52	53	49	42	44	42	43	45	53	42	46	4.0
21:30	48	45	50	46	42	42	52		52	50	41	43	42	43	45	52	41	3.9
21:45	50	45	48	47	43	42		52	50	43	44	42	43	45	52	42	45	3.4
22:00	50	44	50	47	42	42			49	43	43	42	43	46	50	42	45	2.9
Max	51	48	51	47	48	46	53	56	52	45	45	44	48	48	56	44	49	3.5
Min	47	44	46	44	42	42	46	52	48	41	43	42	43	45	52	41	45	3.0
Ave	49	45	48	46	45	44	50	54	50	43	44	42	46	46	54	42	47	3.2
SD	1.0	0.9	1.6	0.7	2.1	1.2	1.9	1.4	1.1	0.9	0.5	0.6	1.9	0.8	2.1	0.5	1.2	0.5
90%	48	44	46	45	42	42	48	52	49	42	43	42	43	45	52	42	45	3.1
																Median	45	

Night LA90

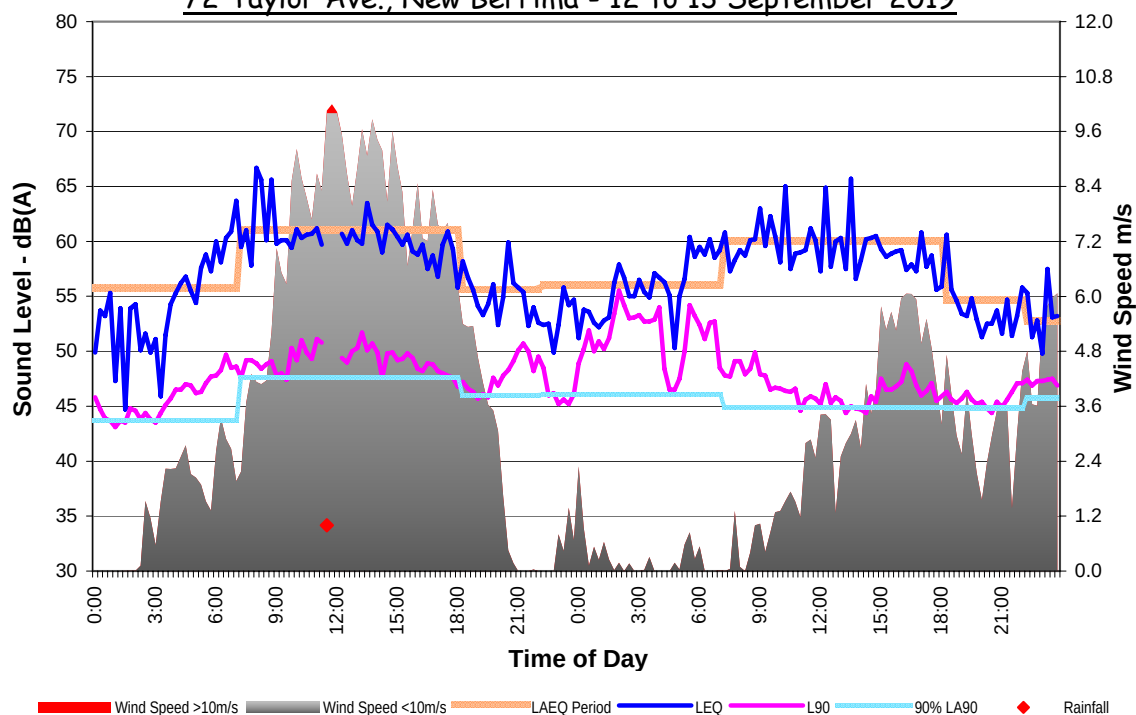
Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD										
22:00	50	44	50	47	42	42	56	54	49	43	43	42	43	46	50	42	45	2.9										
22:15	50	44	49	47	42	43			50	43	43	42	43	46	54	42	45	3.7										
22:30	48	44	46	47	42	43			49	43	44	41	42	45	49	41	44	2.3										
22:45	49	45	46	47	42	43			54	48	43	42	41	42	45	54	41	45	3.6									
23:00	49	44	45	47	42	42			53	49	43	42	43	42	45	53	42	45	3.4									
23:15	48	45	46	47	44	42			54	49	43	43	43	43	45	56	42	46	4.5									
23:30	47	44	45	48	44	43			53	49	43	43	43	43	45	53	43	45	3.2									
23:45	46	45	46	47	44	42			54	47	42	42	44	44	45	54	42	45	3.3									
0:00	45	46	49	47	44	42			54	47	42	42	44	44	44	54	42	45	3.6									
0:15	47	45	50	47	45	41			54	48	42	42	45	43	45	54	41	45	3.7									
0:30	47	44	52	47	45	41	54	48	42	42	45	44	46	54	41	46	3.9											
0:45	47	44	50	47	45	41	54	49	41	42	45	44	45	54	41	46	4.0											
1:00	47	43	51	48	45	40	55	48	42	42	45	44	46	55	40	46	4.2											
1:15	47	44	50	47	47	40	56	47	43	42	44	45	46	56	40	46	4.3											
1:30	48	44	51	47	47	41	56	47		42	44	44	46	56	41	46	4.3											
1:45	49	45	53	47	46	41	55	47	41	42	44	44	46	55	41	46	4.4											
2:00	49	45	56	47	46	41	55	47	41	41	48	43	45	56	41	46	4.9											
2:15	50	44	54	47	45	40	55	47	41	42	48	43	45	55	40	46	4.9											
2:30	50	44	53	47	46	40	55	48	42	42	48	43	44	55	40	46	4.4											
2:45	50	44	53	47	46	40	54	48	42	42	48	43	44	54	40	46	4.4											
3:00	48	44	53	46	45	39	56	48	42	43	48	42	44	56	39	46	4.7											
3:15	48	44	53	45	46	39	50	56	49	42	43	47	42	44	56	39	46	4.7										
3:30	49	45	53	45	45	38													55	42	43	47	42	45	56	38	46	4.8
3:45	50	46	53	45	45	39													55	42	43	47	42	45	55	39	45	4.7
4:00	49	47	54	46	44	39													54	50	42	43	48	42	45	54	39	46
4:15	49	47	48	46	46	40	55	48	42	42	47	42	45	55	40	46	3.9											
4:30	53	47	47	47	46	39	51	51	55	48	42	47	42	45	55	39	46	4.3										
4:45	52	47	47	47	46	40													51	55	48	43	42	47	42	46	55	40
5:00	51	46	48	47	45	40	51	56	47	43	43	47	43	46	56	40	46	4.0										
5:15	54	46	50	47	45	41													56	47	43	43	47	43	48	56	41	46
5:30	53	47	54	47	45	40	53	56	48	44	43	47	43	56	40	47	4.9											
5:45	54	48	53	48	45	41												56	48	45	43	47	44	56	41	47	4.4	
6:00	51	48	52	48	46	41	56	48	45	44	47	44	56	41	47	4.2												
6:15	52	48	51	49	47	41	56	49	44	43	47	44	56	41	47	4.0												
6:30	52	50	53	49	46	42	56		45	43	48	46	56	42	48	4.4												
6:45	50	49	53	49	46	42	56	49	45	43	49	48	56	42	48	4.0												
7:00	51	49	49	49	46	42	56	48	46	43	48	48	56	42	47	3.6												
Max	54	50	56	49	47	43	56	56	50	46	44	49	48	48	56	43	50	4.3										
Min	45	43	45	45	42	38	50	53	47	41	41	41	42	44	53	38	44	3.8										
Ave	49	45	50	47	45	41	52	55	48	43	42	46	43	45	55	41	47	4.0										
SD	2.1	1.7	3.0	1.0	1.3	1.3	2.3	0.9	0.9	1.3	0.6	2.3	1.4	0.9	3.0	0.6	1.5	0.7										
90%	47	44	46	46	42	39	50	54	47	41	42	42	42	44	54	39	45	3.9										
																Median	44											

Two Day Results of Ambient Noise Monitoring



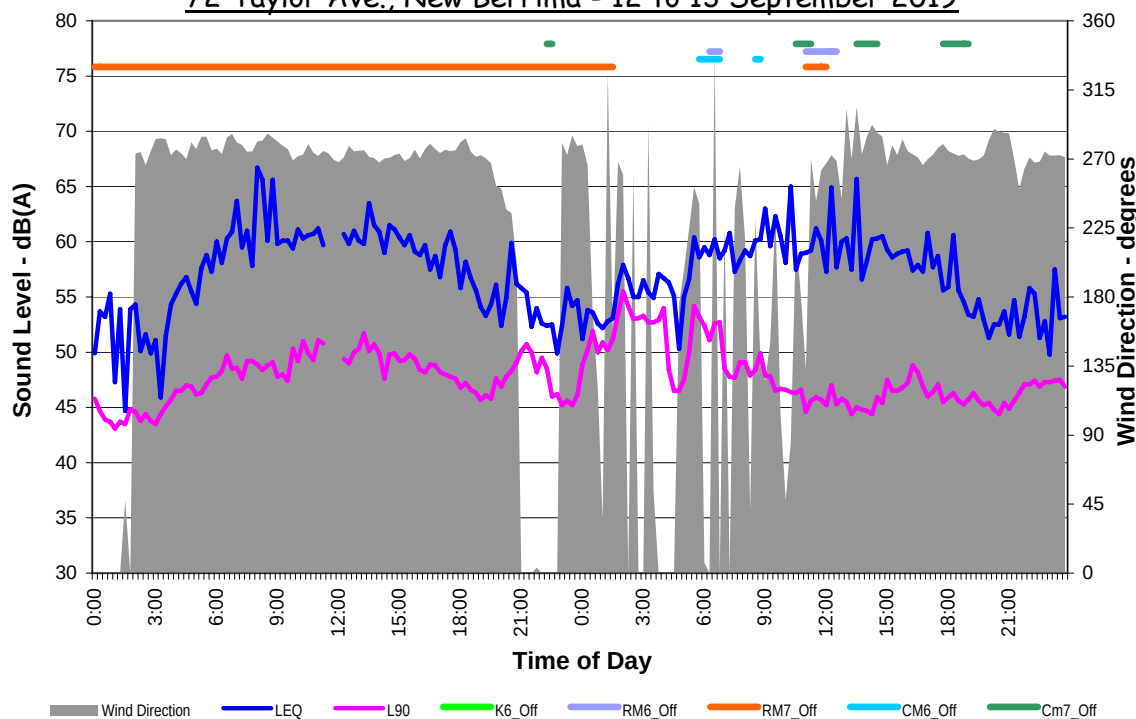
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 12 to 13 September 2019



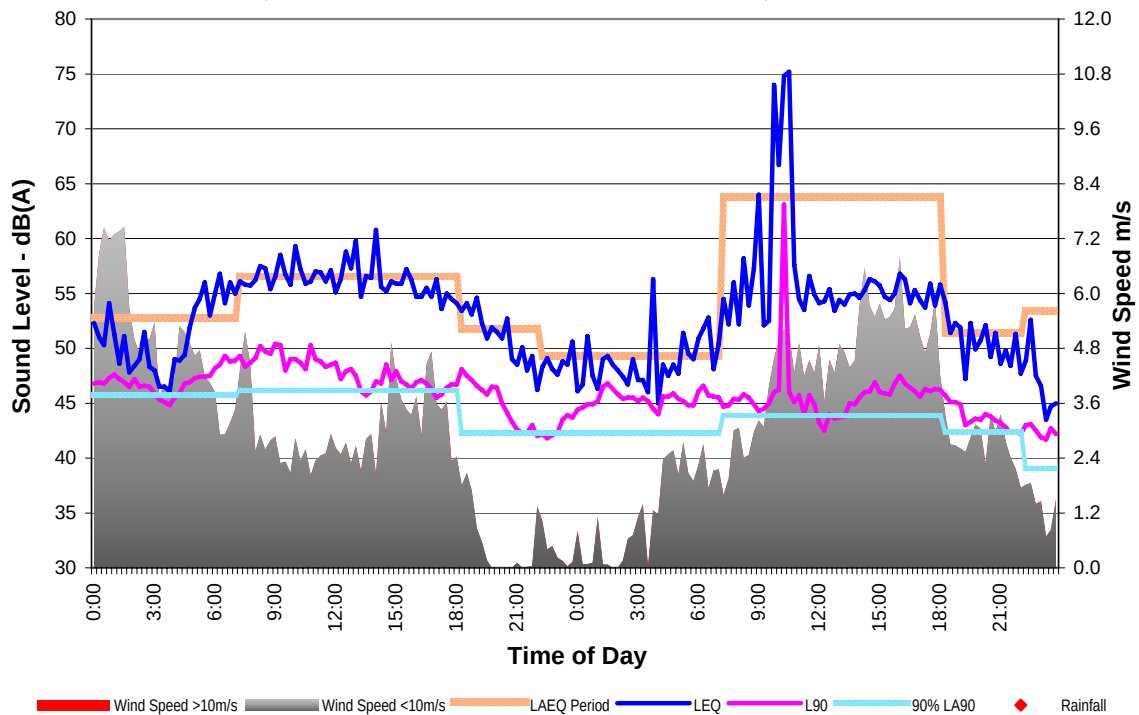
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 12 to 13 September 2019



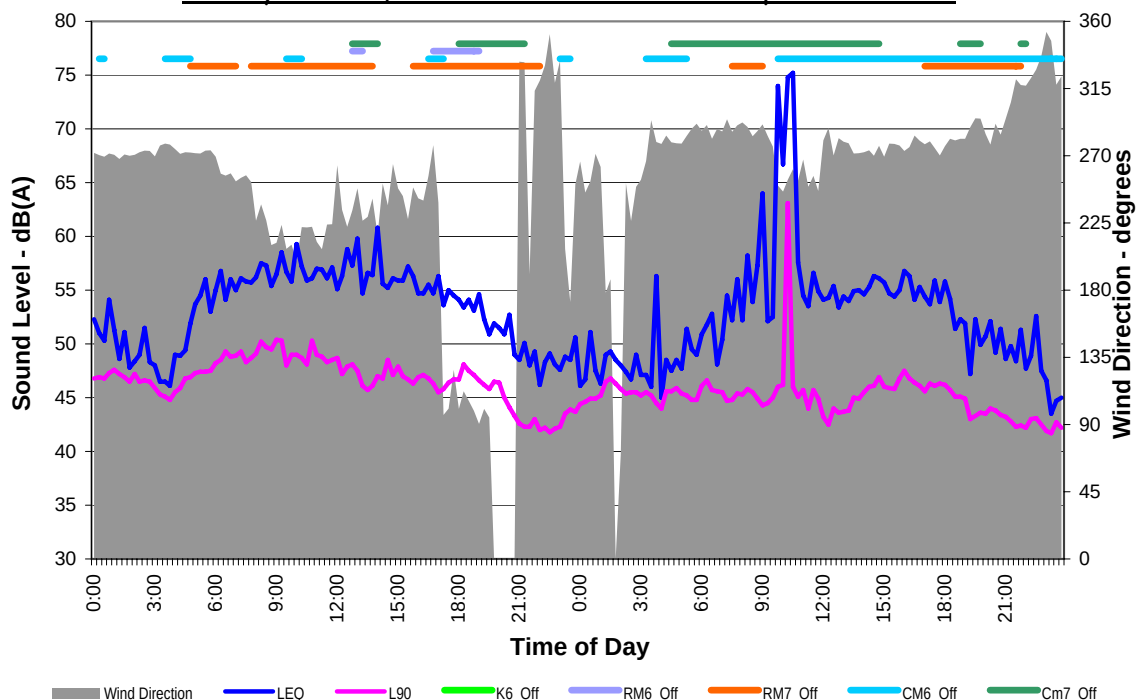
Berrima Cement Works - Ambient - Background Noise Survey

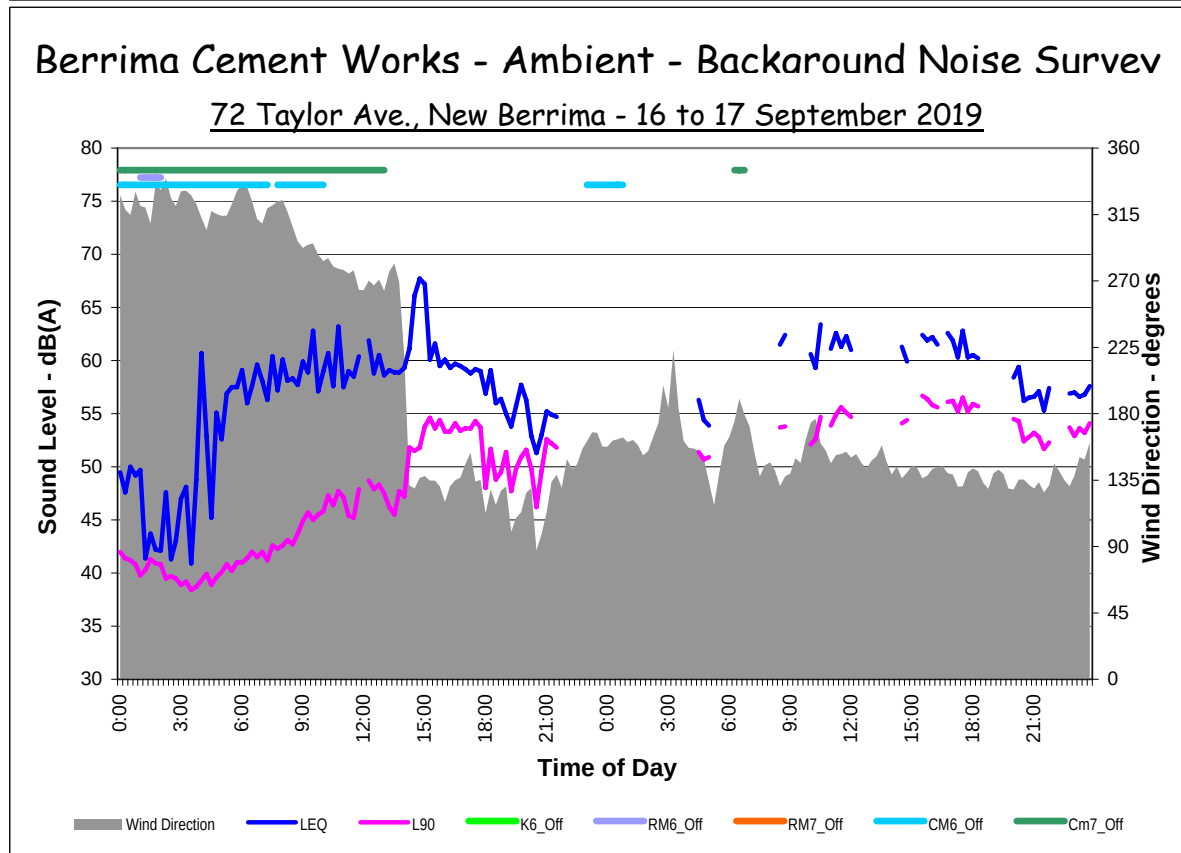
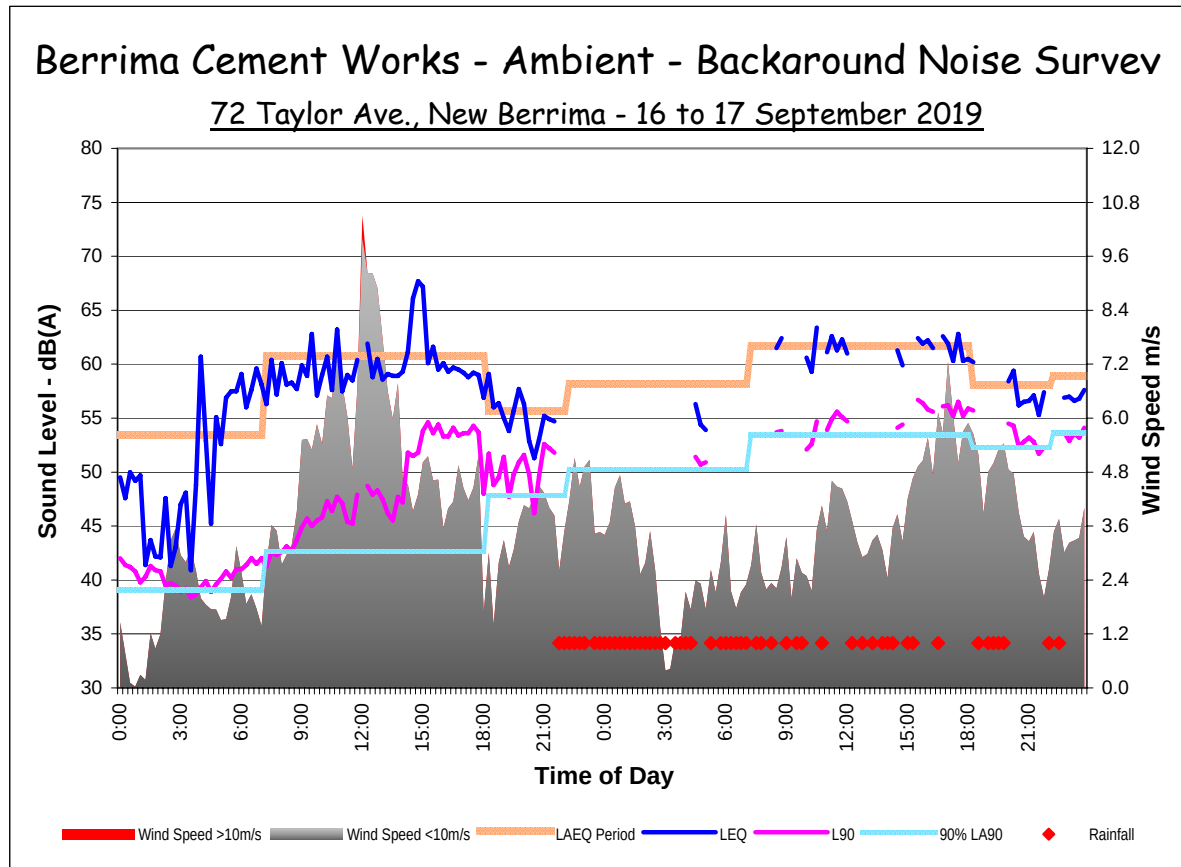
72 Taylor Ave., New Berrima - 14 to 15 September 2019



Berrima Cement Works - Ambient - Background Noise Survey

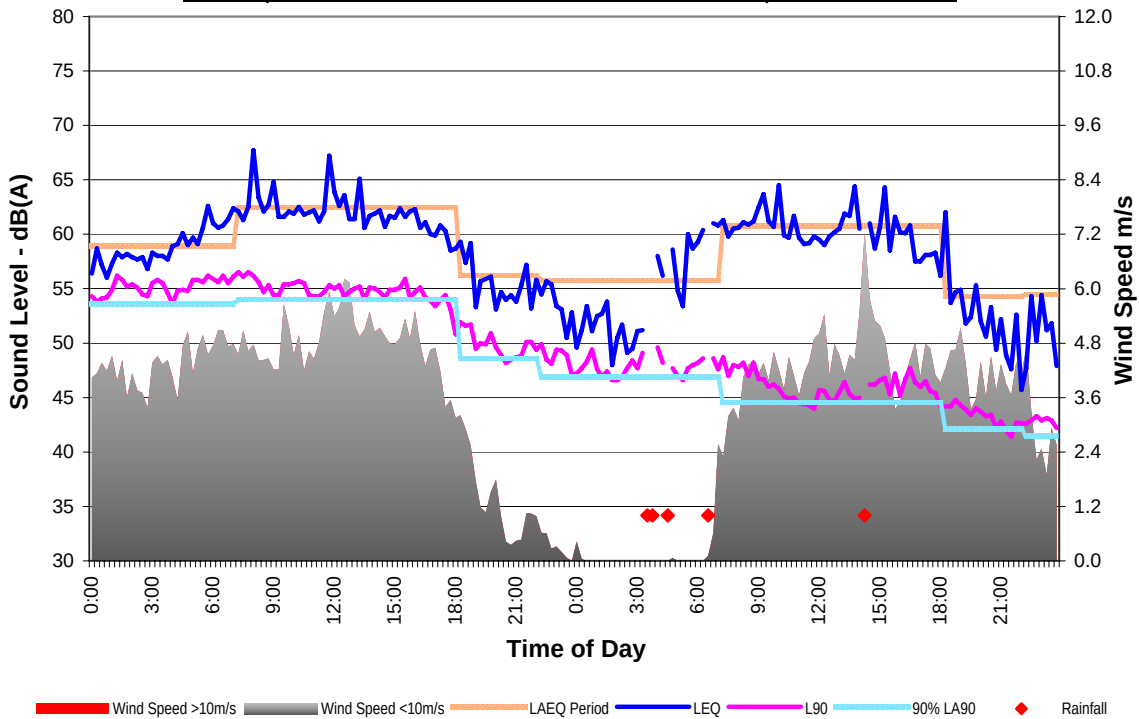
72 Taylor Ave., New Berrima - 14 to 15 September 2019





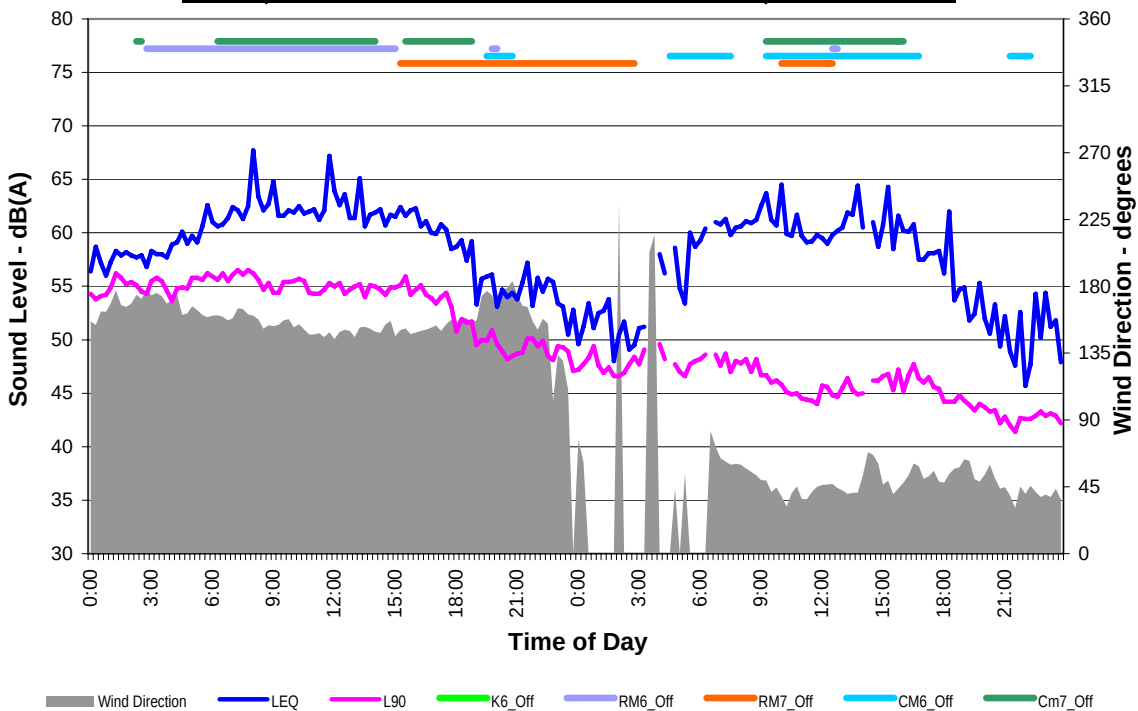
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 18 to 19 September 2019



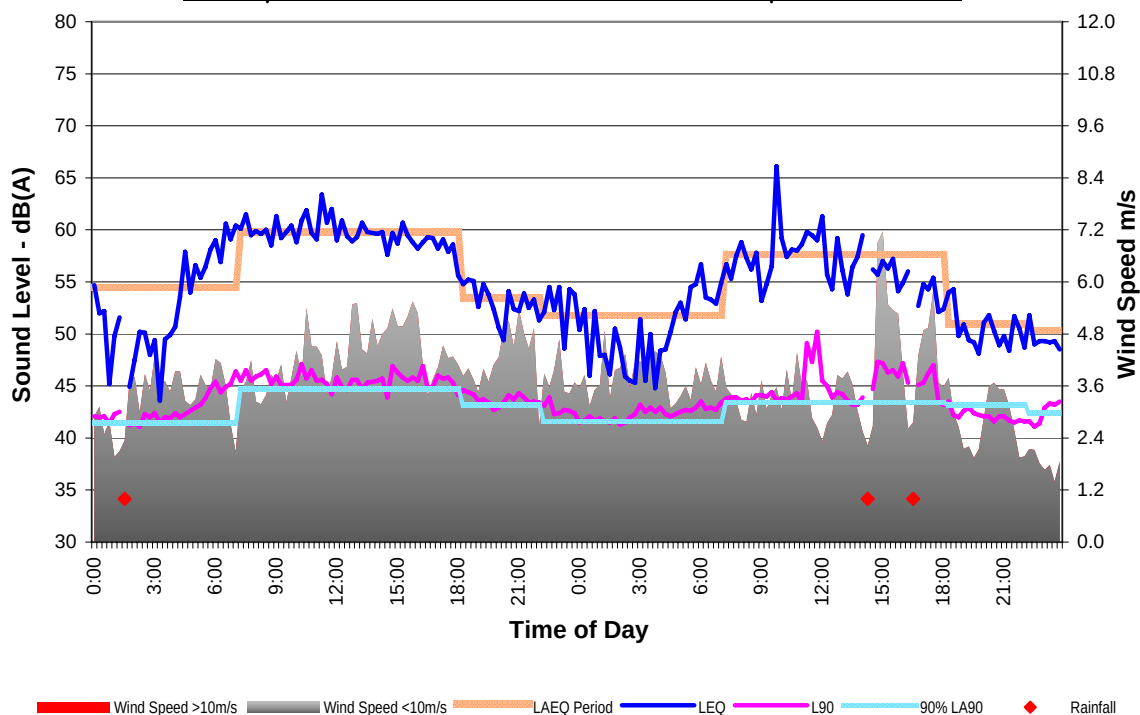
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 18 to 19 September 2019



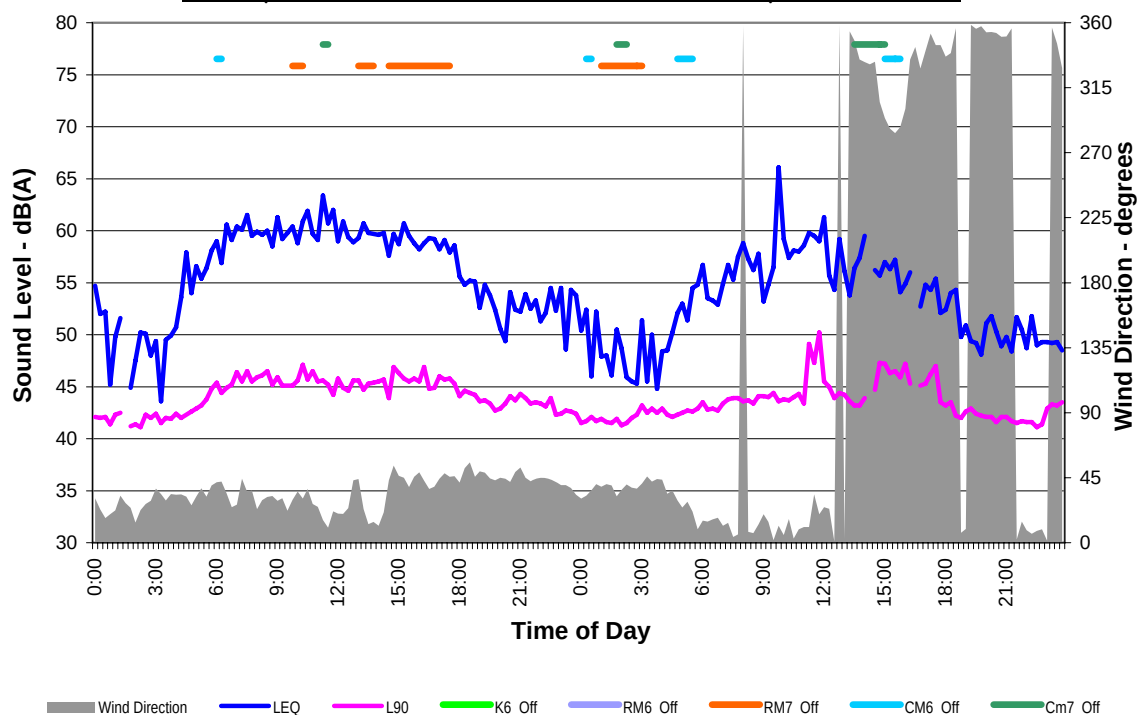
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 20 to 21 September 2019



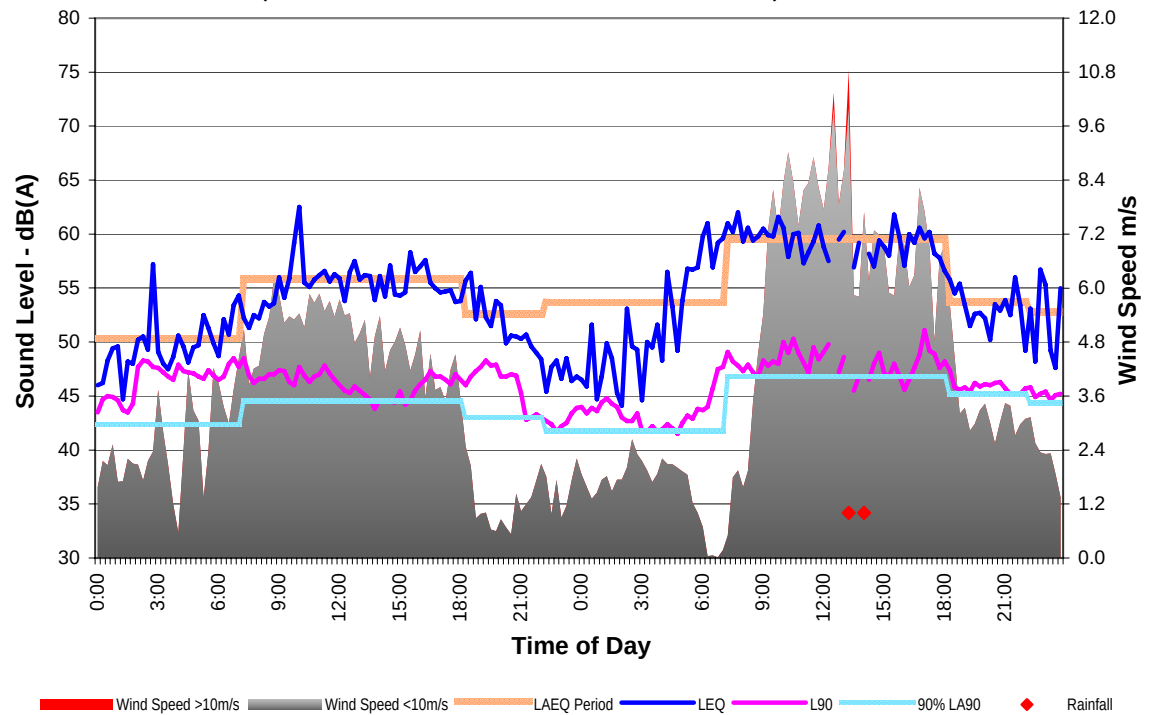
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 20 to 21 September 2019



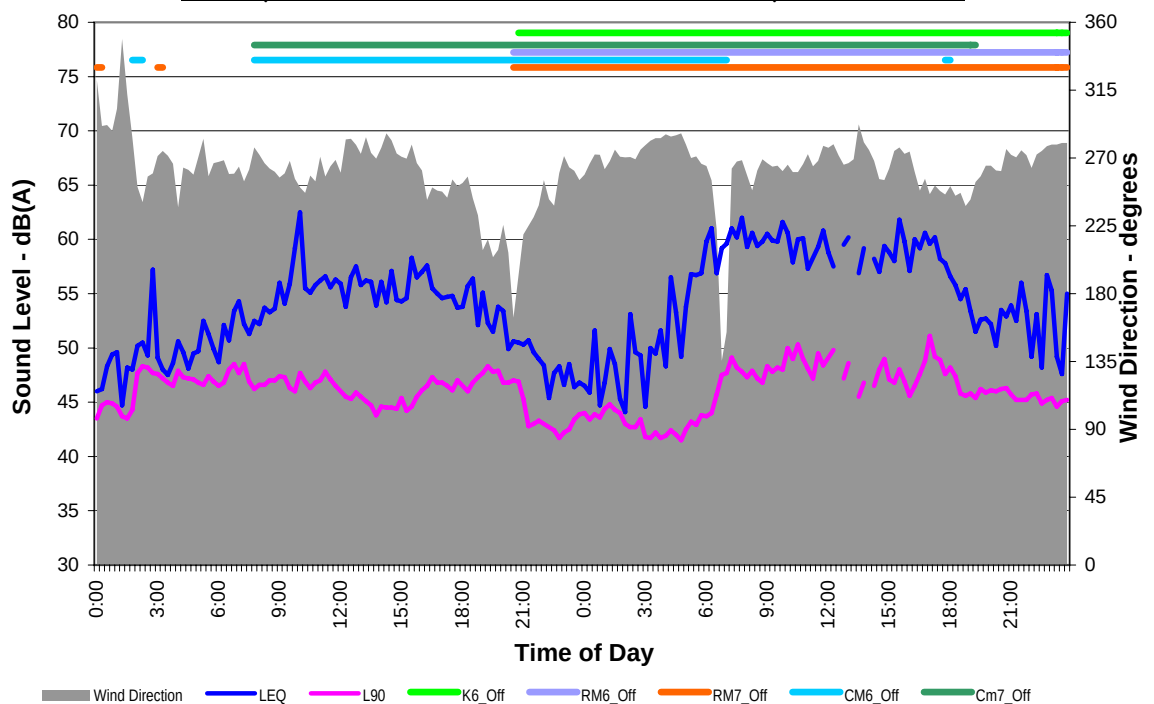
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 22 to 23 September 2019



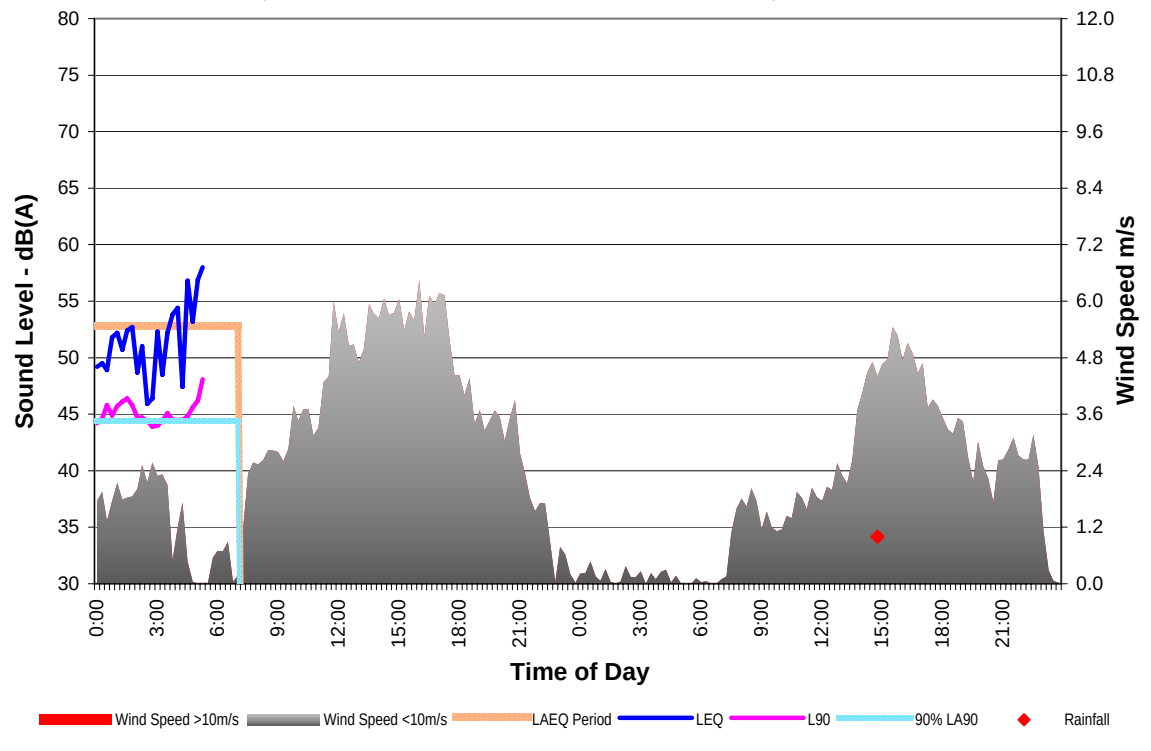
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 22 to 23 September 2019



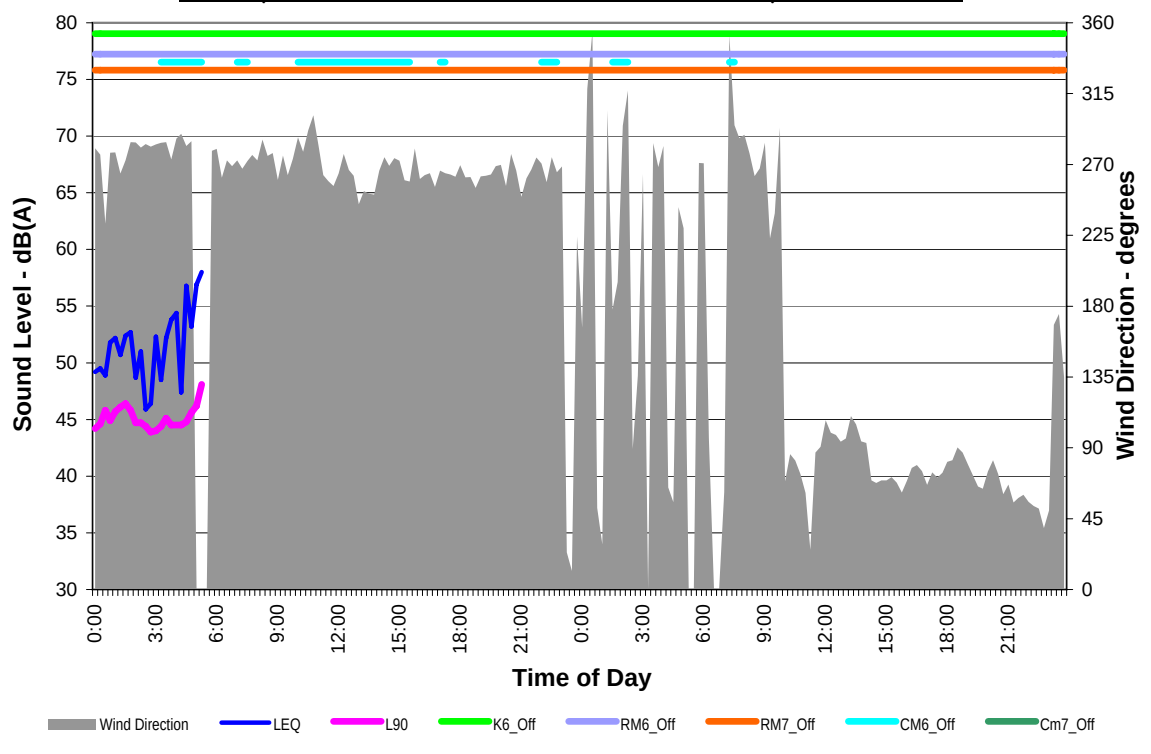
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 24 to 25 September 2019



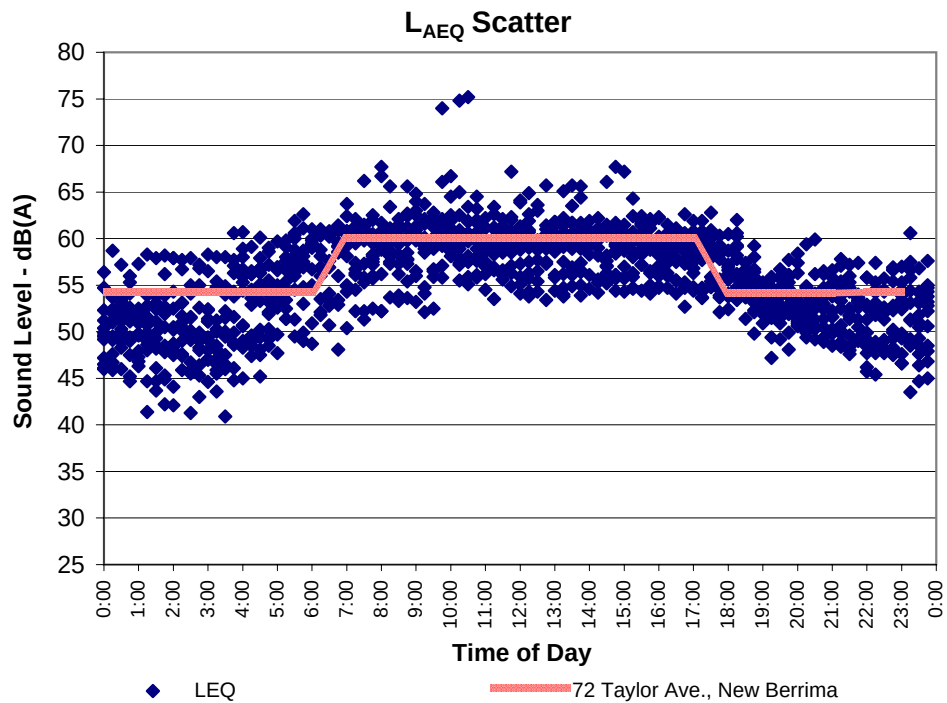
Berrima Cement Works - Ambient - Background Noise Survey

72 Taylor Ave., New Berrima - 24 to 25 September 2019



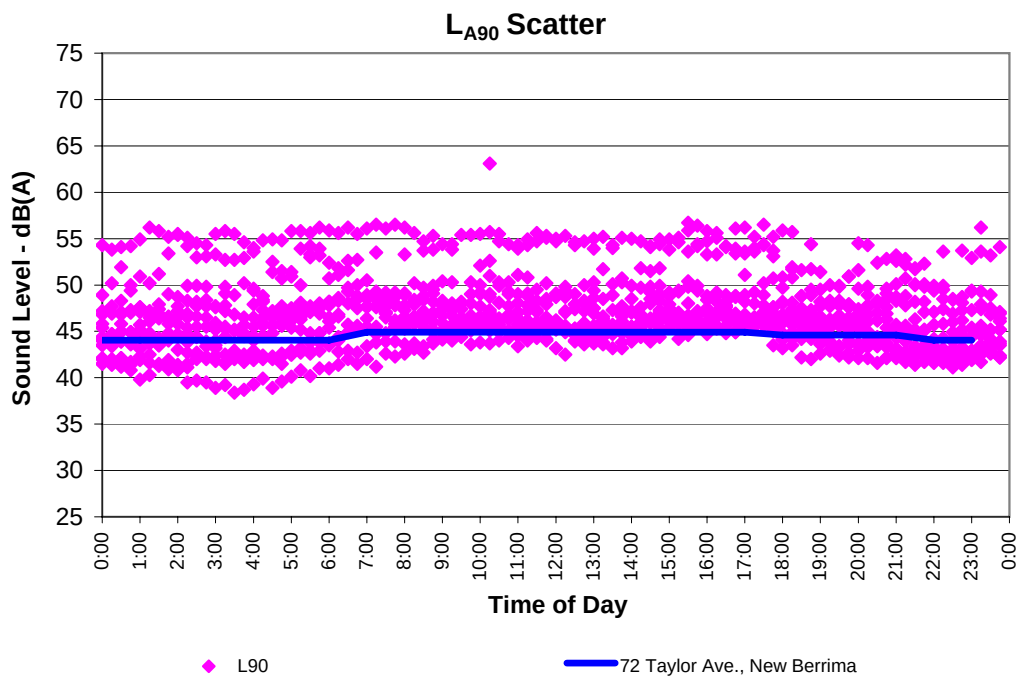
Berrima Cement Works - Ambient - Background Noise

72 Taylor Ave., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

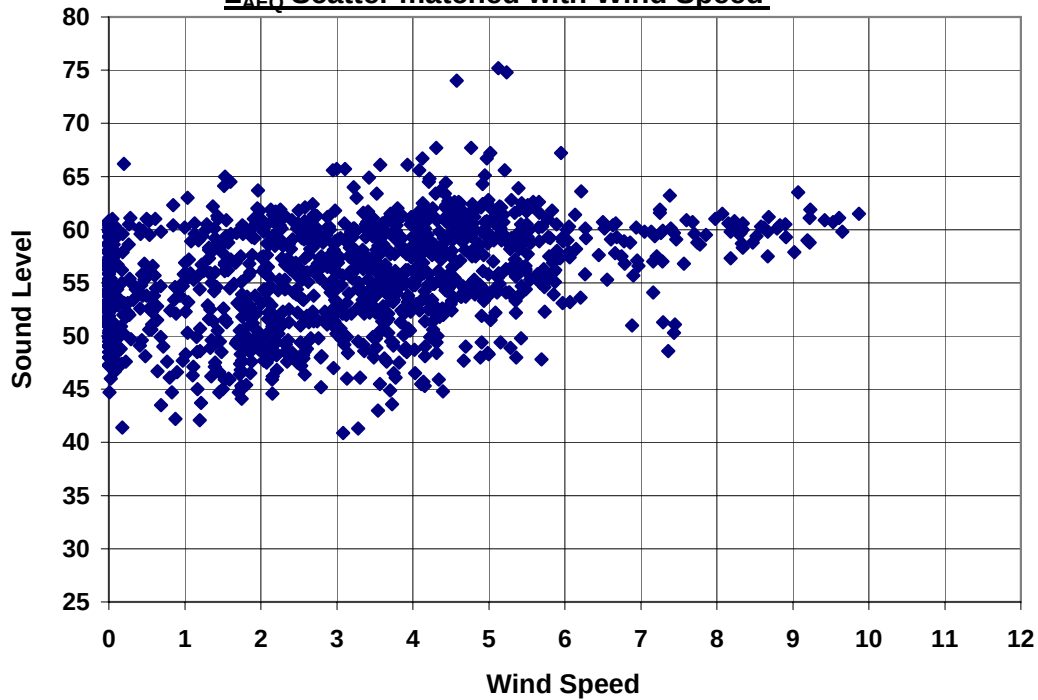
72 Taylor Ave., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

72 Taylor Ave., New Berrima - 10 September to 2 October 2019

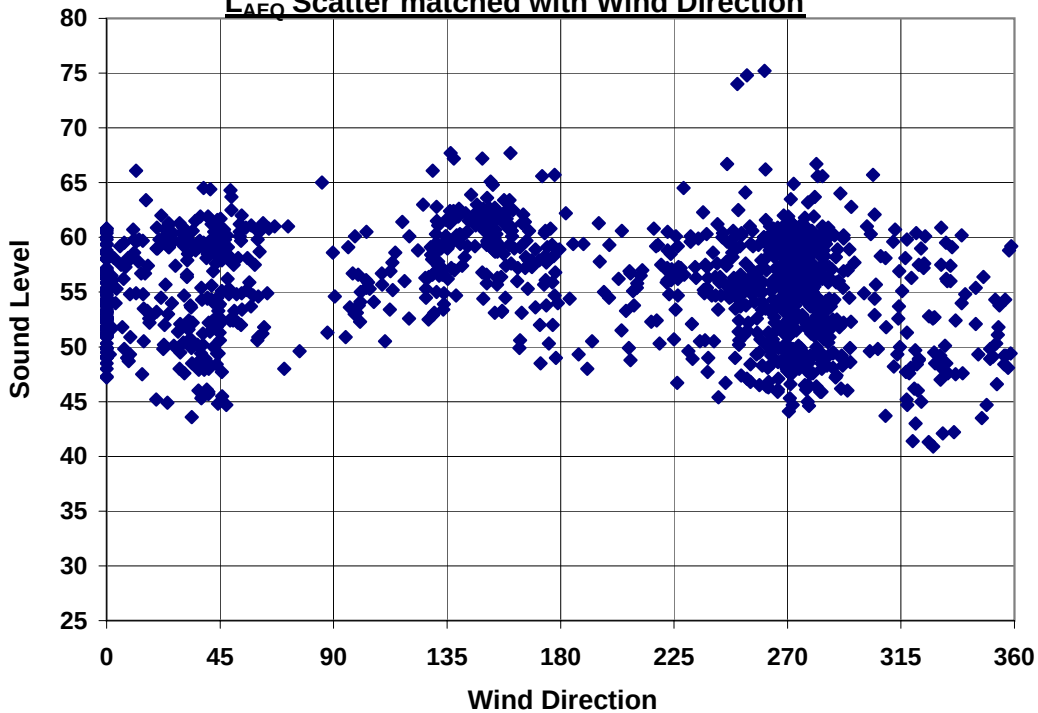
L_{AEQ} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

72 Taylor Ave., New Berrima - 10 September to 2 October 2019

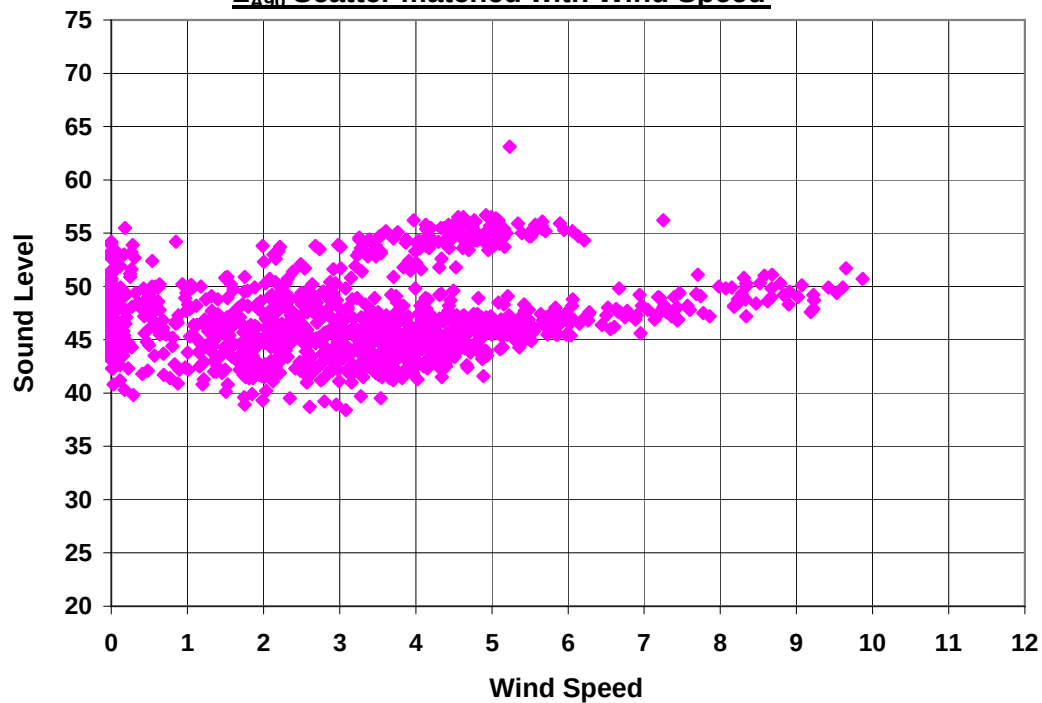
L_{AEQ} Scatter matched with Wind Direction



Berrima Cement Works - Ambient - Background Noise

72 Taylor Ave., New Berrima - 10 September to 2 October 2019

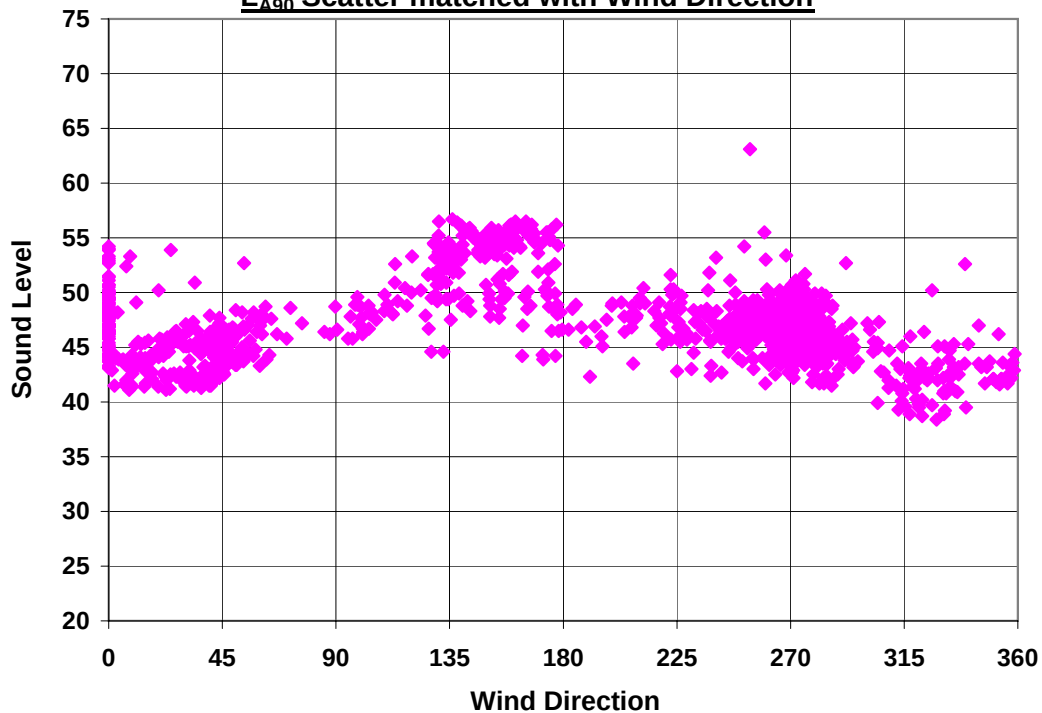
L_{A90} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

72 Taylor Ave., New Berrima - 10 September to 2 October 2019

L_{A90} Scatter matched with Wind Direction



Appendix D: Unattended environmental sound level results for 12 Brisbane Street

12 Brisbane St., New Berrima
Daytime LAEQ 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
7:00		55	54	59	54	50	48		57	52	53	53	53	51	59	48	53	3.0
7:15		57	55	57	54	50	47	57	57	54	52	51	50	52	57	47	53	3.2
7:30		56	54	57	55	49	47		57	53	55	52	53	54	57	47	53	3.0
7:45		54	53	57	54	48	52		57	53	53	49	57	50	57	48	53	3.1
8:00		54	53	52	51	52	47	56	57	53	50	48	62	50	62	47	52	4.0
8:15		51	51	55	52	46	49		57	52	50	48	55	52	57	46	51	3.0
8:30		55	52	51	49	46	50	57	57	51	51	49	51	49	57	46	51	3.3
8:45		51	52	50	51	47	48	57	58	53	49	49	47	49	58	47	51	3.4
9:00		51	54	50	51	46	48		59	52	50	48	48	52	59	46	51	3.5
9:15		50	52	50	51	49	54	57	57	53	51	48	50	50	57	48	51	2.8
9:30		51	51	52	50	50	51		57	54	52	53	50	55	57	50	52	2.2
9:45		49	52	51	59	46	47		57	53	51	51	48	51	59	46	51	3.8
10:00		50	50	53	52	52	54	56	57	52	54	56	47	52	57	47	52	2.7
10:15		50	50	50	51	47	47	56	57	52	53	49	49	55	57	47	51	3.3
10:30		48	49	54	51	46	50	56	58	50	52	51	49	53	58	46	51	3.4
10:45		48	50	55	52	46	46		57	53	52	51	47	52	57	46	51	3.4
11:00		48	54	57	51	47	48	56	57	52	54	50	51	51	57	47	52	3.2
11:15	53	48	54	63	50	48	47	56	59	56	58	52	50	52	63	47	53	4.6
11:30	52	49		56	51	47	50	57	57	49	56	52	52	59	59	47	53	3.7
11:45	53	66		58	52	49	49	55	55	51	55	54	48	52	66	48	54	4.6
12:00	55	49		57	50	48		56	55	48	56	51	50	52	57	48	52	3.4
12:15	54	48	53	48	50	46	47		56	51	51	49	52	50	56	46	50	2.8
12:30	53	52	54	51	50	48	51	57	59	50	51	51	53		59	48	52	3.0
12:45	54	51	54	47	51	46	49		59	52	55	48	53	51	59	46	51	3.5
13:00	53	51	53	48	50	46	53	57	59	54	55	50	50	52	59	46	52	3.5
13:15	53	51	51	52	50	45	52		59	54	53	48	48		59	45	51	3.6
13:30	52	54	53	50	51	49	51	56	59	54	51	48	50		59	48	52	3.1
13:45	53	56	52	52	49	46	53		59	55	55	47	54		59	46	52	3.7
14:00	52	49	52	49	50	45	47		56	52	54	49	52		56	45	50	3.1
14:15	70	53	53	54	46	46	48		57		55		47		70	46	53	7.2
14:30	51	57	54	51	48	47	48	56	54	51	56	47	50		57	47	51	3.6
14:45	56	54	53	48	48	48	50	57	59	50	61	48	47		61	47	52	4.7
15:00	54	56	54	46	49	45	52		59	53	55	56	46		59	45	52	4.6
15:15	53	54	49	49	48	48	58		56	56	52	67	46		67	46	53	5.9
15:30	52	58	55	49	49	55	57	56	55	53	52	51	48		58	48	53	3.3
15:45	54	55	53	49	50	52	57	56	56	54	57	56	47		57	47	53	3.2
16:00	51	58	56	49	50	51	60	57	58	55	56	54	50		60	49	54	3.6
16:15	52	58	51	53	54	50	64	58	58	55	53	48	48		64	48	54	4.7
16:30	54	53	51	50	50	48	60		57	51	51		47		60	47	52	3.8
16:45	54	50	50	51	50	51	65	59	59	50	52	50	51		65	50	53	4.9
17:00	53	49	50	53	50	54	60	59	58	53	52	50	53		60	49	53	3.6
17:15	55	50	51	50	55	51	58	56	57	56	51	50	50		58	50	53	3.0
17:30	51	50	50	65	53	51	57	57	60	51	50	51	51		65	50	53	4.8
17:45	51	48	50	51	48	67	58	59	61	50	52	51	53		67	48	54	5.8
18:00	54	47	52	54	48	47	58	60	60	57	51	50	51		60	47	53	4.5
Max	70	66	56	65	59	67	65	60	61	57	61	67	62	59	70	56	62	4.2
Min	51	47	49	46	46	45	46	55	54	48	49	47	47	49	55	45	48	3.2
Ave	53	52	52	52	51	48	52	57	57	52	53	51	50	52	57	48	52	2.3
SD	3.4	3.8	1.8	4.0	2.4	3.7	5.1	1.1	1.5	2.0	2.5	3.5	3.2	2.2	5.1	1.1	2.9	1.1
E Ave	57	54	52	55	51	53	55	57	58	53	54	54	52	52	58	51	54	2.0

Evening LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
18:00	54	47	52	54	48	47	58	60	60	57	51	50	51		60	47	53	4.5
18:15	53	49	50	54	51	47	59	59	57	52	55	52	50		59	47	53	3.7
18:30	59	56	52	49	55	51	58		55	53	50	53	48		59	48	53	3.4
18:45	57	51	53	48	51	48	59	58	55	51	51	50	50		59	48	52	3.8
19:00	54	50	48	53	51	47	53		53	49	50	45	49		54	45	50	2.6
19:15	53	50	48	49	50	47	54		53	51	51	47	49		54	47	50	2.3
19:30	53	47	47	47	51	46	51		52	51	49	46	47		53	46	49	2.5
19:45	52	47	47	45	50	44	54		53	52	48	44	48		54	44	48	3.5
20:00	54	46	46	46	48	46	53	58	51	50	48	43	48		58	43	49	4.0
20:15	52	49	47	46	47	43	51	58	52	47	50	46	49		58	43	49	3.7
20:30	52	47	48	45	47	43	52	58	52	48	53	45	49		58	43	49	4.1
20:45	51	49	49	45	49	43	55	58	52	48	50	43	49		58	43	49	4.4
21:00	51	47	48	45	49	42	54	57	50	47	49	43	48		57	42	48	4.1
21:15	51	47	50	45	46	44	52	55	51	52	50	41	47		55	41	48	3.9
21:30	50	45	50	44	47	42	52		54	50	47	54	48		54	42	48	4.0
21:45	52	46	50	45	45	43		55	50	45	54	46	48		55	43	48	4.0
22:00	51	47	51	44	44	43			51	49	52	43	46		52	43	47	3.6
Max	59	56	53	54	55	51	59	60	60	57	55	53	51		60	51	55	3.2
Min	50	45	46	44	44	42	51	54	50	45	48	41	46		54	41	46	3.8
Ave	53	48	49	47	48	45	54	57	52	50	51	46	48		57	45	50	3.5
SD	2.3	2.7	2.1	3.4	2.8	2.5	2.9	1.8	2.7	2.9	2.2	3.6	1.2		3.6	1.2	2.5	0.6
E Avg	53	49	49	49	49	46	55	57	53	51	51	47	48		57	46	51	3.3

Night LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD	
22:00	51	47	51	44	44	43	58		51	49	52	43	46		52	43	47	3.6	
22:15	49	51	52	48	45	42			54	50	47	53	41	44		54	41	48	4.2
22:30	51	46	51	47	43	41				51	44	54	45	45		54	41	47	4.1
22:45	52	46	51	47	45	42			54	51	50	47	43	46		54	42	48	3.6
23:00	53	44	51	48	44	42			54	53	50	48	41	44		54	41	47	4.5
23:15	51	55	50	48	42	42			56	52	52	48	42	43		58	42	49	5.6
23:30	51	45	47	46	46	43			53	50	46	46	41	42		53	41	46	3.6
23:45	51	45	46	47	42	42			54	50	45	44	44	43		54	42	46	3.8
0:00	54	46	45	46	44	41		54	51	48	52	43	43		54	41	47	4.4	
0:15	51	48	47	48	43	46		54	51	47	50	43	43		54	43	47	3.6	
0:30	50	47	47	47	43	41		53	51	45	46	41	44		53	41	46	3.9	
0:45	49	46	49	46	44	41		54	49	44	49	43	44		54	41	46	3.7	
1:00	46	47	50	46	46	41		54	48	46	48	42	45		54	41	46	3.4	
1:15	47	48	52	46	46	42		54	50	44	45	43	43		54	42	46	3.7	
1:30	49	46	52	47	46	41		54	51		44	44	44		54	41	47	4.0	
1:45	48	47	52	47	45	41		54	50	43	51	44	44		54	41	47	3.9	
2:00	48	44	50	47	45	41		55	49	44	48	43	45		55	41	46	3.8	
2:15	49	47	51	46	49	39		57	48	44	44	42	46		57	39	47	4.6	
2:30	50	44	51	46	47	40		55	47	45	46	41	44		55	40	46	4.2	
2:45	51	47	53	46	47	40		55	47	43	45	44	45		55	40	47	4.3	
3:00	52	46	54	47	46	39		56	47	43	49	47	43		56	39	47	4.8	
3:15	53	45	55	46	45	39	56	56	48	44	48	48	44		56	39	48	5.2	
3:30	54	45	51	46	46	38			55		46	44	47	43		55	38	47	4.8
3:45	54	44	51	46	45	38			54		44	48	48	44		54	38	47	4.8
4:00	50	45	52	46	45	39		55	48	46	48	46	42		55	39	47	4.4	
4:15	48	45	52	45	45	39		55	50	46	45	45	43		55	39	46	4.3	
4:30	48	46	53	45	45	37	56	56		49	47	45	43		56	37	47	5.4	
4:45	51	47	54	44	48	40		58	54	50	44	47	45	42		58	40	48	5.1
5:00	50	48	56	45	44	45	57	55	52	50	44	47	42		57	42	49	5.0	
5:15	51	48	54	46	46	41		55	50	45	46	46	45		55	41	48	4.0	
5:30	53	49	48	46	45	39	54	56	52	48	47	47	44		56	39	48	4.6	
5:45	53	48	48	47	45	43			55	51	48	50	46	43		55	43	48	3.7
6:00	52	47	50	48	45	42			56	48	46	47	47	44		56	42	47	3.7
6:15	55	50	55	48	45	44		56	48	47	47	46	47		56	44	49	4.0	
6:30	54	49	55	48	48	45		56		50	50	53	51		56	45	51	3.5	
6:45	57	55	59	53	49	53		58	55	52	50	52	49		59	49	53	3.2	
7:00	55	54	59	54	50	48		57	52	53	53	53	51		59	48	53	3.0	
Max	57	55	59	54	50	53	58	58	55	53	54	53	51		59	50	54	2.8	
Min	46	44	45	44	42	37	54	53	47	43	44	41	42		54	37	44	4.9	
Ave	51	47	51	47	45	41	56	55	50	46	48	45	44		56	41	48	4.4	
SD	2.4	2.7	3.2	2.0	1.8	3.0	1.4	1.1	1.8	2.8	2.7	3.1	2.2		3.2	1.1	2.3	0.7	
E Avg	52	48	52	47	45	43	56	55	50	47	48	46	45		56	43	49	4.1	
24hr	55	53	51	53	50	50	54	56	56	51	52	51	50	50	56	50	52	2.3	

12 Brisbane St., New Berrima
Daytime LA90 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
7:00		52	47	56	48	46	39		54	48	44	42	45	43	56	39	47	4.9
7:15		51	48	56	49	46	39	53	53	48	44	42	45	43	56	39	47	5.0
7:30		53	48	55	49	45	40		53	48	44	42	46	44	55	40	47	4.9
7:45		51	48	54	48	44	39		54	47	44	42	48	44	54	39	47	4.5
8:00		50	47	48	48	44	39	54	54	46	45	41	46	46	54	39	47	4.2
8:15		49	46	47	48	43	39		54	46	43	42	46	45	54	39	46	3.9
8:30		46	47	48	47	42	39	54	54	46	44	41	44	45	54	39	46	4.3
8:45		46	47	48	47	42	40	54	54	47	43	42	43	44	54	40	46	4.3
9:00		45	46	47	47	42	39		54	46	44	42	44	44	54	39	45	3.6
9:15		44	46	46	48	43	40	53	53	46	44	41	44	44	53	40	45	4.0
9:30		43	45	46	47	43	41		52	46	44	42	44	43	52	41	45	3.0
9:45		42	46	47	47	42	40		53	46	43	43	44	43	53	40	44	3.3
10:00		42	45	47	48	42	41	53	52	45	44	47	44	45	53	41	46	3.6
10:15		42	46	45	48	41	41	53	52	45	44	43	44	45	53	41	45	3.8
10:30		41	45	44	47	42	41	53	53	44	43	42	43	45	53	41	45	4.0
10:45		43	46	45	47	43	42		53	44	42	42	43	45	53	42	44	3.1
11:00	50	43	46	44	47	43	42	52	53	43	43	42	45	45	53	42	45	3.7
11:15	50	43	48	43	48	43	43	53	54	43	44	42	44	45	54	42	45	3.9
11:30	49	43		46	47	42	44	54	53	43	45	41	44	48	54	41	46	4.1
11:45	50	43		44	46	44	44	53	51	44	43	41	43	46	53	41	45	3.5
12:00	51	43		42	46	44		53	52	42	44	42	44	45	53	42	45	3.7
12:15	50	44	49	42	47	42	42		52	42	42	43	45	44	52	42	44	3.1
12:30	50	45	49	44	46	43	42	54	53	42	43	43	45		54	42	46	4.0
12:45	50	44	49	43	48	42	44		53	42	42	43	45	46	53	42	45	3.4
13:00	50	44	48	42	46	40	46	54	52	44	42	43	44	46	54	40	45	4.0
13:15	49	44	47	42	46	39	46		52	44	43	42	43		52	39	44	3.4
13:30	48	53	49	43	46	40	44	53	52	43	42	42	42		53	40	46	4.7
13:45	48	47	47	44	46	40	46		52	43	43	43	43		52	40	45	3.2
14:00	48	44	48	42	44	40	44		52	43	42	41	42		52	40	44	3.3
14:15	47	44	49	41	44	41	42		52		42		42		52	41	44	4.0
14:30	48	53	49	41	44	41	43	53	51	44	43	40	43		53	40	45	4.9
14:45	50	44	48	41	44	40	45	53	52	42	43	41	42		53	40	44	4.2
15:00	49	45	48	41	45	41	44		52	43	43	41	42		52	41	44	3.4
15:15	49	44	45	41	45	43	49		52	46	42	45	42		52	41	45	3.3
15:30	48	45	49	43	45	51	50	53	52	44	41	43	42		53	41	46	4.1
15:45	47	48	48	42	43	43	51	53	53	44	46	45	43		53	42	46	3.9
16:00	47	52	47	44	46	44	52	53	52	43	44	46	44		53	43	47	4.0
16:15	48	46	46	44	46	43	53	54	53	43	43	43	44		54	43	46	4.2
16:30	48	43	47	44	45	43	52		53	41	43		42		53	41	45	4.1
16:45	48	43	46	43	45	45	52	54	52	42	44	43	44		54	42	46	4.3
17:00	47	43	45	44	46	47	51	53	52	43	44	45	44		53	43	46	3.6
17:15	48	42	45	45	46	44	52	53	52	44	43	43	44		53	42	46	3.8
17:30	46	43	45	45	46	43	52	54	52	44	42	42	45		54	42	46	4.2
17:45	47	42	46	45	43	43	52	54	52	44	44	42	45		54	42	46	4.3
18:00	49	42	46	44	43	43	52	54	52	45	44	43	45		54	42	46	4.2
Max	51	53	49	56	49	51	53	54	54	48	46	47	48	48	56	46	50	3.2
Min	46	41	45	41	43	39	39	52	51	41	41	40	42	43	52	39	43	4.1
Ave	48	45	47	45	46	43	44	53	52	44	43	42	44	44	53	42	46	3.4
SD	1.2	3.5	1.3	3.7	1.6	2.0	4.8	0.6	0.8	1.8	0.9	1.3	1.3	1.2	4.8	0.6	1.9	1.3
90%	47	42	45	41	44	40	39	53	52	42	42	41	42	43	53	39	44	4.0
																Median	42	

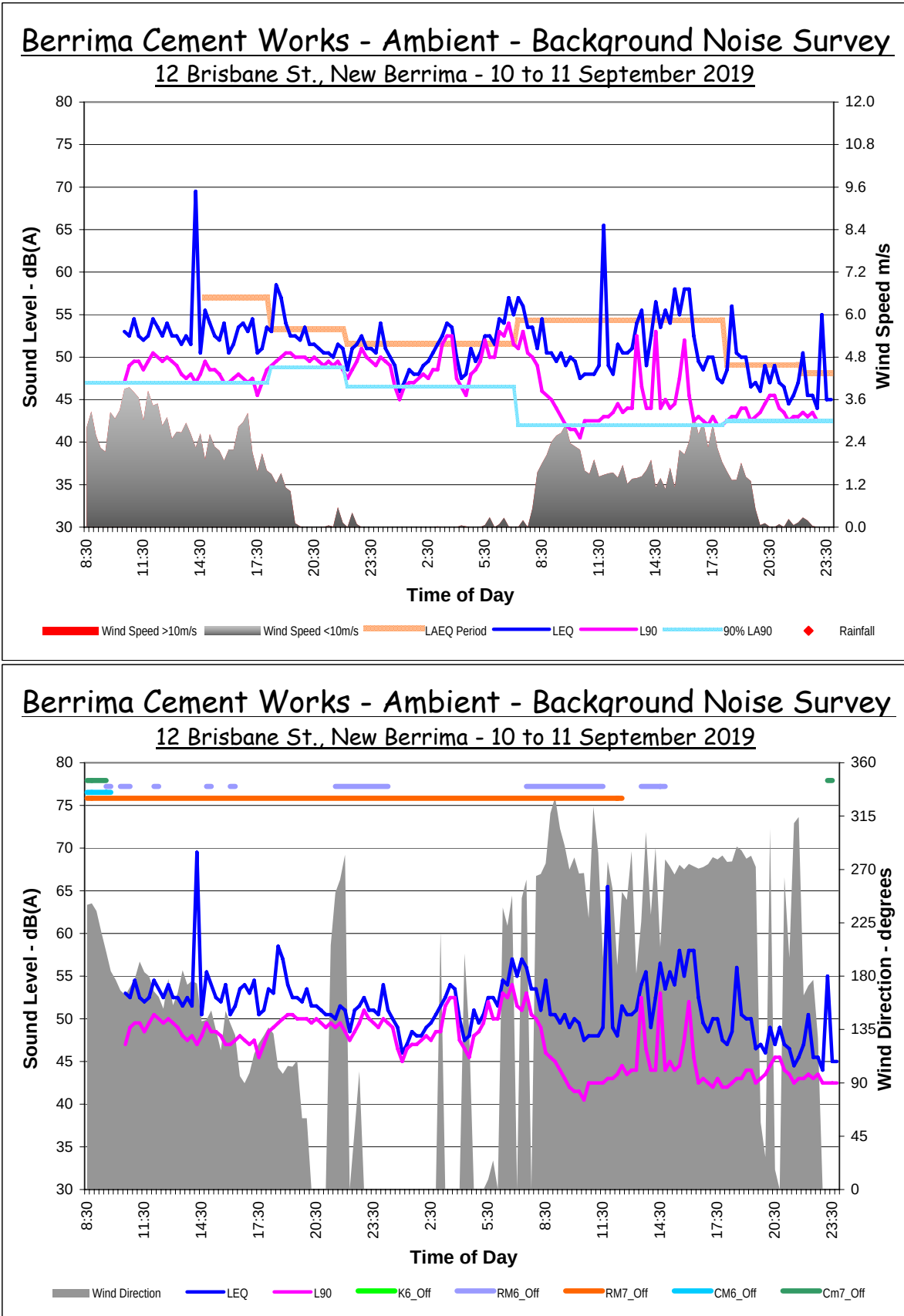
Evening LA90

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD
18:00	49	42	46	44	43	43	52	54	52	45	44	43	45		54	42	46	4.2
18:15	49	43	45	44	44	44	52	53	52	45	44	45	45		53	43	46	3.8
18:30	50	43	45	44	47	44	52		52	44	44	43	44		52	43	45	3.1
18:45	50	43	44	43	47	44	52	53	51	43	44	41	45		53	41	46	3.9
19:00	51	44	44	44	47	44	49		50	43	43	40	45		50	40	45	2.8
19:15	51	44	44	45	48	43	50		50	44	44	41	44		50	41	45	3.0
19:30	50	43	44	43	48	42	49		50	43	43	40	45		50	40	44	3.2
19:45	50	43	44	43	48	42	50		50	44	43	39	46		50	39	45	3.4
20:00	50	44	43	44	46	42	50	53	49	43	43	39	47		53	39	45	3.9
20:15	50	45	44	44	46	41	48	54	50	43	42	40	48		54	40	45	4.0
20:30	50	46	44	43	46	41	50	54	50	42	42	39	47		54	39	45	4.3
20:45	50	46	46	44	47	41	50	54	51	43	42	39	47		54	39	46	4.3
21:00	49	44	46	44	47	41	50	53	49	43	42	39	46		53	39	45	4.0
21:15	50	44	48	43	44	41	50	52	49	43	42	39	46		52	39	45	4.0
21:30	49	43	48	42	44	41	47		51	48	42	43	38	47	51	38	44	3.8
21:45	50	43	49	43	43	41		51	49	41	42	38	46		51	38	44	4.0
22:00	49	43	49	42	41	41			48	42	43	38	43		49	38	43	3.3
Max	51	46	49	45	48	44	52	54	52	45	44	45	48		54	44	48	3.5
Min	49	42	43	42	41	41	47	51	48	41	42	38	43		51	38	43	3.8
Ave	50	43	45	43	45	42	50	53	50	43	43	40	46		53	40	46	3.8
SD	0.6	1.0	1.9	0.8	2.1	1.3	1.6	1.0	1.3	1.1	0.8	1.9	1.3		2.1	0.6	1.3	0.5
90%	49	43	44	42	43	41	48	51	48	42	42	38	44		51	38	44	3.8
																Median	43	

Night LA90

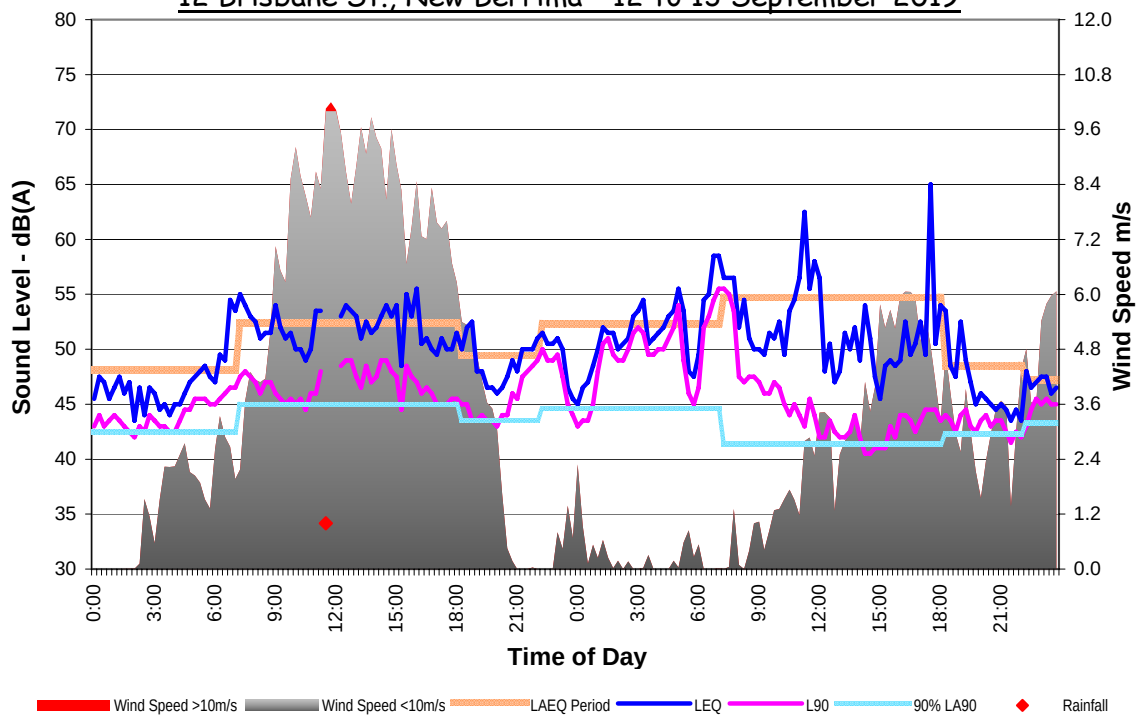
Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	Maximum	Minimum	Average	SD	
22:00	49	43	49	42	41	41	53	51	48	42	43	38	43		49	38	43	3.3	
22:15	48	44	50	43	41	40			49	41	42	38	43		51	38	44	4.3	
22:30	49	43	49	45	40	39			49	40	43	38	43		49	38	43	3.8	
22:45	50	44	49	46	41	39			51	50	42	42	38	42		51	38	44	4.4
23:00	51	43	50	45	39	40			52	50	42	42	38	42		52	38	44	4.8
23:15	50	43	48	46	40	40			52	50	41	41	38	41		53	38	44	5.1
23:30	50	43	45	45	39	41			52	49	42	42	38	41		52	38	43	4.1
23:45	49	43	44	45	40	40			52	48	42	41	39	41		52	39	43	3.9
0:00	50	43	43	45	40	40			52	50	42	41	38	41		52	38	43	4.3
0:15	50	44	44	45	41	40			52	49	42	41	40	42		52	40	43	3.8
0:30	49	43	44	45	42	40	52	49	42	41	40	43		52	40	43	3.8		
0:45	47	44	45	45	43	39	52	47	40	40	40	43		52	39	43	3.7		
1:00	45	44	48	45	44	39	52	47	41	40	40	43		52	39	44	3.9		
1:15	47	44	51	45	44	39	51	48	40	40	42	42		51	39	44	4.3		
1:30	47	43	51	45	44	38	52	49		40	42	43		52	38	45	4.6		
1:45	47	43	50	45	44	38	52	48	39	40	42	43		52	38	44	4.3		
2:00	48	42	49	45	44	37	52	47	40	40	42	44		52	37	44	4.4		
2:15	48	43	49	45	45	37	55	46	40	39	40	45		55	37	44	5.0		
2:30	48	43	50	45	46	39	53	47	40	40	40	43		53	39	44	4.5		
2:45	49	44	52	45	46	39	53	46	39	40	42	43		53	39	44	4.7		
3:00	49	44	52	46	45	38	54	46	40	40	46	42		54	38	44	5.0		
3:15	52	43	52	45	44	37	53	46	40	40	47	41		53	37	45	5.5		
3:30	53	43	50	45	44	36	53		41	40	46	42		53	36	44	4.8		
3:45	53	43	50	44	44	36	52		40	41	46	42		52	36	44	4.7		
4:00	48	43	50	44	44	36	54	47	41	41	45	41		54	36	44	4.9		
4:15	47	44	50	44	45	37	53	49	40	41	44	41		53	37	44	4.8		
4:30	46	45	51	43	44	36	53	53	41	41	44	41		53	36	44	5.6		
4:45	48	45	52	43	43	37	52	53	48	40	41	45	40		53	37	45	5.4	
5:00	49	46	54	44	43	37	53	52	49	41	41	46	40		54	37	45	5.6	
5:15	50	46	49	44	45	37	53	48	40	40	45	40		53	37	44	4.8		
5:30	52	46	46	45	44	36	51	53	47	41	41	45	40		53	36	44	4.8	
5:45	50	45	45	45	44	37		52	47	41	40	45	40		52	37	44	4.1	
6:00	50	45	47	46	44	38		53	46	41	40	45	41		53	38	44	4.0	
6:15	53	46	52	46	44	39		53	46	41	41	45	40		53	39	45	4.7	
6:30	53	46	53	46	44	38		54		42	41	46	41		54	38	45	5.1	
6:45	54	47	55	47	44	38		54	47	44	41	45	42		55	38	46	5.2	
7:00	52	47	56	48	46	39		54	48	44	42	45	43		56	39	46	4.9	
Max	54	47	56	48	46	41	53	55	50	44	43	47	45		56	41	48	4.9	
Min	45	42	43	42	39	36	51	51	46	39	39	38	40		51	36	42	4.9	
Ave	49	44	49	45	43	38	52	52	48	41	40	42	42		52	38	45	4.7	
SD	2.2	1.3	3.1	1.1	2.0	1.5	0.8	0.9	1.3	1.1	0.9	3.1	1.2		3.1	0.8	1.6	0.8	
90%	47	43	45	43	40	36	52	52	46	40	40	38	40		52	36	43	4.9	
																Median	43		

Two Day Results of Ambient Noise Monitoring



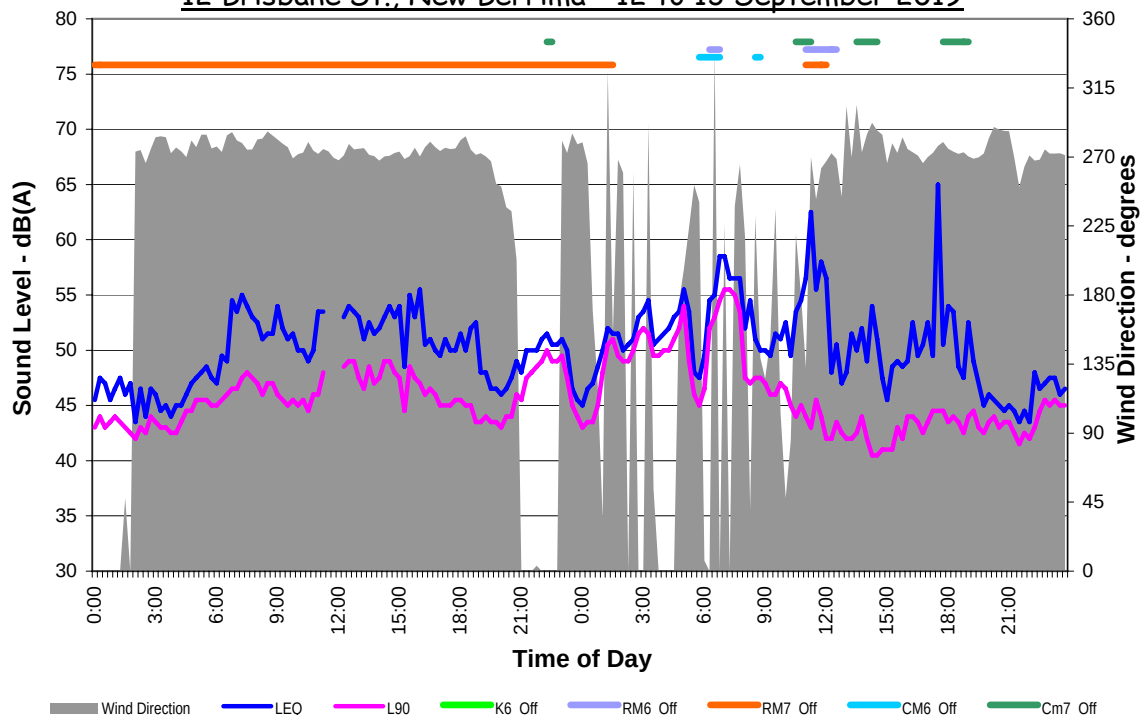
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 12 to 13 September 2019



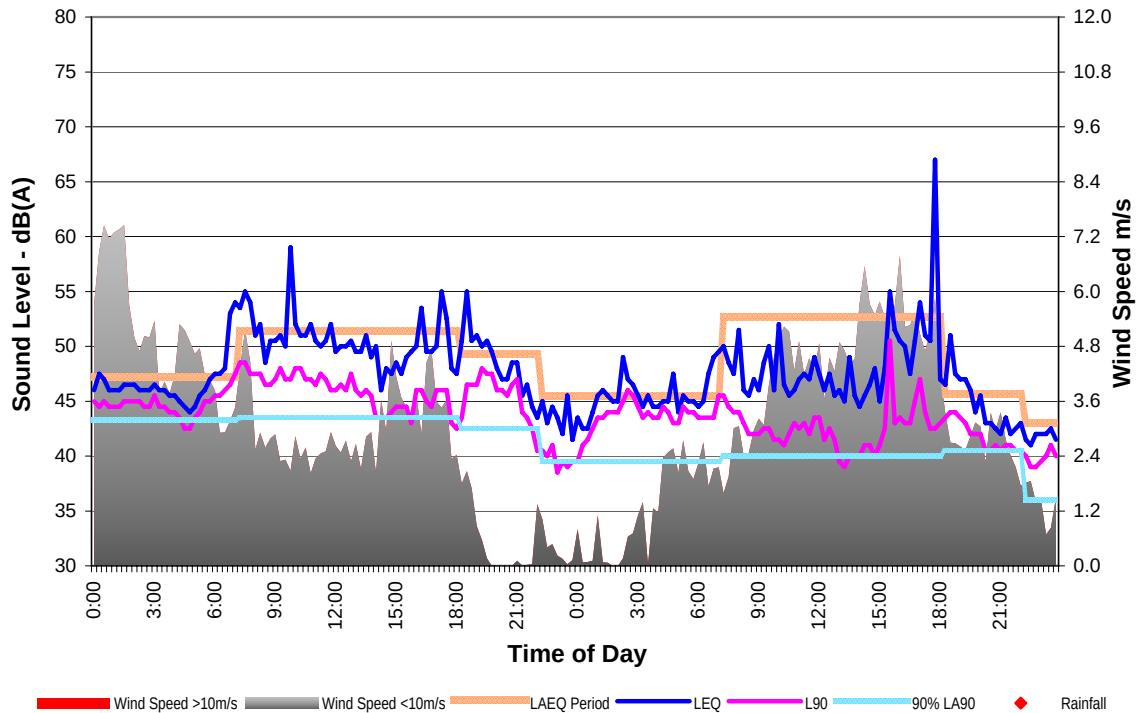
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 12 to 13 September 2019



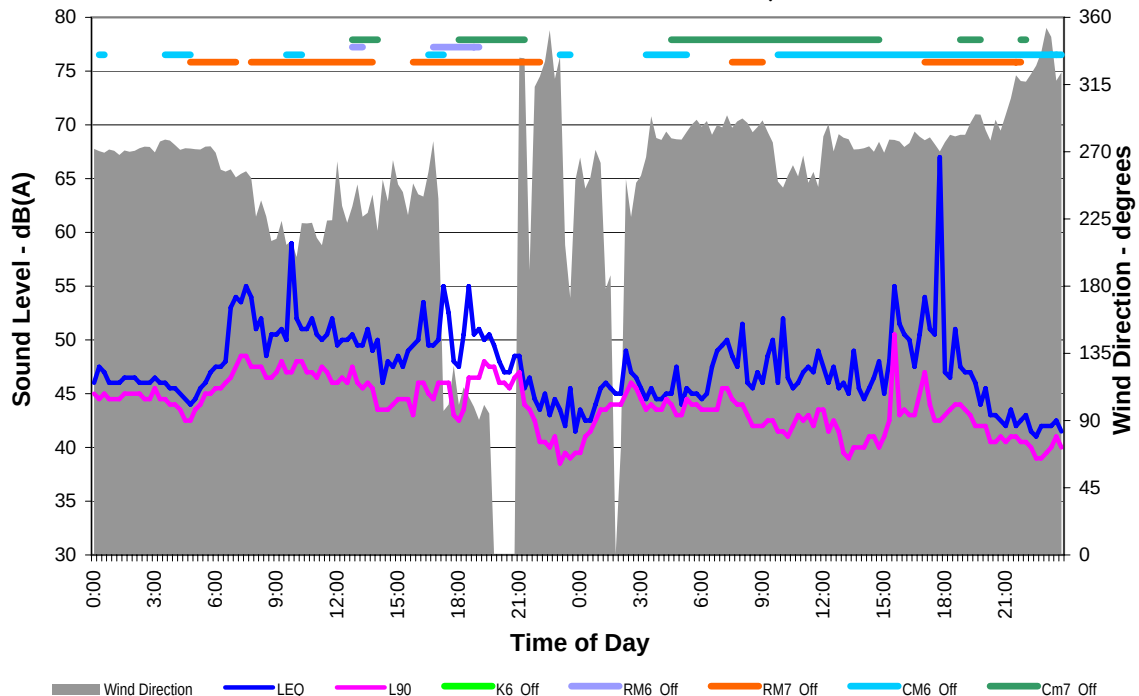
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 14 to 15 September 2019



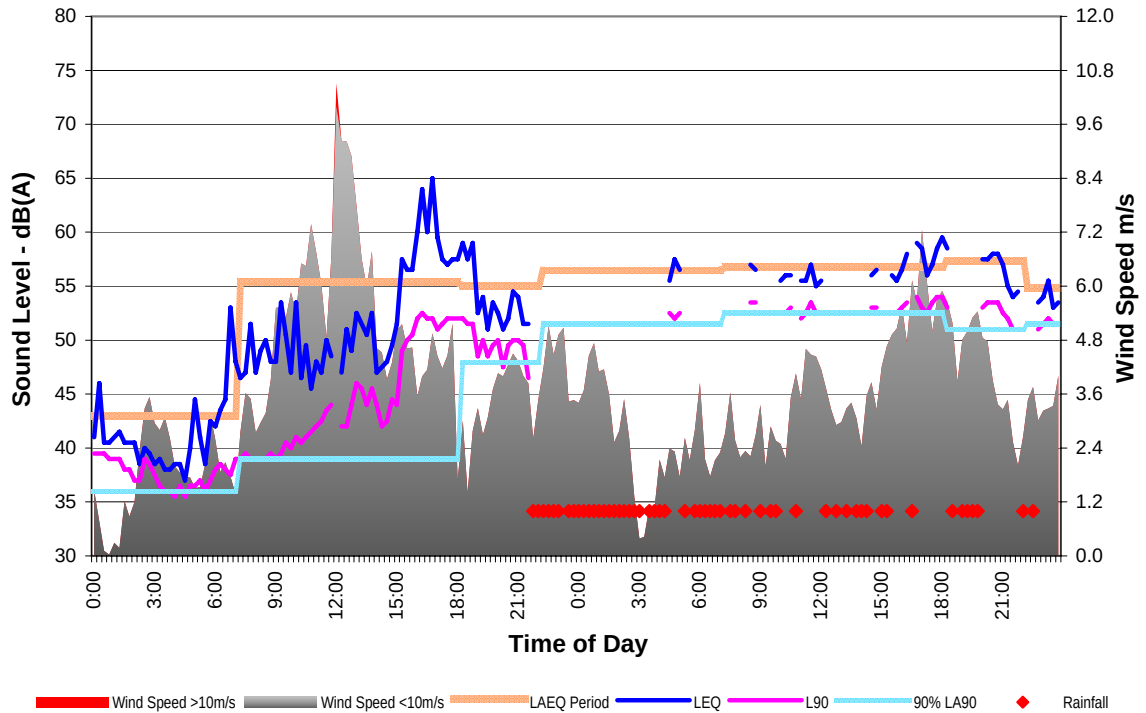
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 14 to 15 September 2019



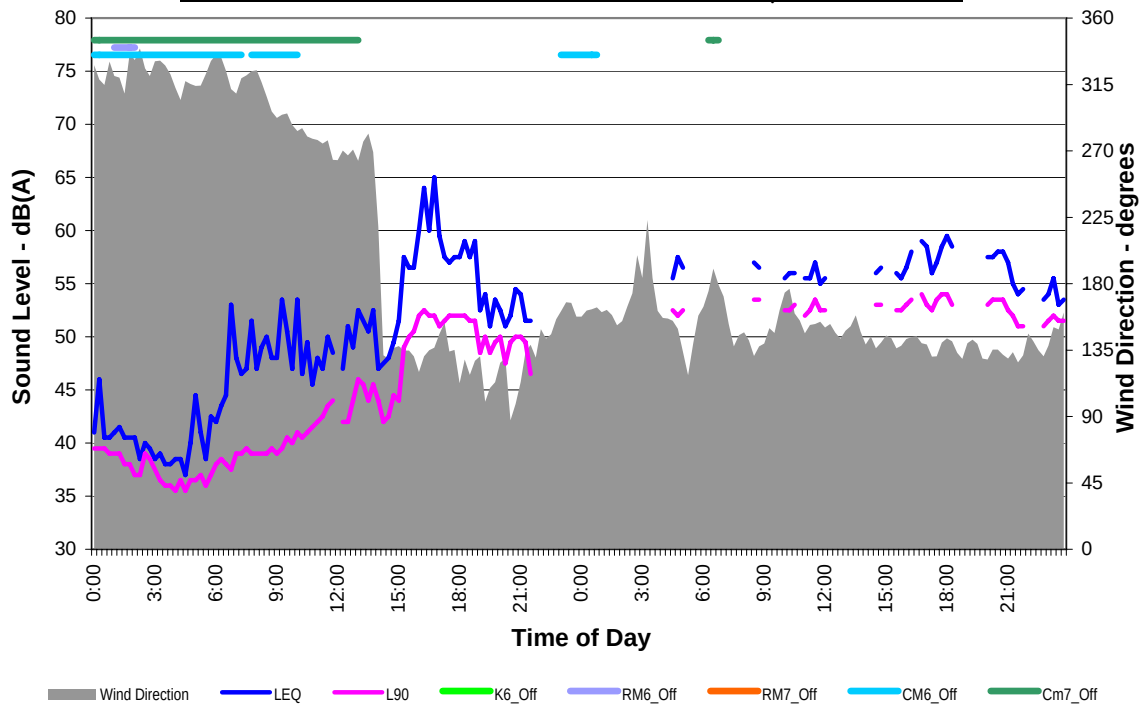
Berrima Cement Works - Ambient - Backaround Noise Survey

12 Brisbane St., New Berrima - 16 to 17 September 2019



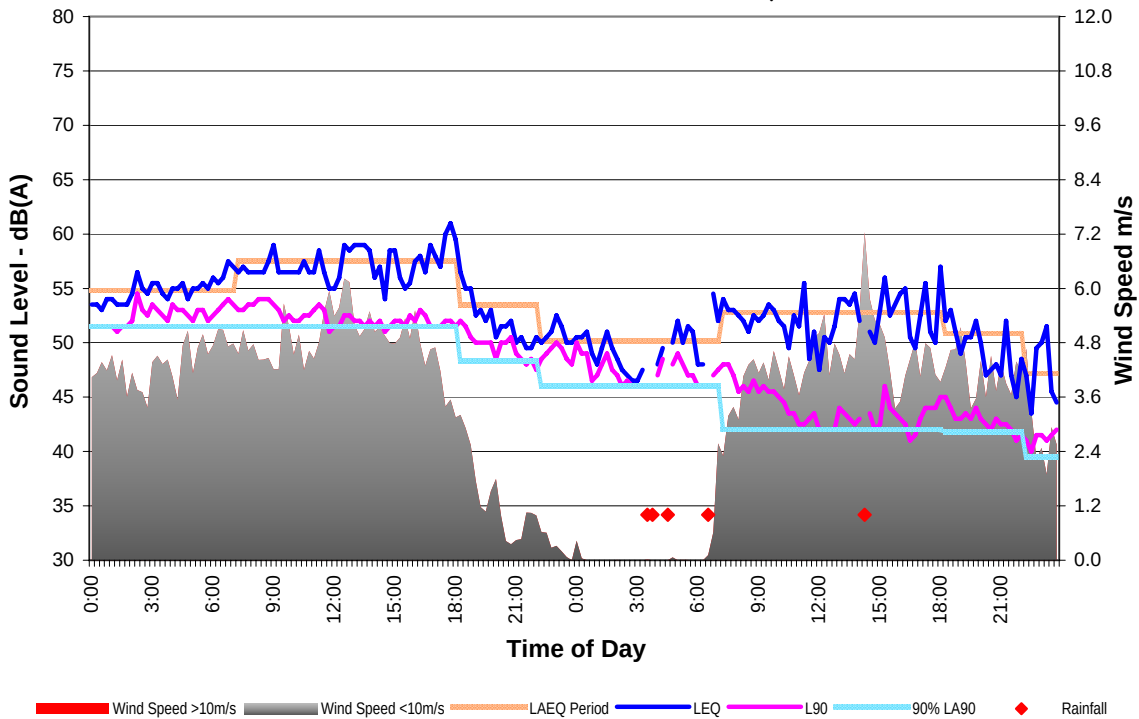
Berrima Cement Works - Ambient - Backaround Noise Survey

12 Brisbane St., New Berrima - 16 to 17 September 2019



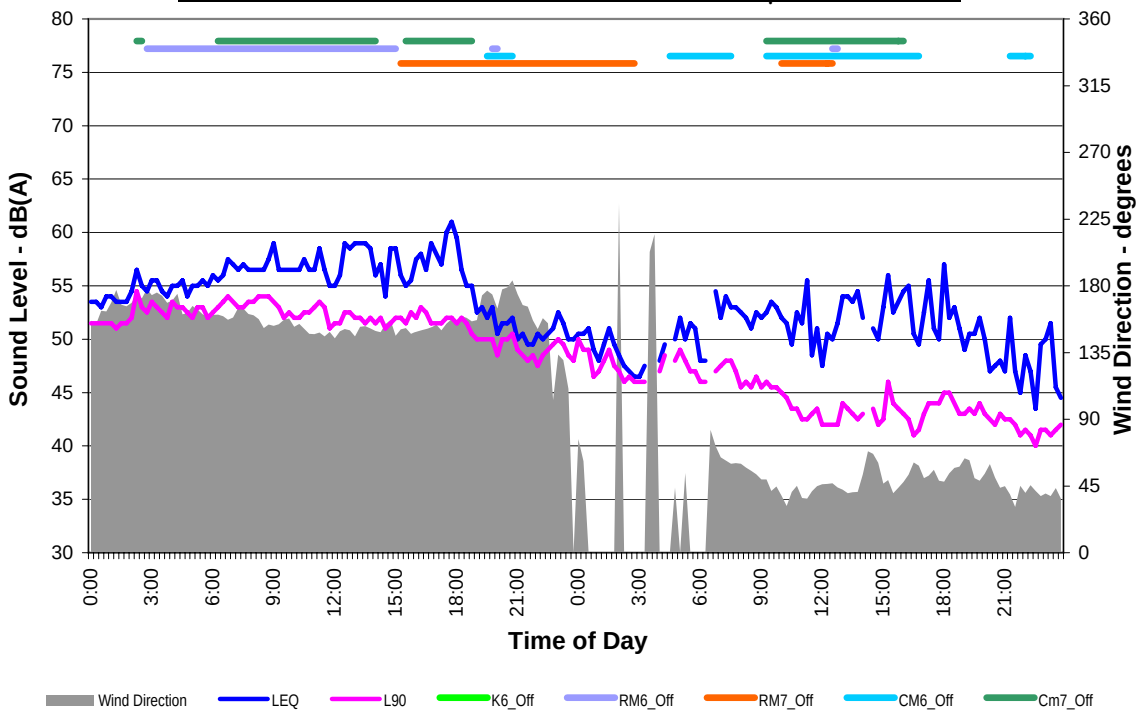
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 18 to 19 September 2019



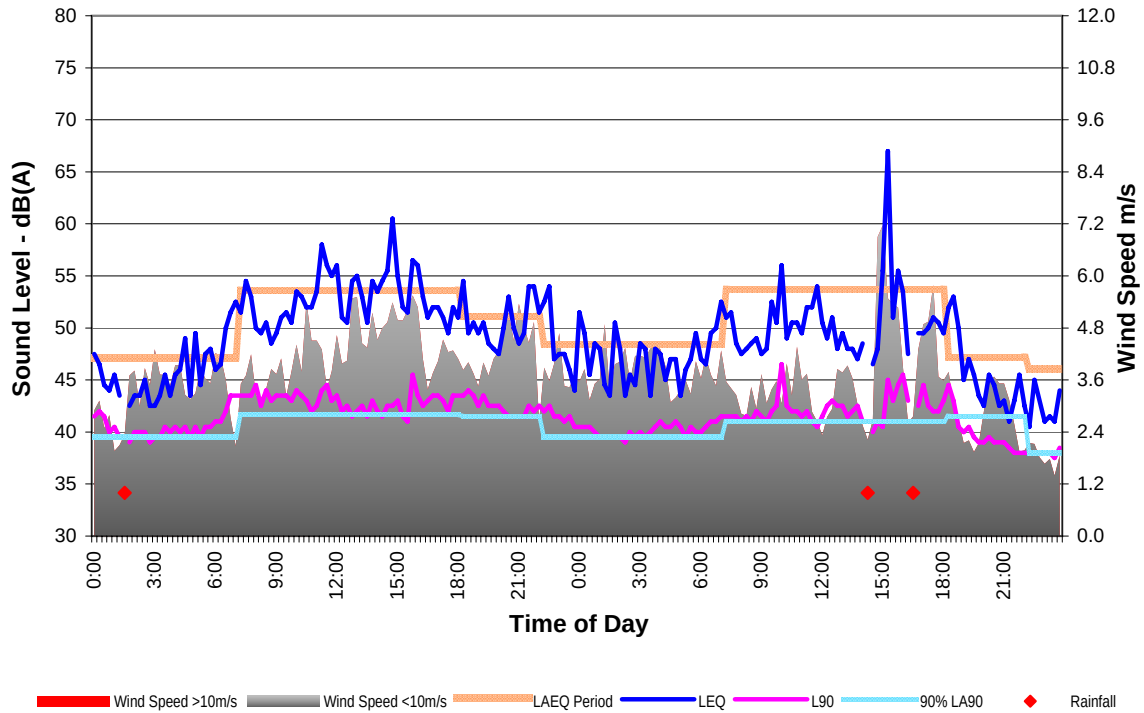
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 18 to 19 September 2019



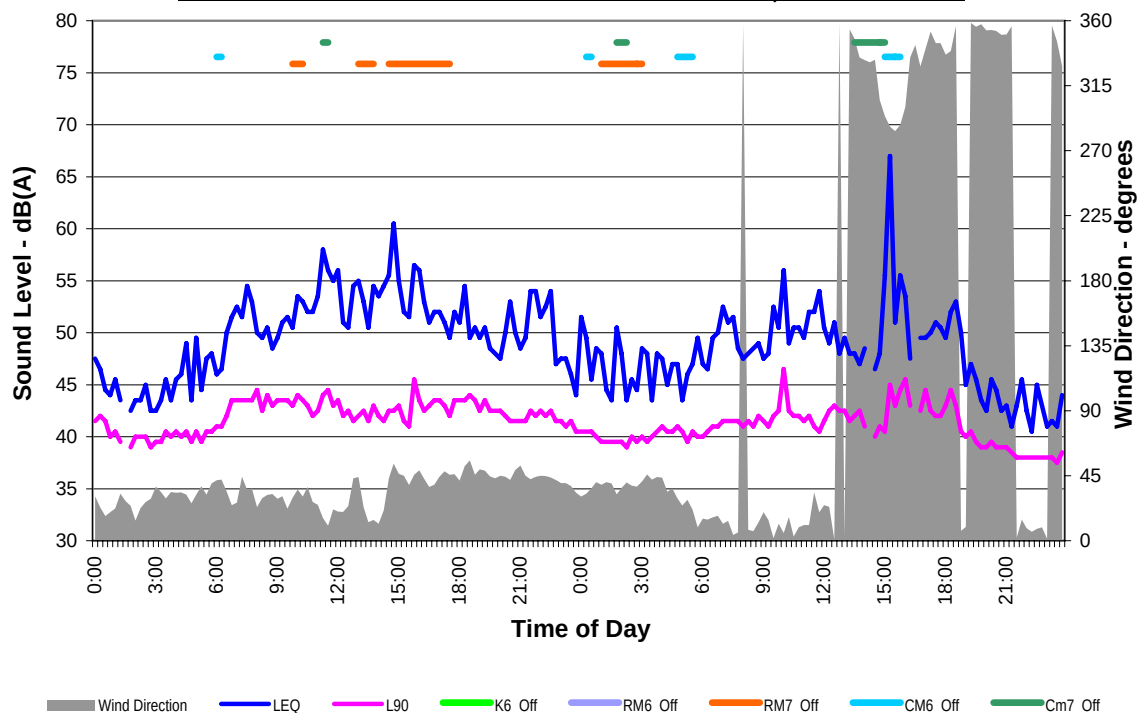
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 20 to 21 September 2019



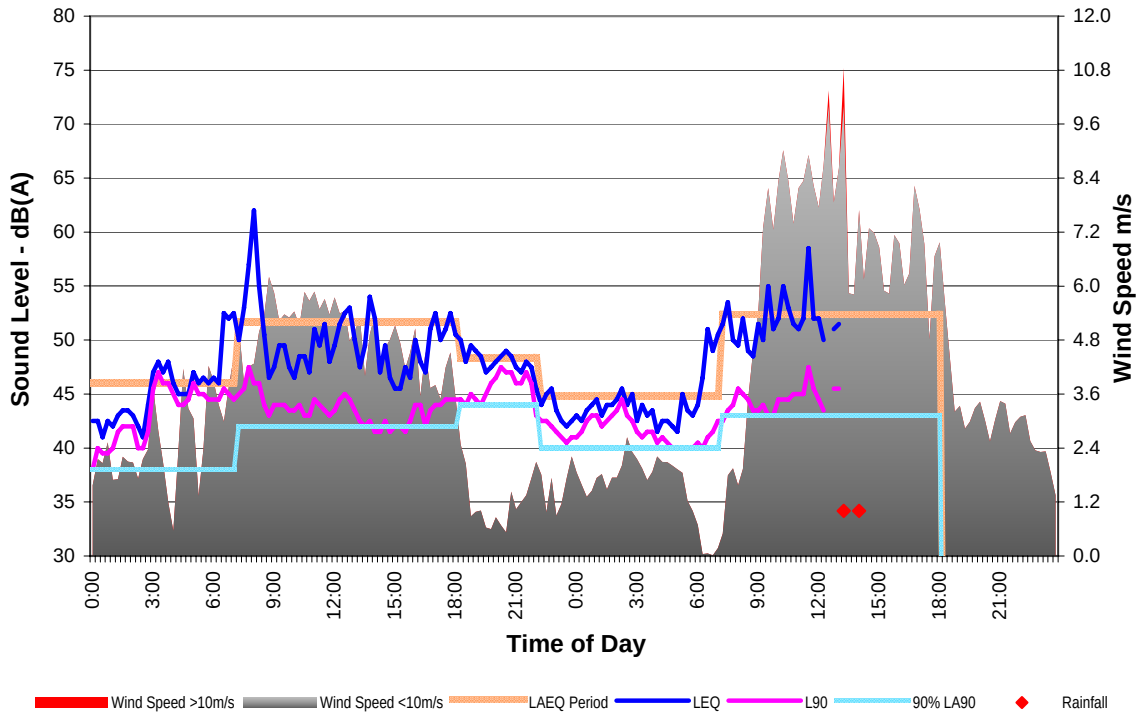
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 20 to 21 September 2019



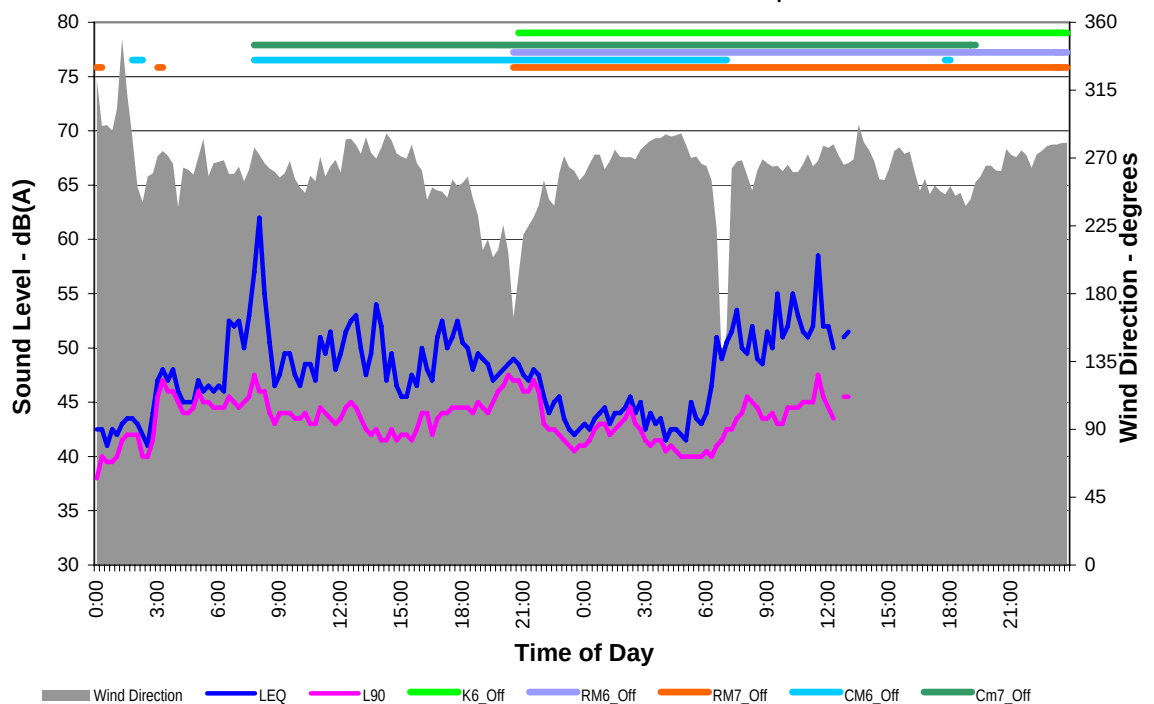
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 22 to 23 September 2019



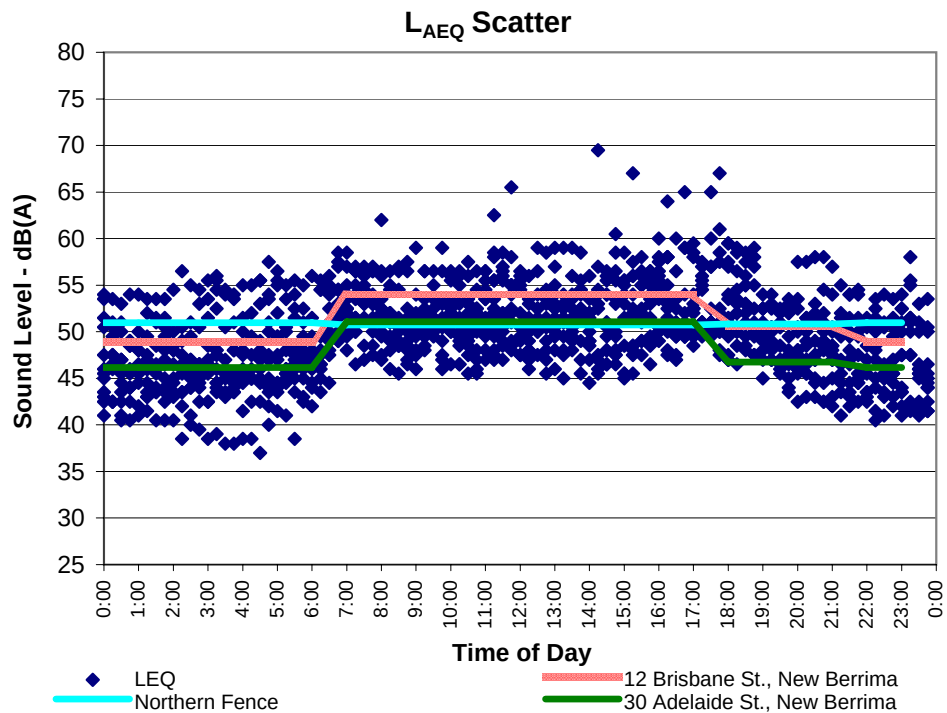
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 22 to 23 September 2019



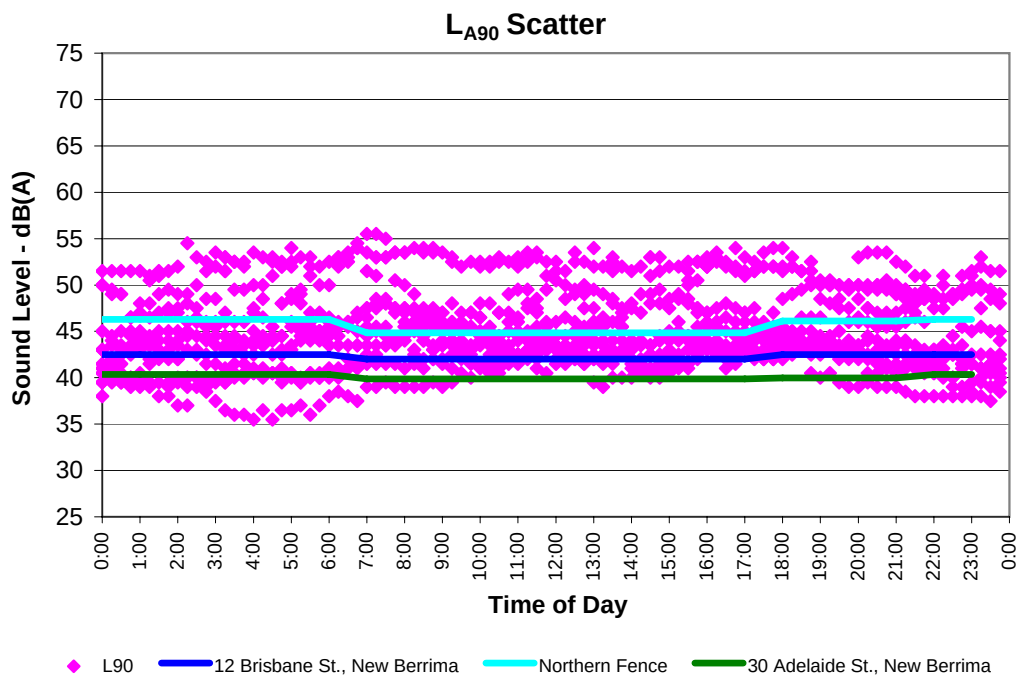
Berrima Cement Works - Ambient - Background Noise

12 Brisbane St., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

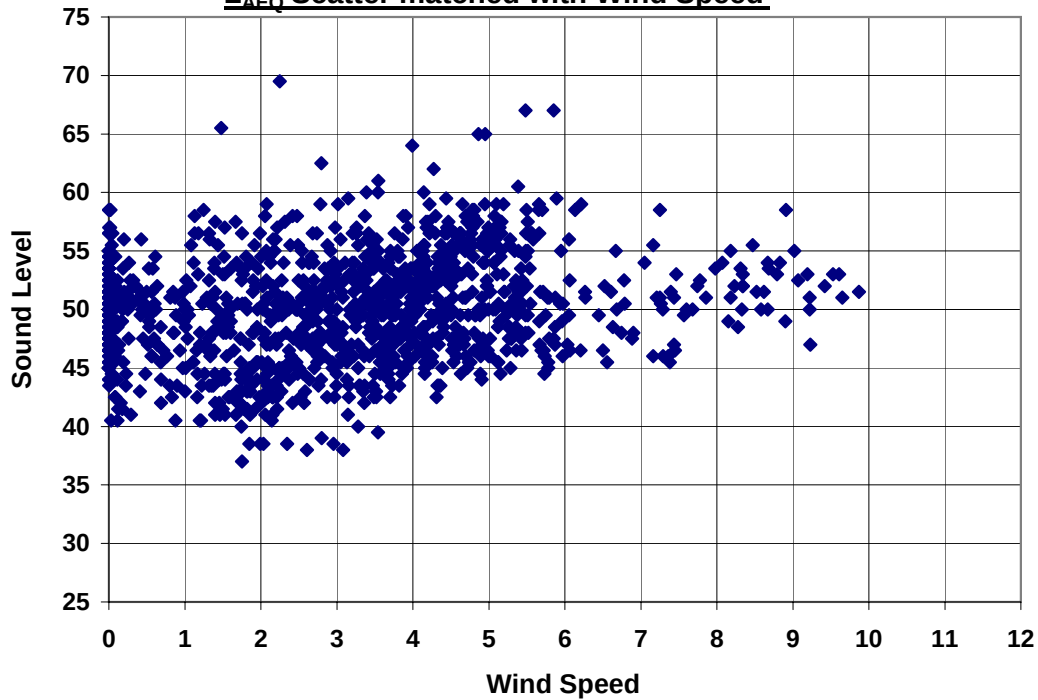
12 Brisbane St., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

12 Brisbane St., New Berrima - 10 September to 2 October 2019

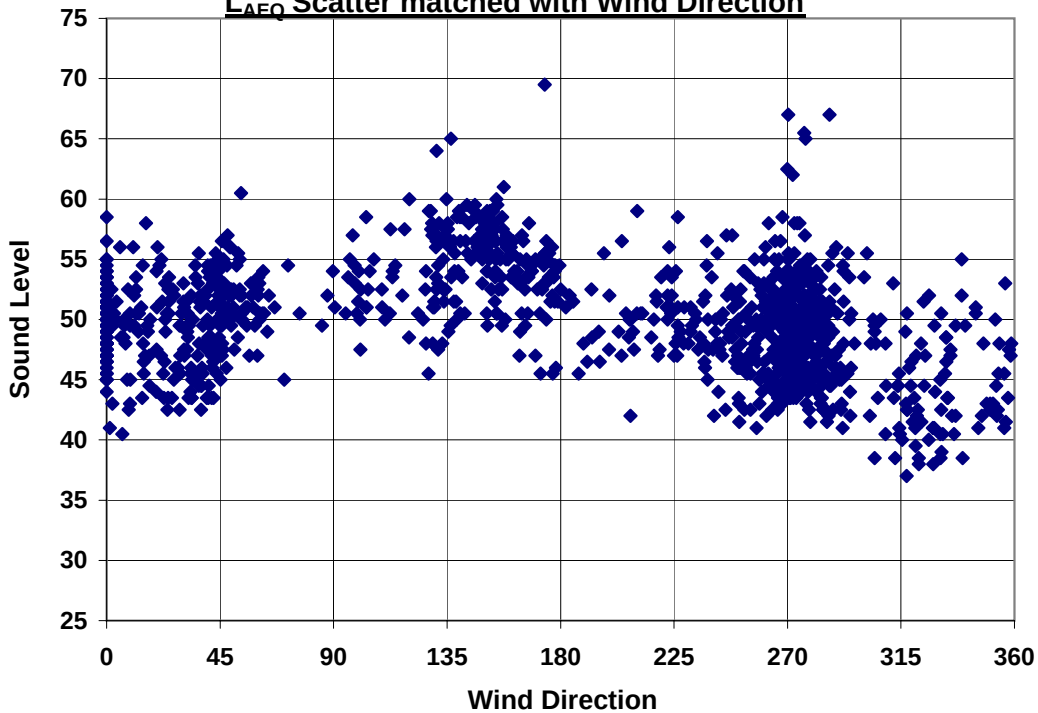
L_{AEQ} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

12 Brisbane St., New Berrima - 10 September to 2 October 2019

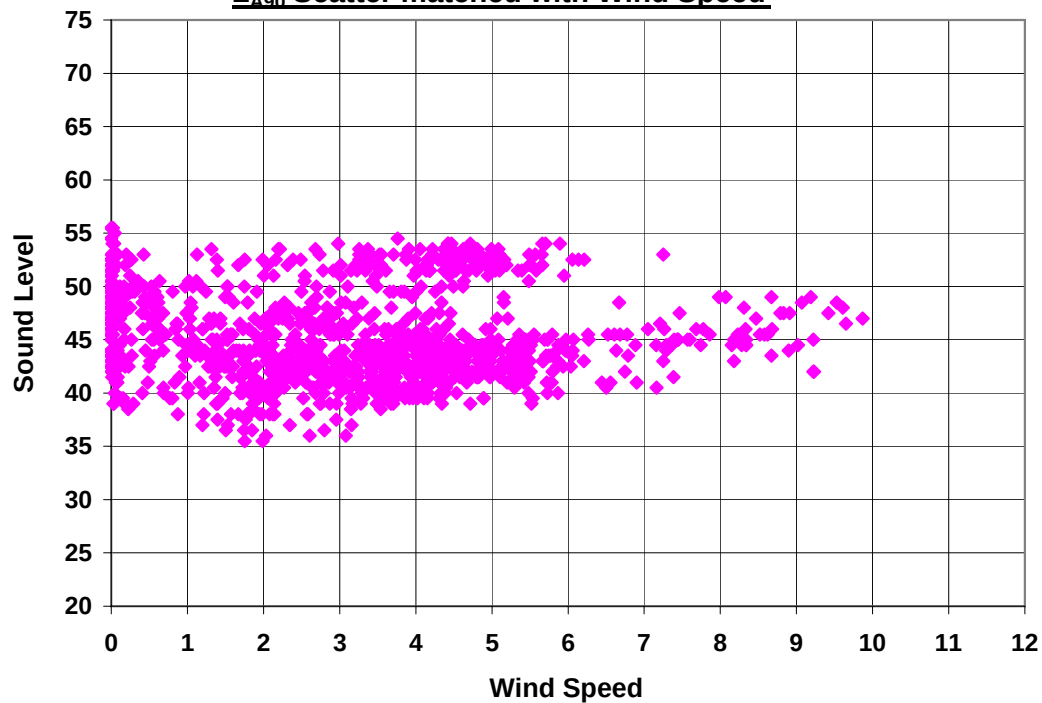
L_{AEQ} Scatter matched with Wind Direction



Berrima Cement Works - Ambient - Background Noise

12 Brisbane St., New Berrima - 10 September to 2 October 2019

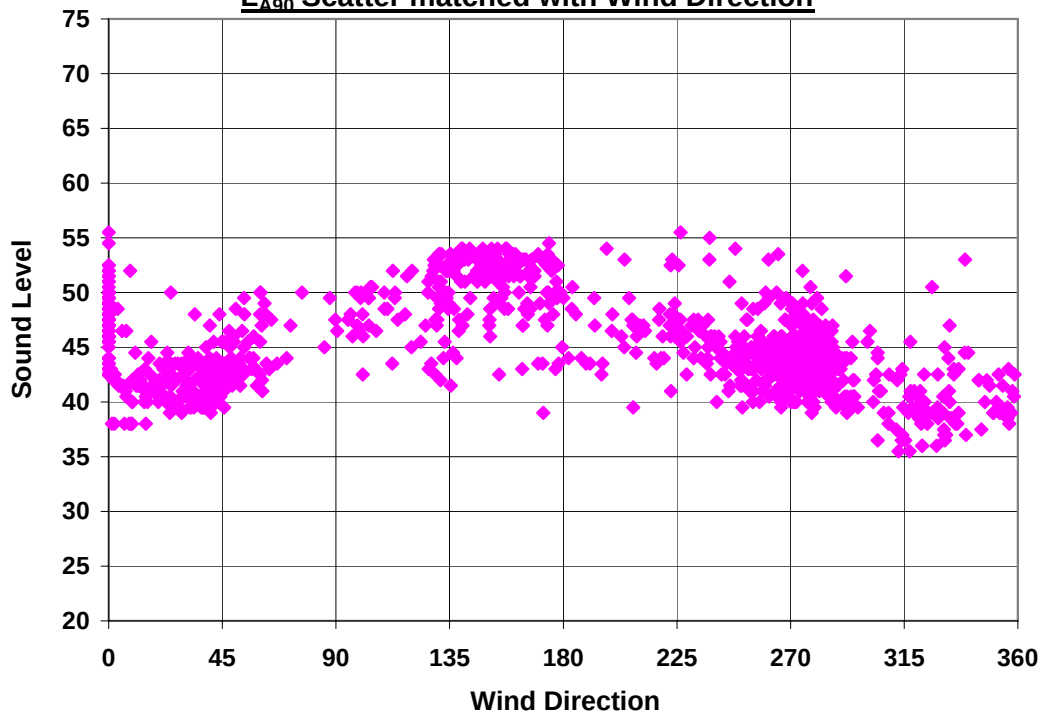
L_{A90} Scatter matched with Wind Speed



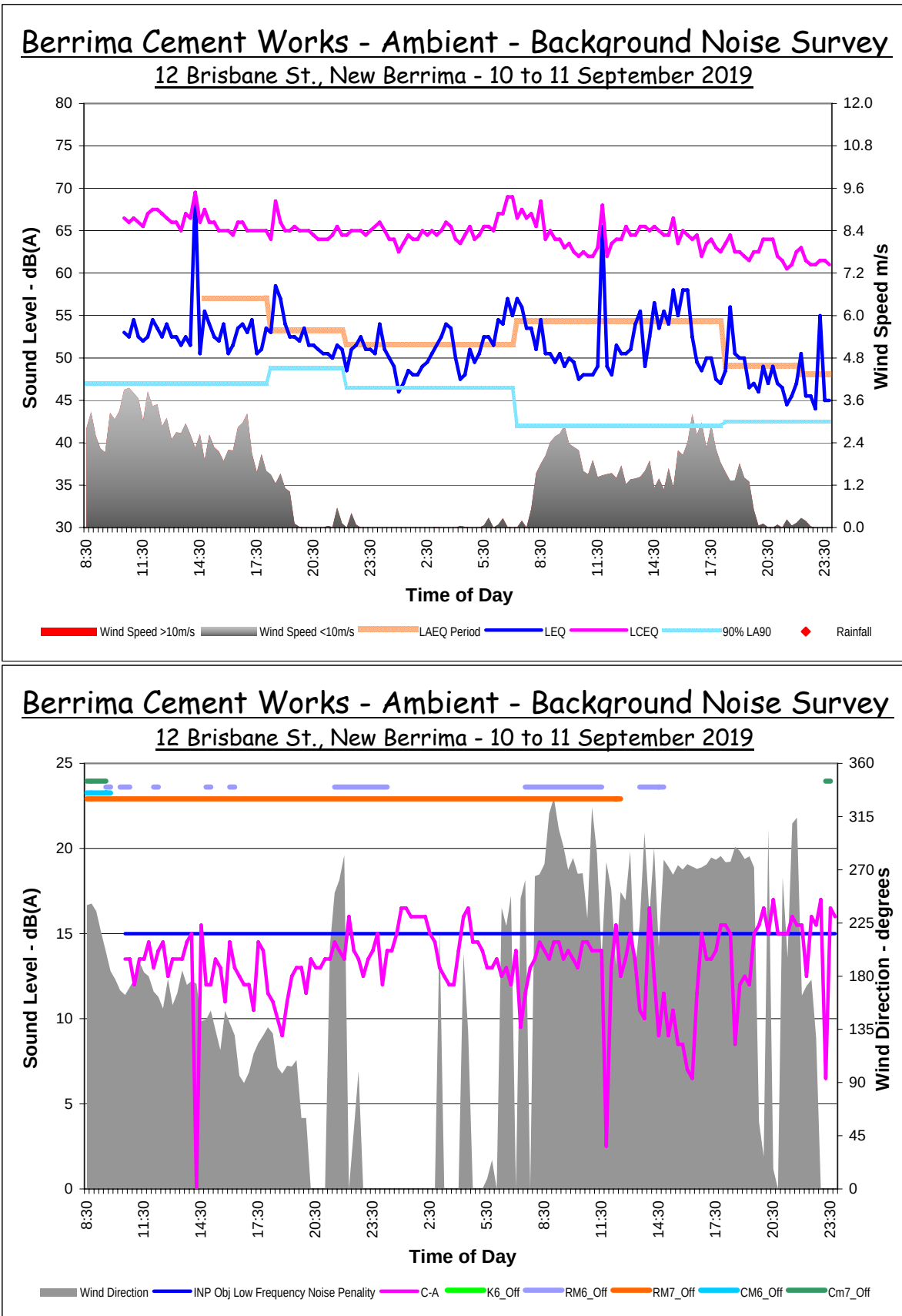
Berrima Cement Works - Ambient - Background Noise

12 Brisbane St., New Berrima - 10 September to 2 October 2019

L_{A90} Scatter matched with Wind Direction

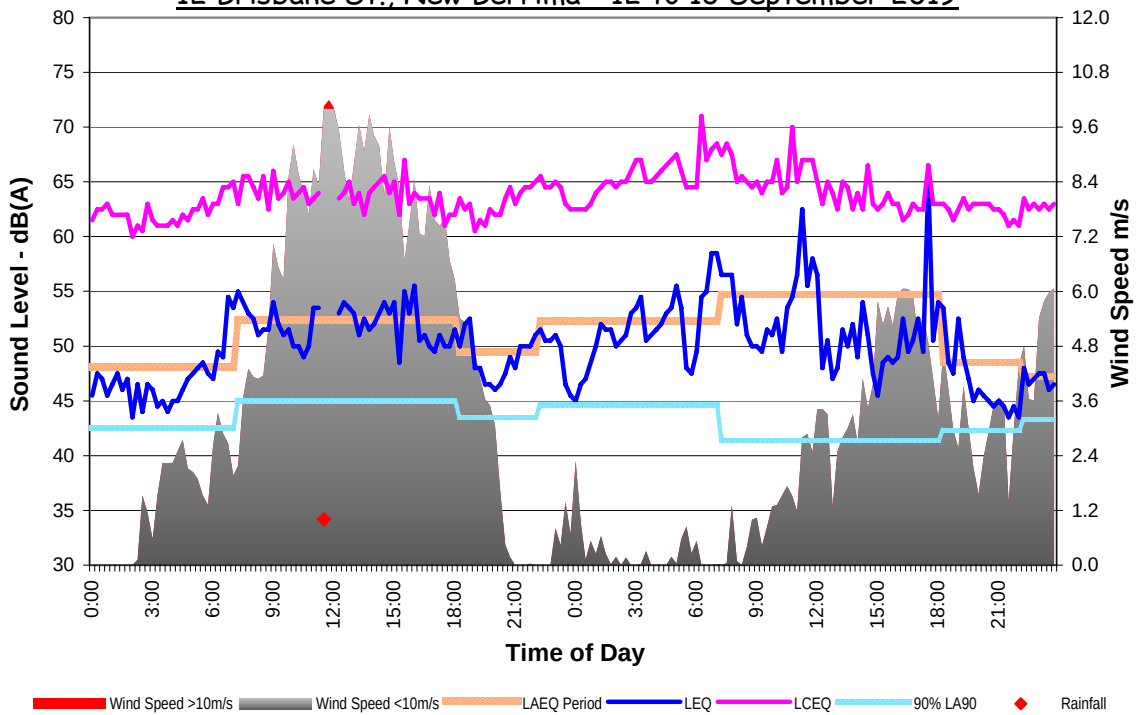


Two Day Results of Ambient Noise Monitoring L_{Ceq} & L_{Ceq-Laeq}



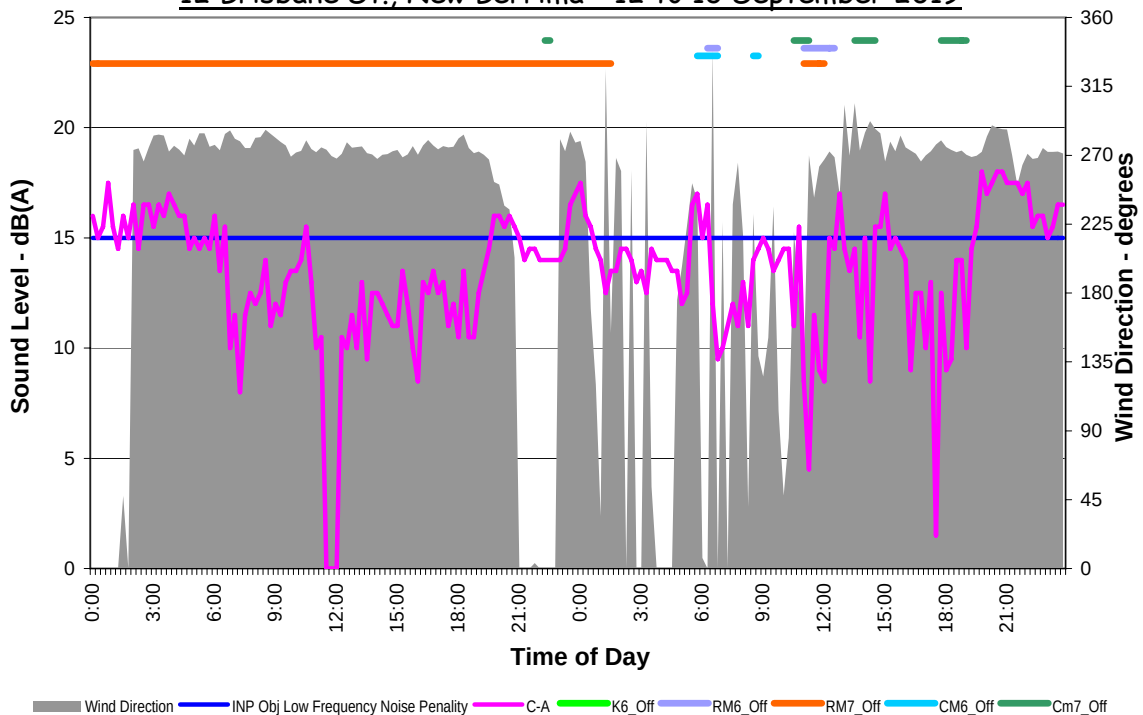
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 12 to 13 September 2019



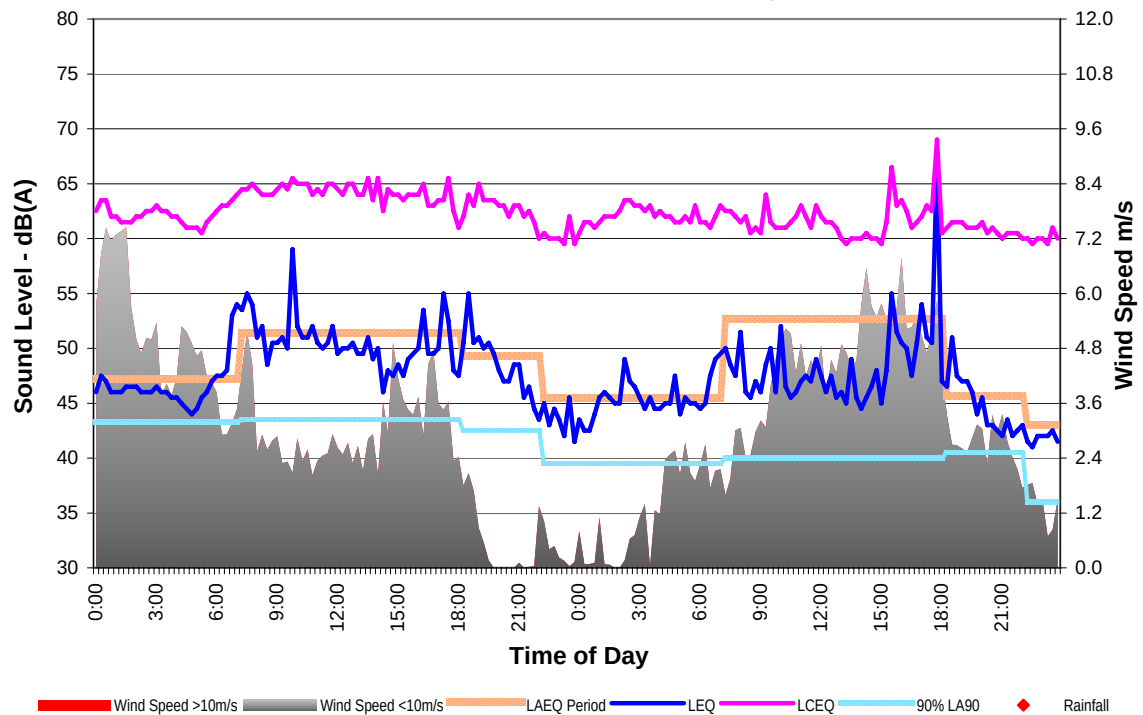
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 12 to 13 September 2019



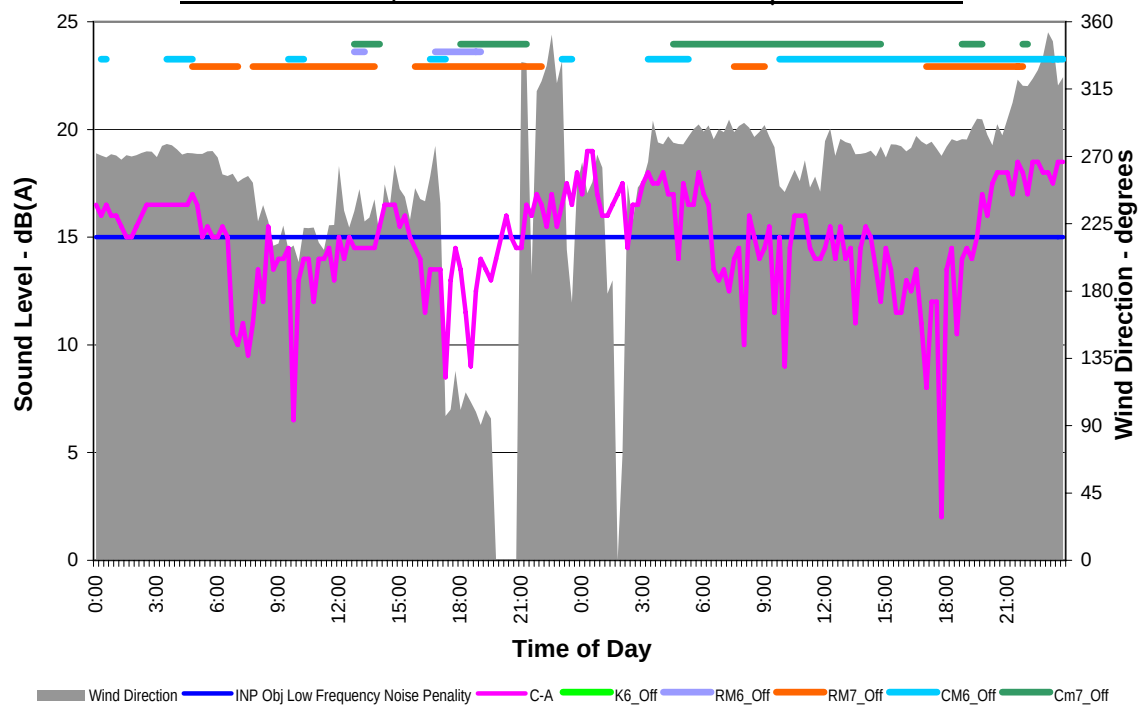
Berrima Cement Works - Ambient - Background Noise Survey

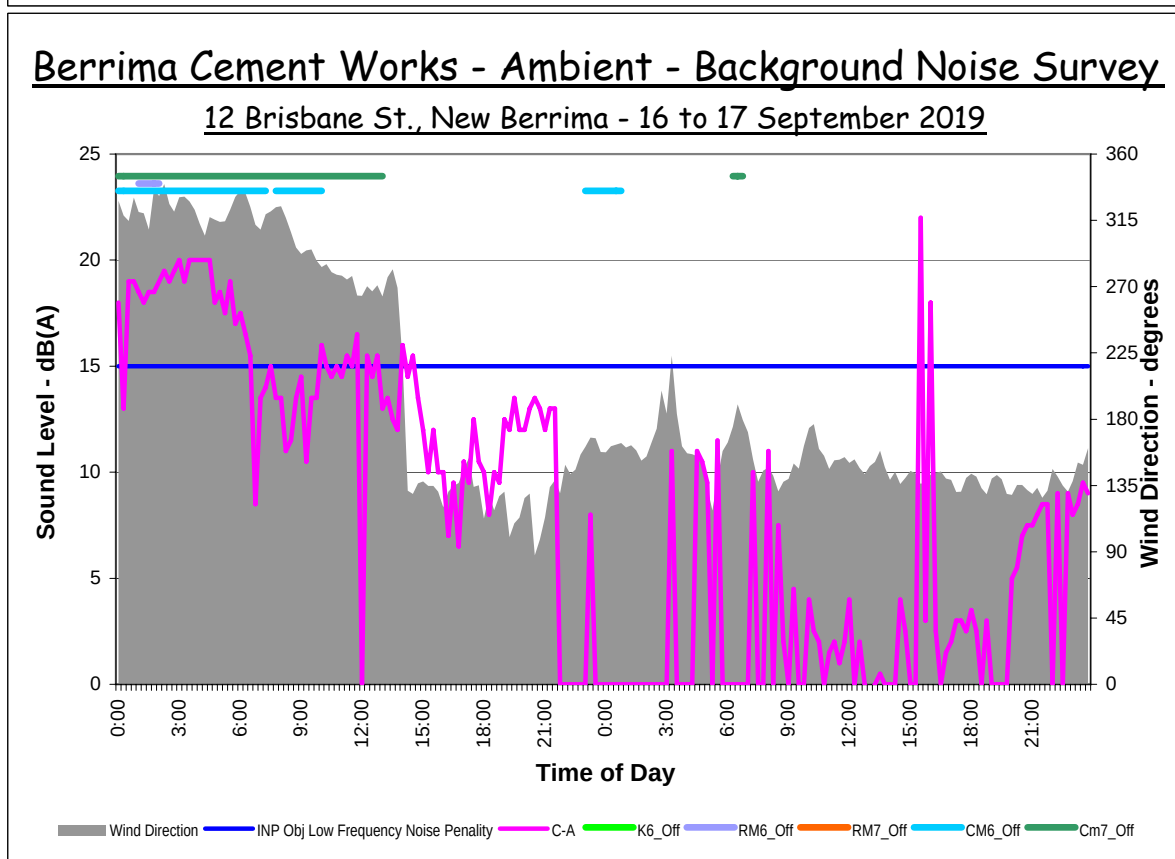
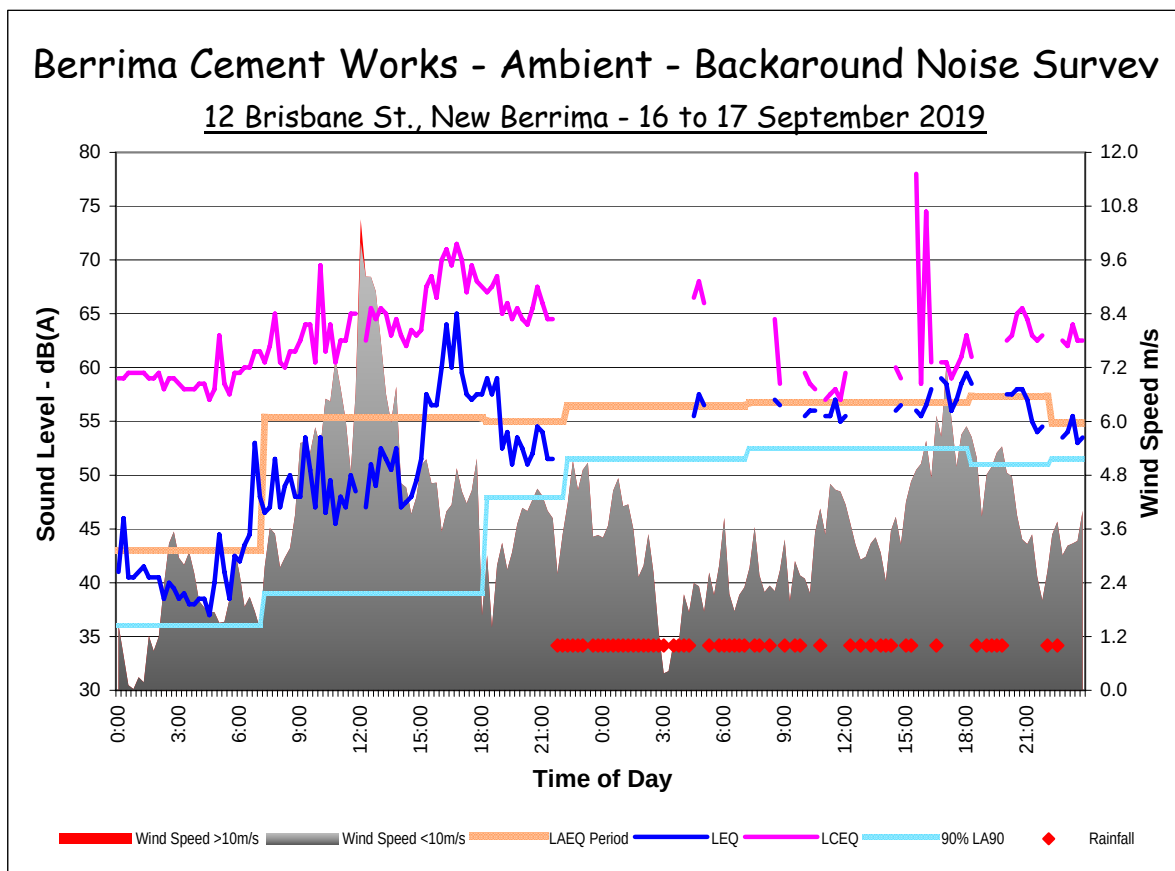
12 Brisbane St., New Berrima - 14 to 15 September 2019



Berrima Cement Works - Ambient - Background Noise Survey

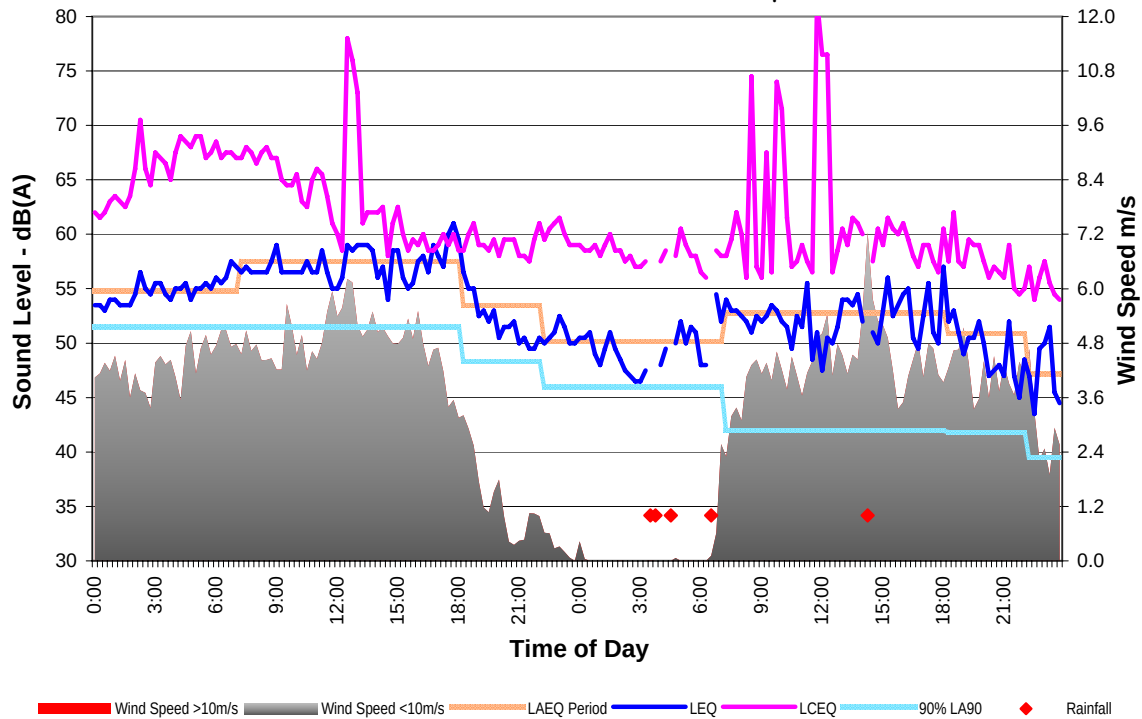
12 Brisbane St., New Berrima - 14 to 15 September 2019





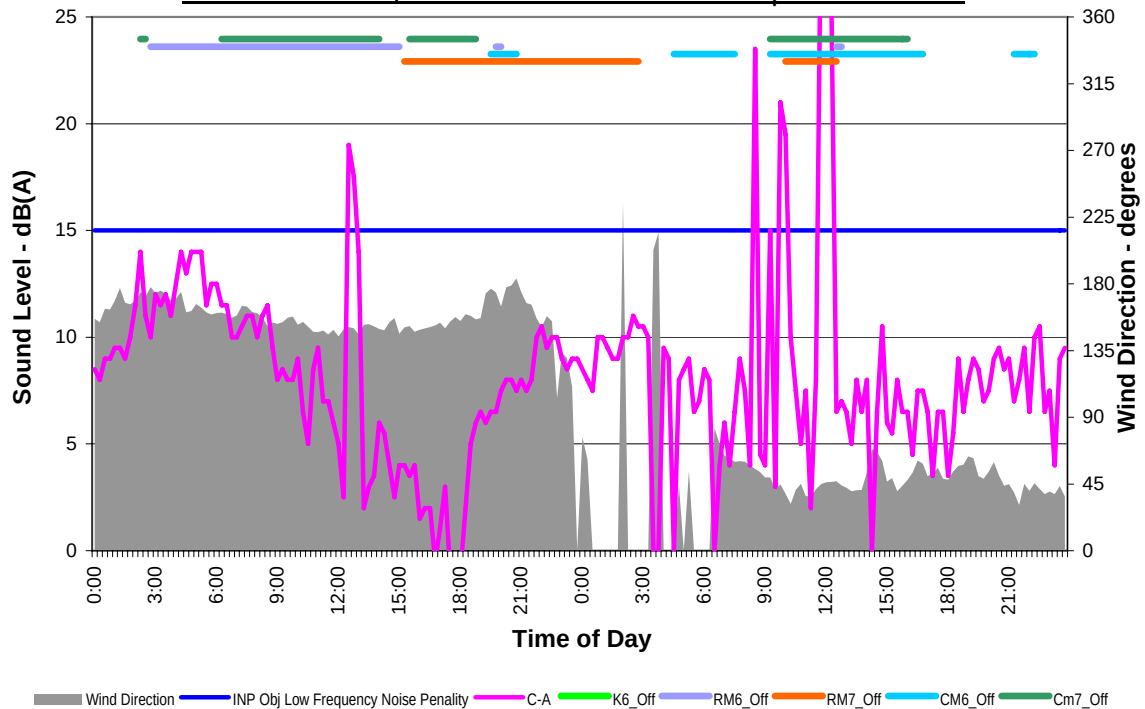
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 18 to 19 September 2019



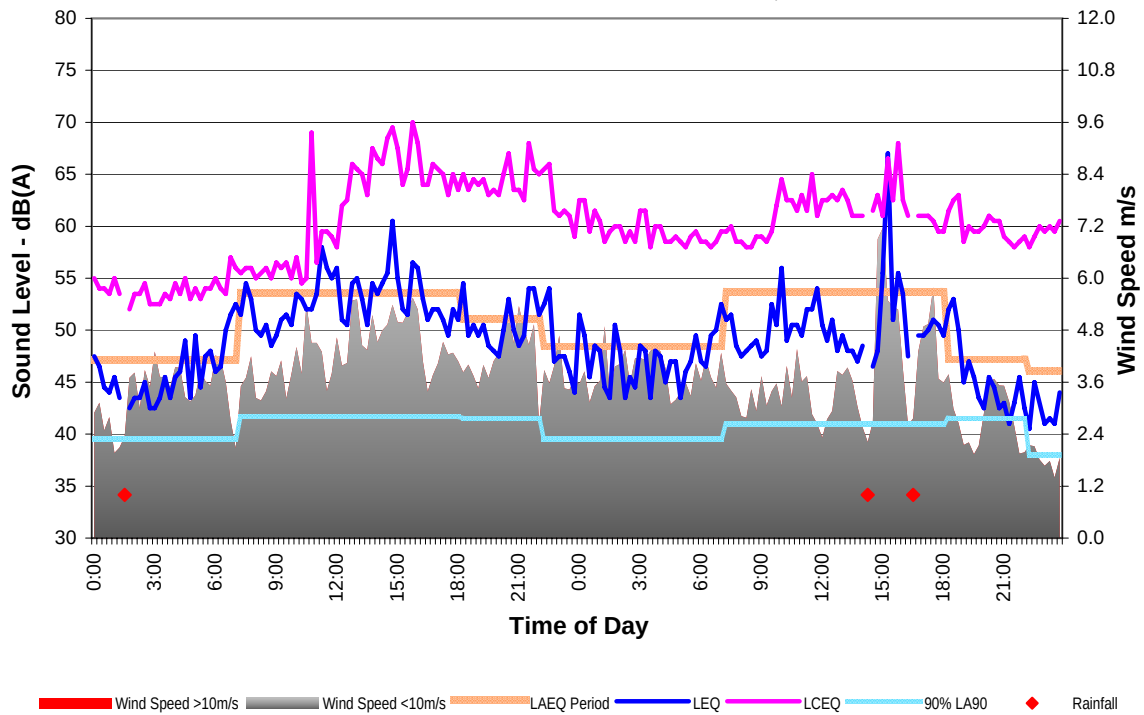
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 18 to 19 September 2019



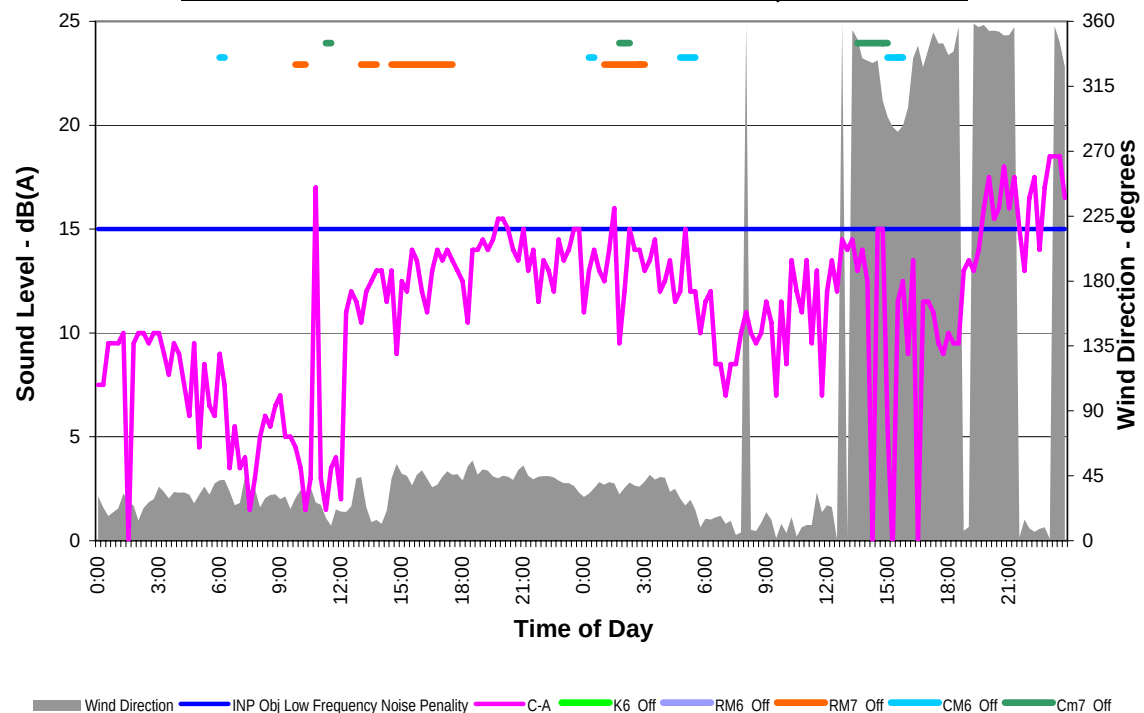
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 20 to 21 September 2019



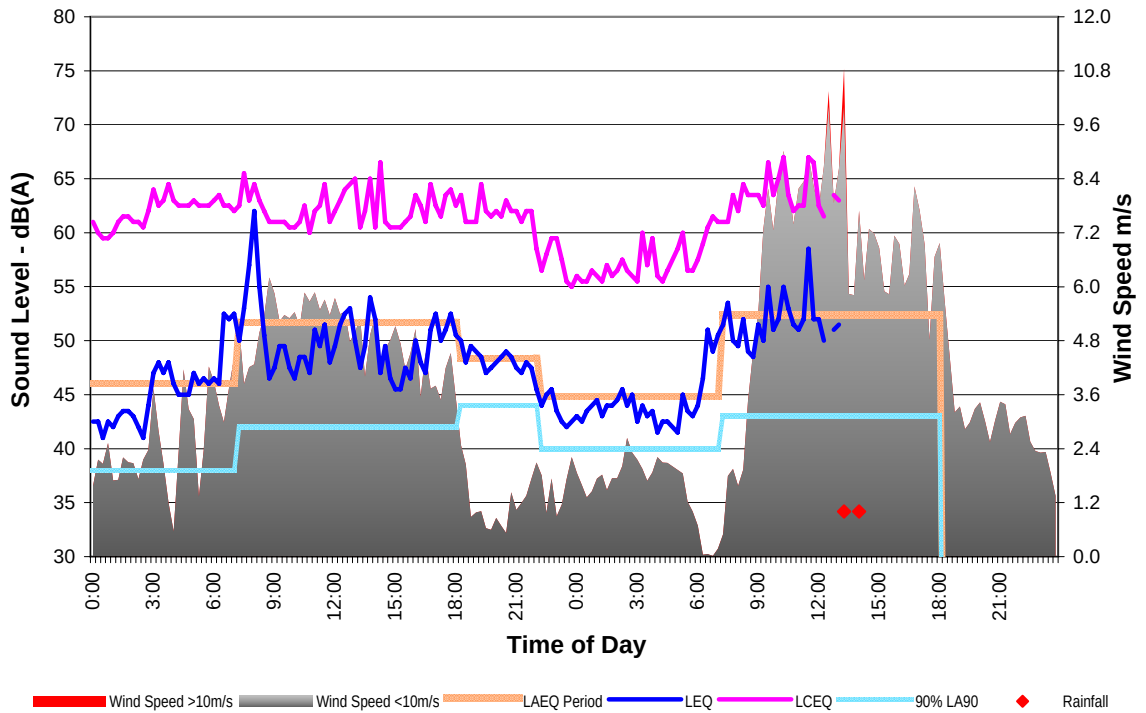
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 20 to 21 September 2019



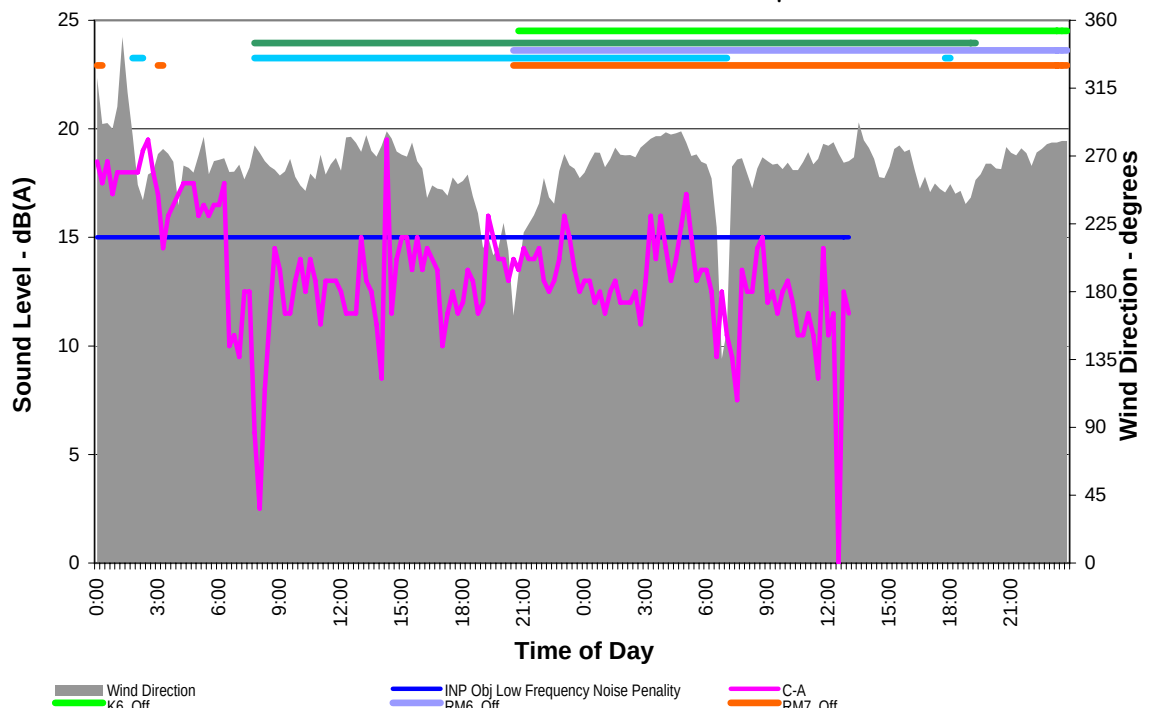
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 22 to 23 September 2019

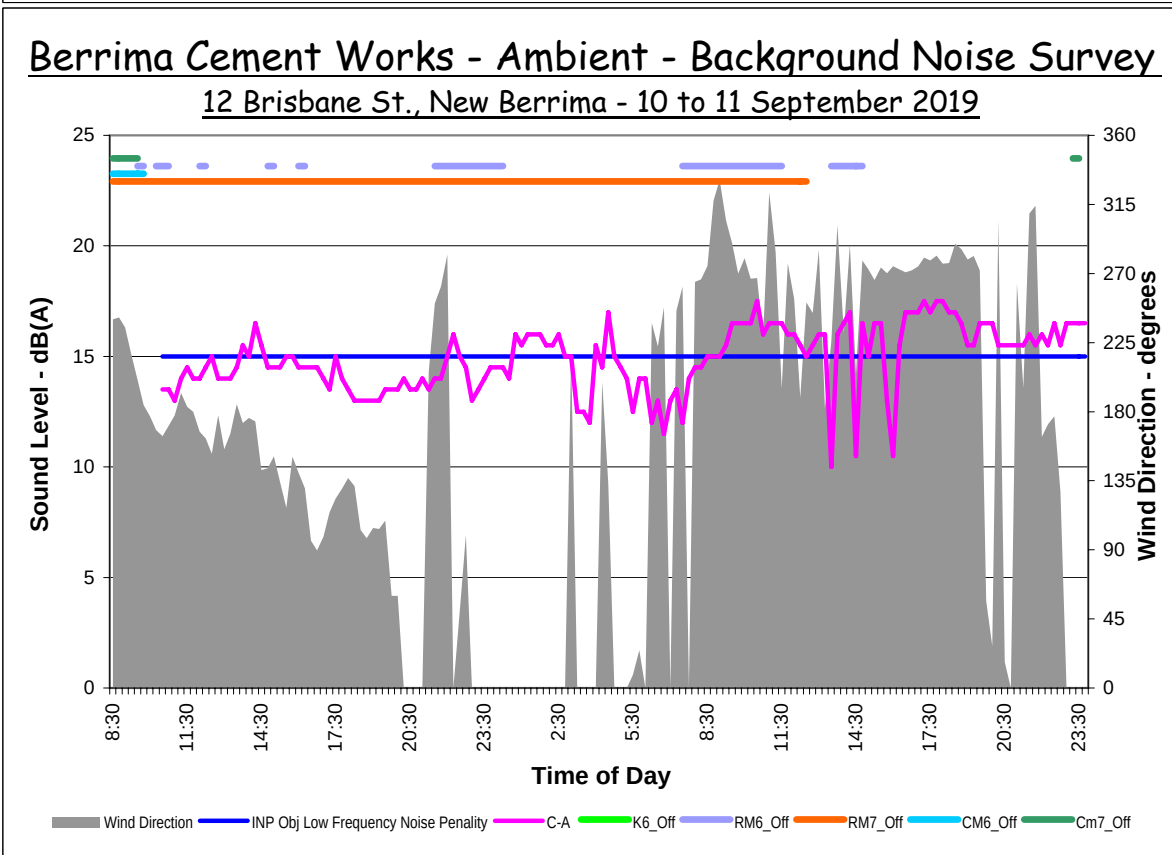
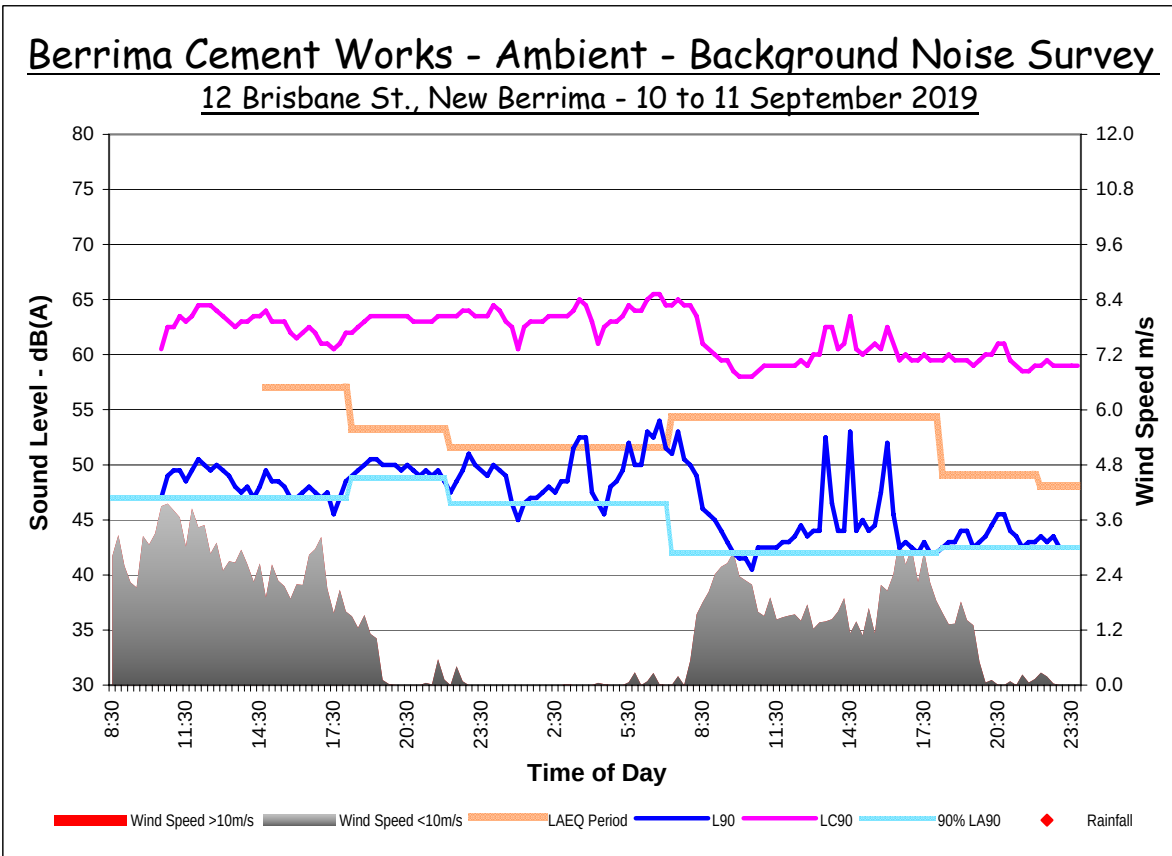


Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 22 to 23 September 2019

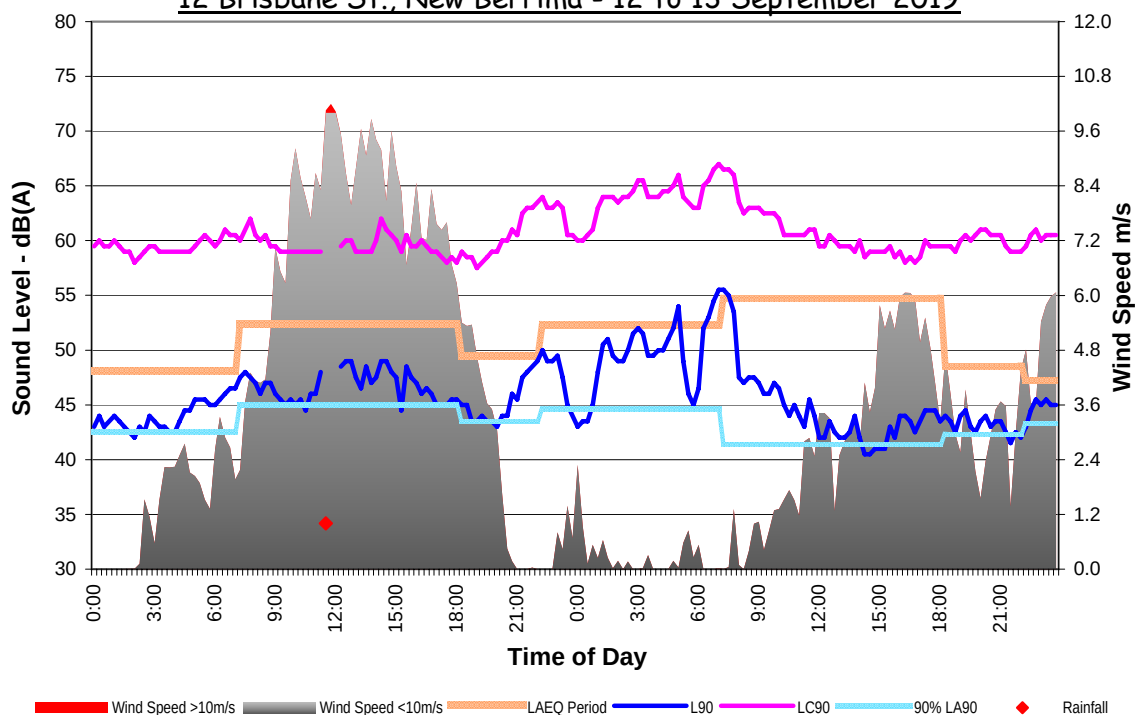


Two Day Results of Ambient Noise Monitoring LC90 & LC90-LA90



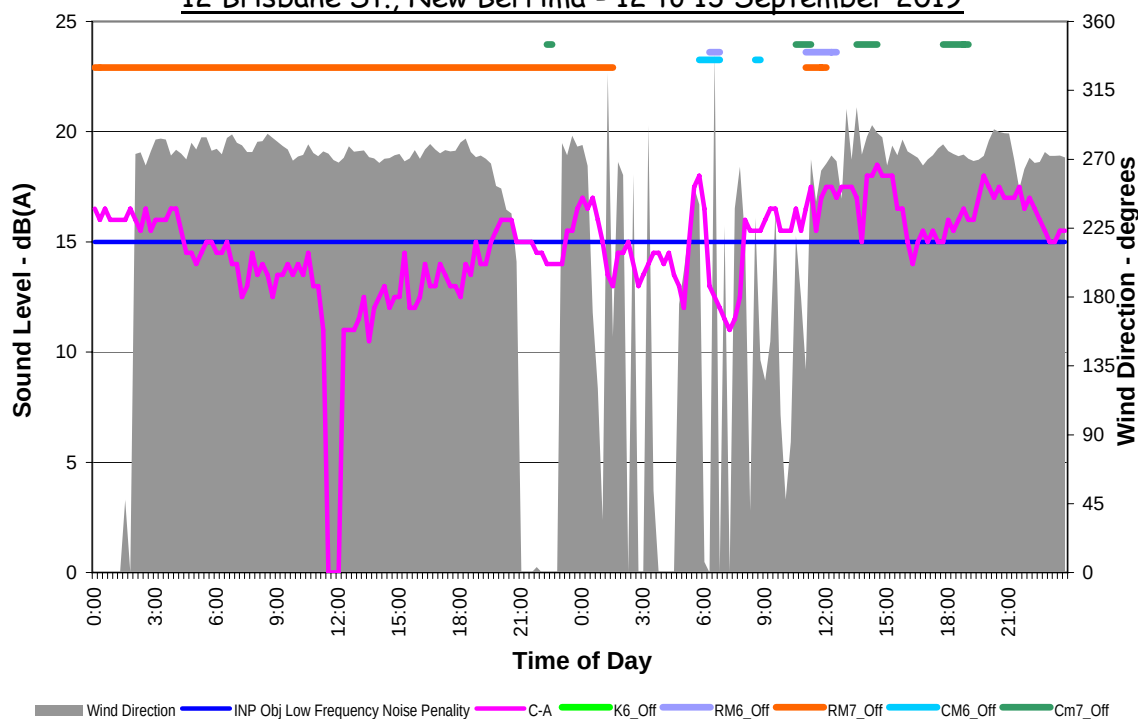
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 12 to 13 September 2019



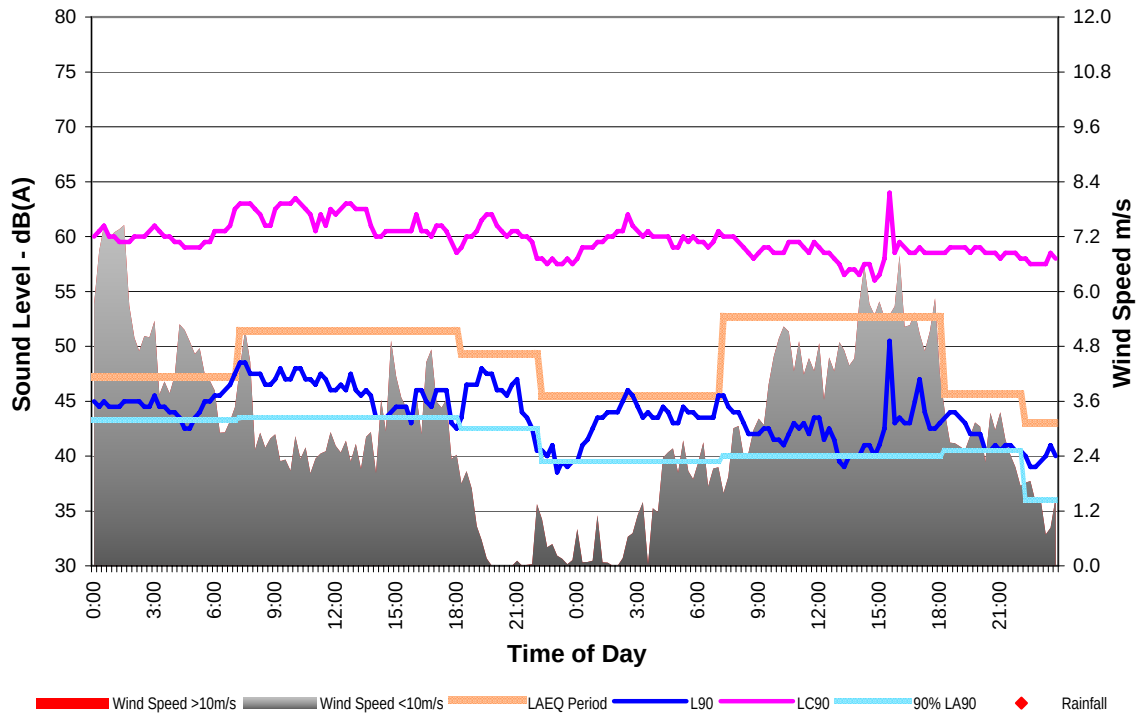
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 12 to 13 September 2019



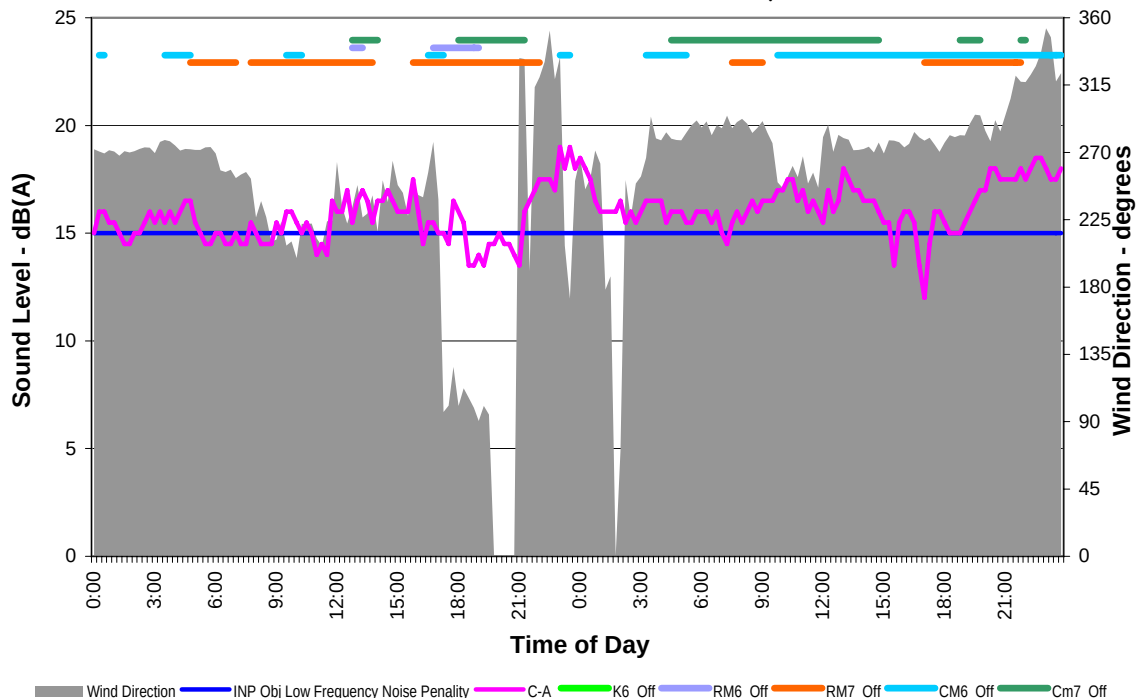
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 14 to 15 September 2019



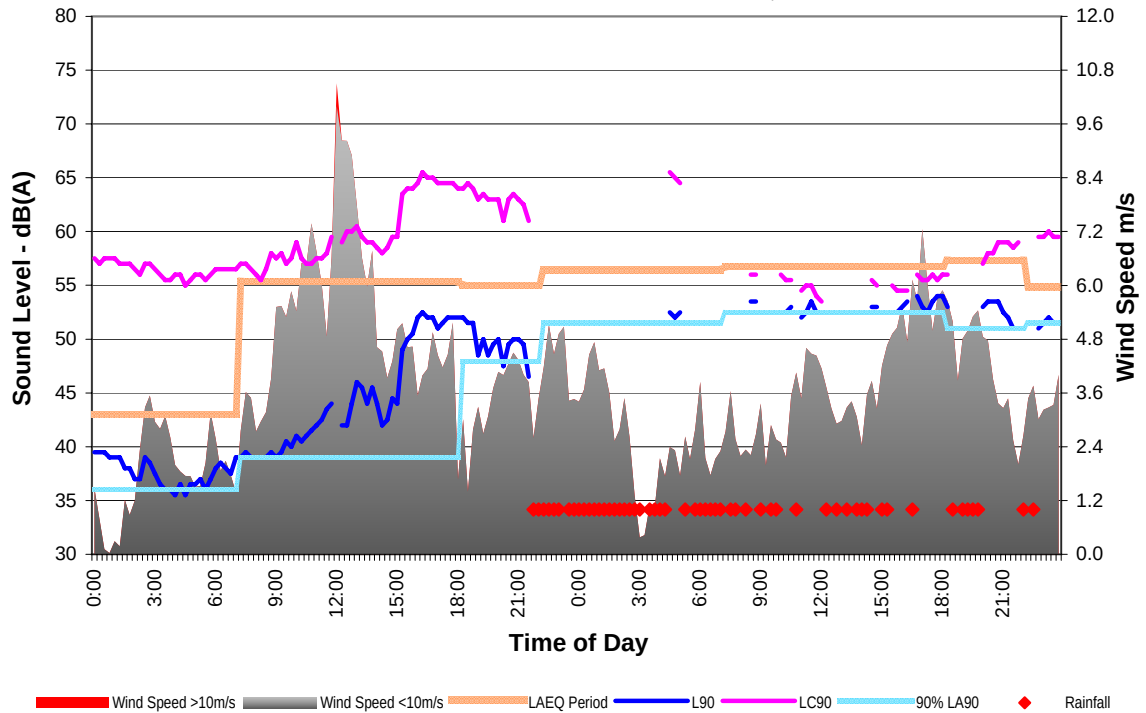
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 14 to 15 September 2019



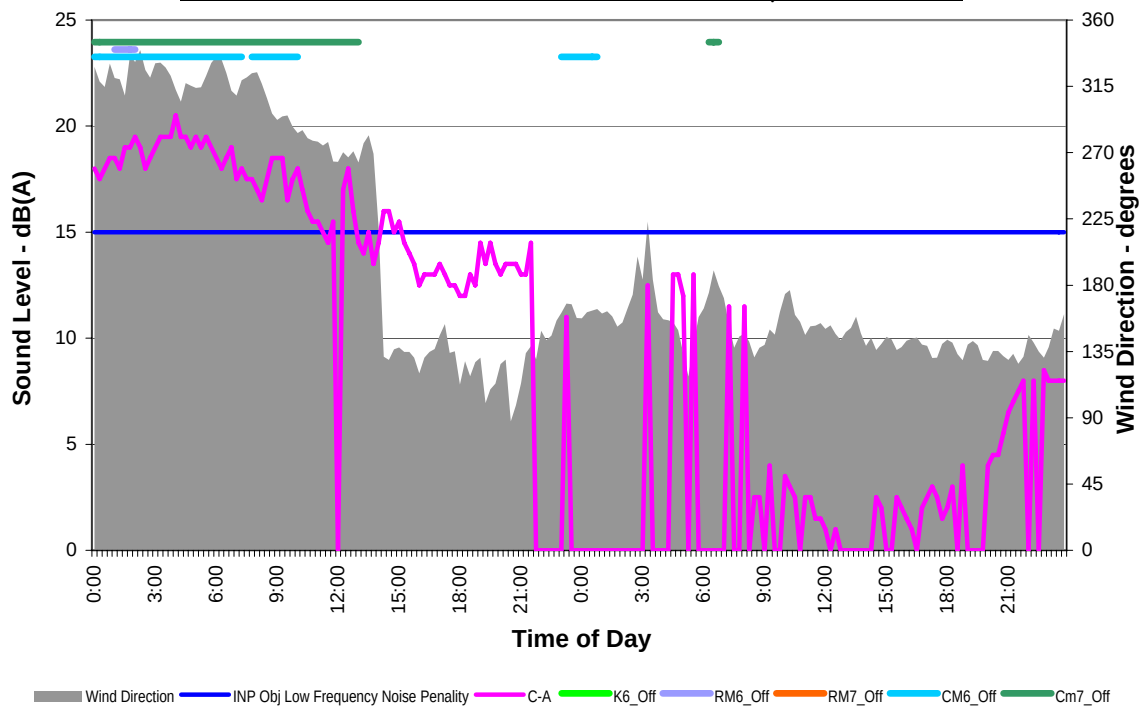
Berrima Cement Works - Ambient - Backaround Noise Survey

12 Brisbane St., New Berrima - 16 to 17 September 2019



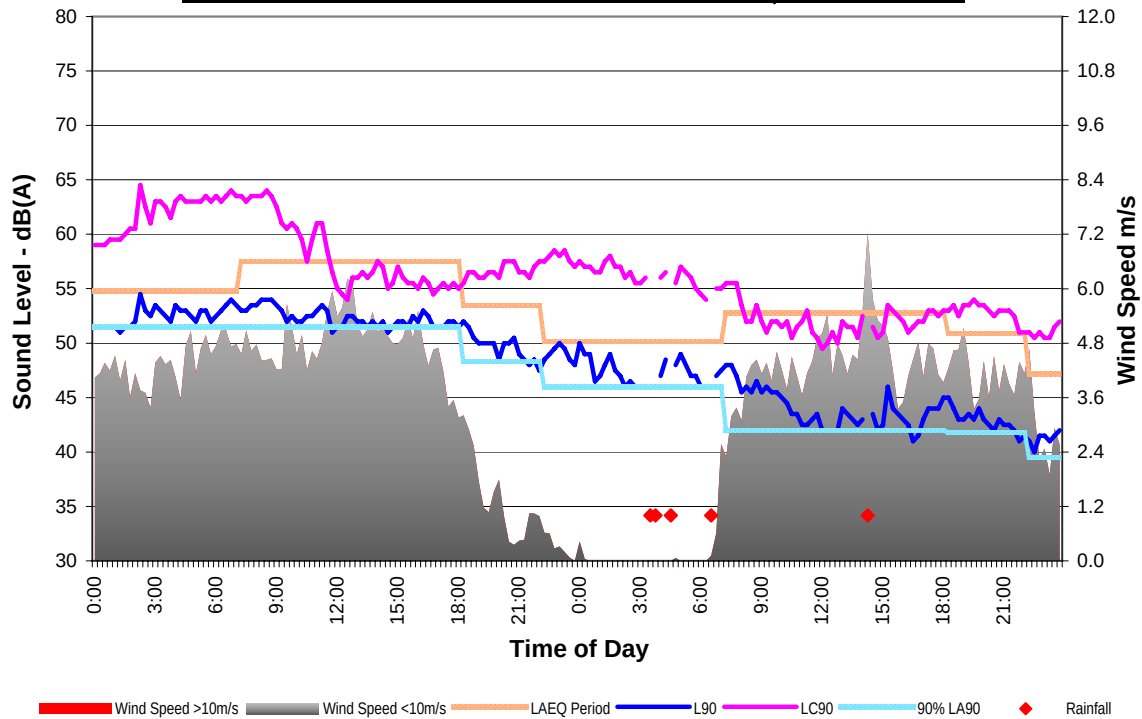
Berrima Cement Works - Ambient - Backaround Noise Survey

12 Brisbane St., New Berrima - 16 to 17 September 2019



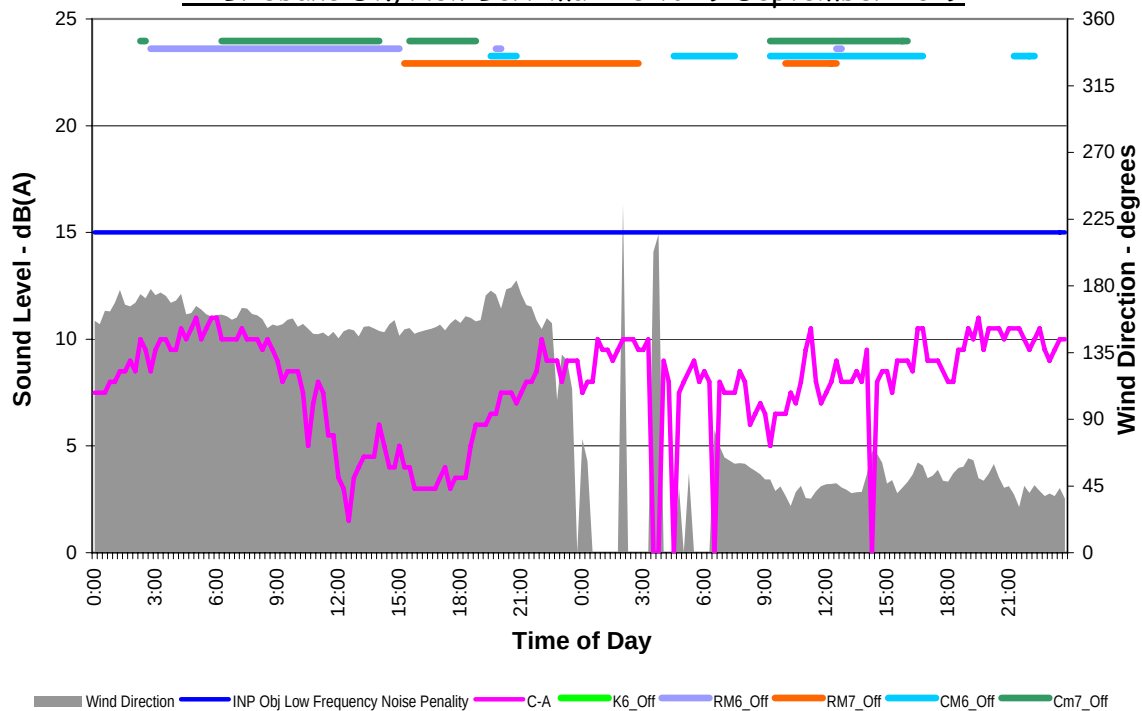
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 18 to 19 September 2019



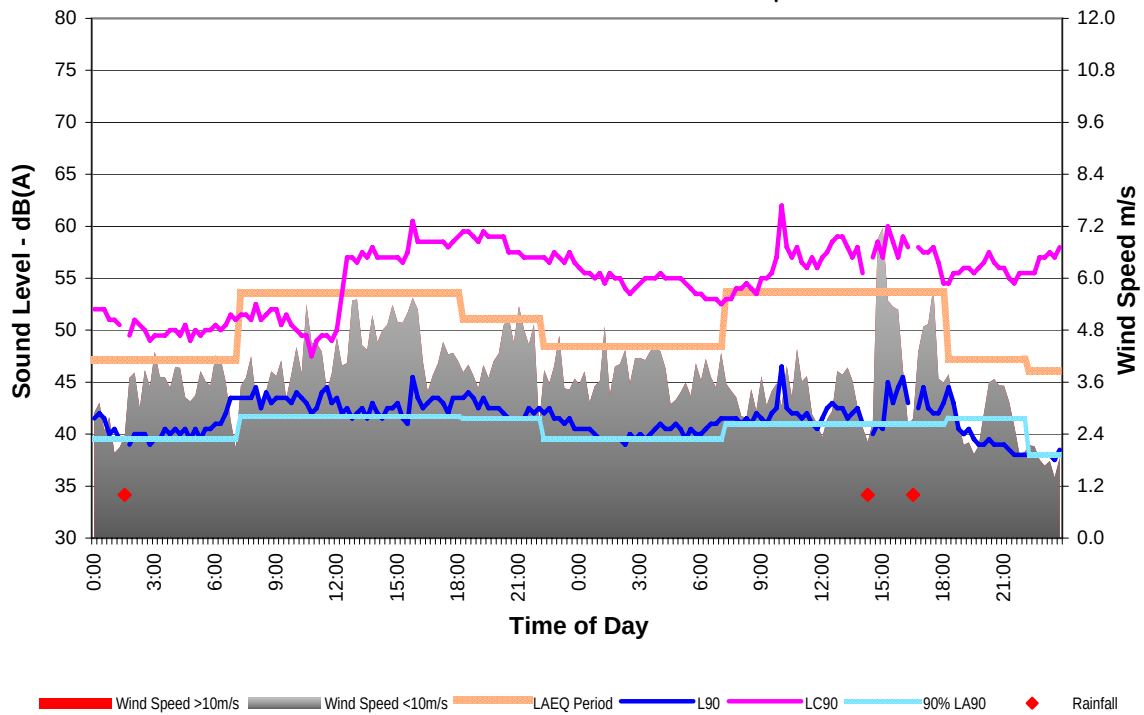
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 18 to 19 September 2019



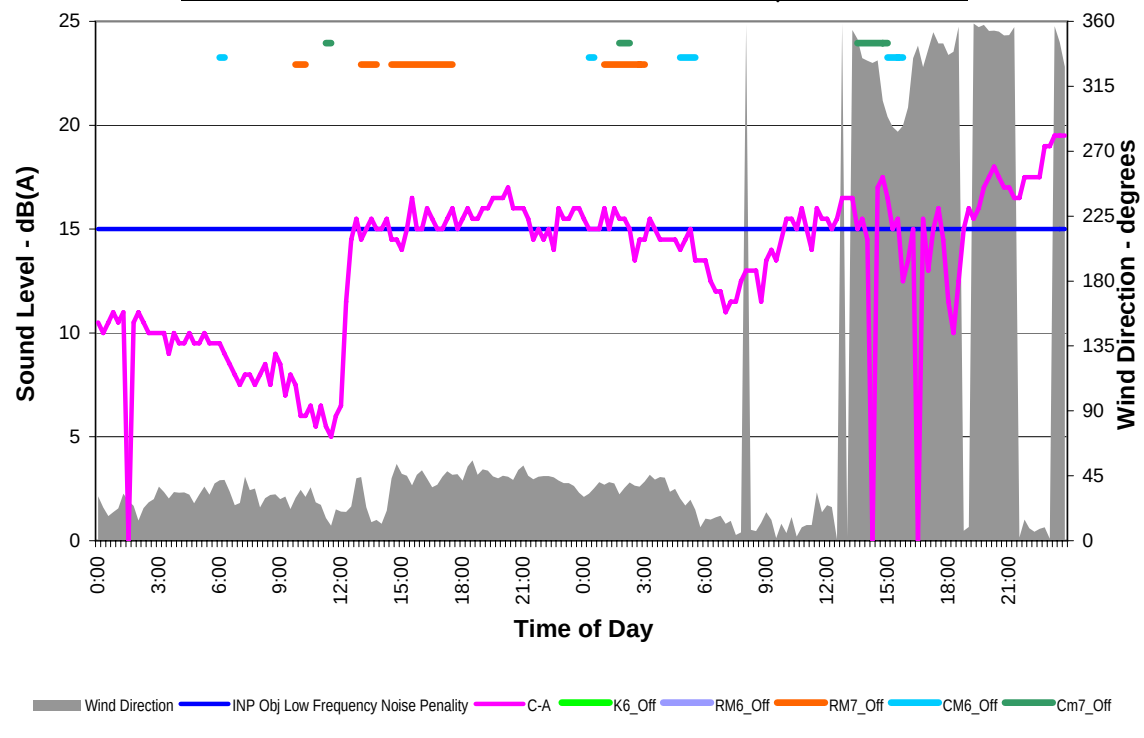
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 20 to 21 September 2019



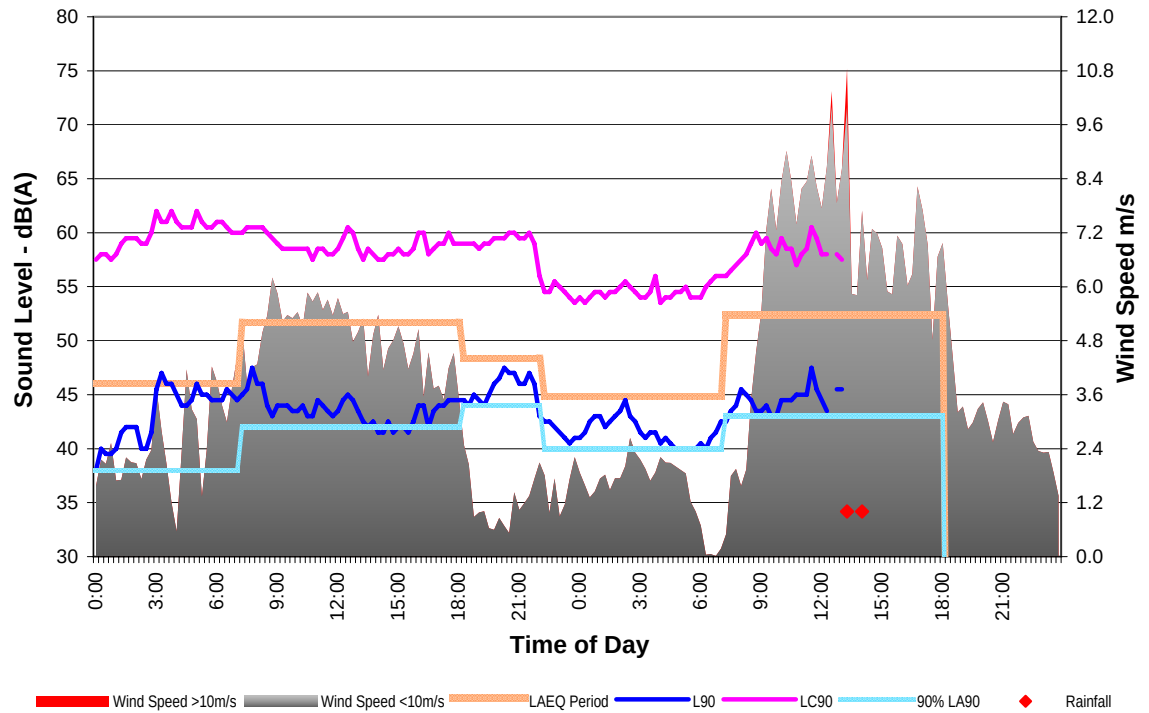
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 20 to 21 September 2019



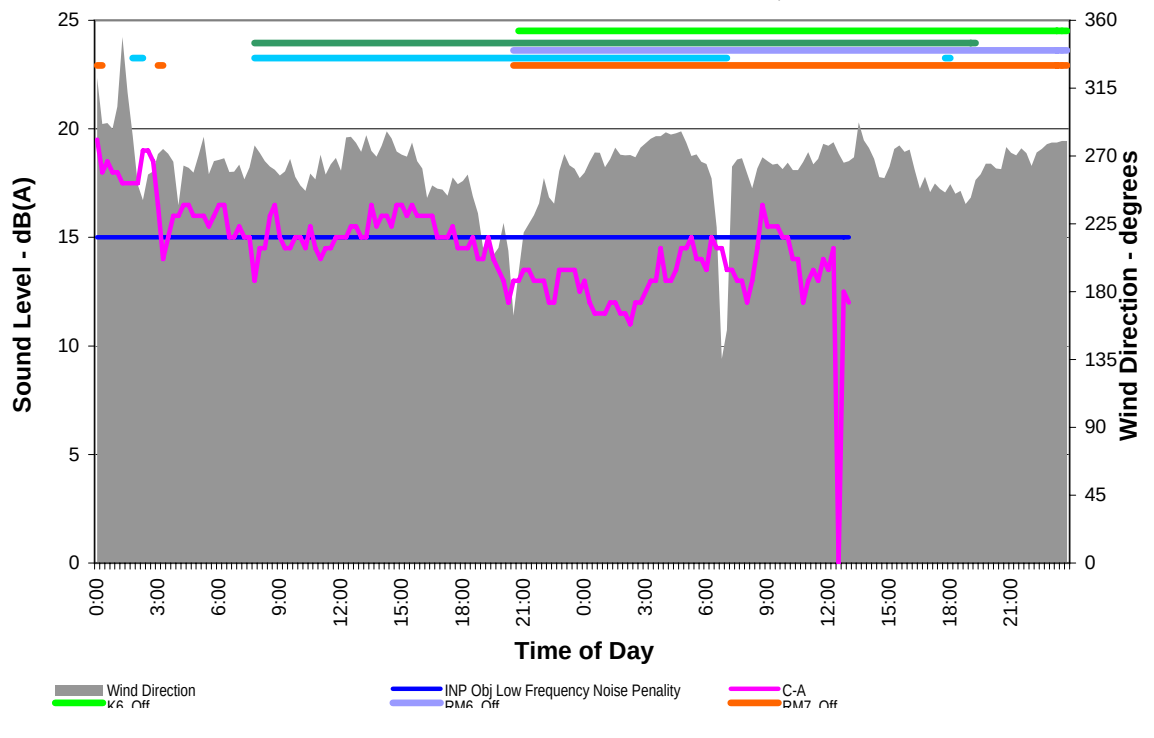
Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 22 to 23 September 2019



Berrima Cement Works - Ambient - Background Noise Survey

12 Brisbane St., New Berrima - 22 to 23 September 2019



Appendix E: Unattended environmental sound level results for 30 Adelaide Street

30 Adelaide St., New Berrima
Daytime LAEQ 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	Maximum	Minimum	Average	SD		
7:00		52	50	52	48	46	48		53	48	49	46	47	53	46	49	2.5		
7:15		49	53	51	48	44	44		52	50	45	46	48	53	44	49	3.0		
7:30		47	47	49	49	50	42		52	45	51	49	50	52	42	48	2.9		
7:45		49	47	49	52	48	41	51	46	43	47	45	52	41	47	3.3			
8:00		49	48	48	50	46	42	52	44	46	45	45	52	42	47	3.1			
8:15		47	47	48	49	47	54	51	46	57	44	46	57	44	49	3.9			
8:30		55	57	52	50	42	43	53	54	52	53	50	48	57	42	51	4.5		
8:45		62	50	52	48	46	52	51	52	48	52	48	47	62	46	50	4.0		
9:00		52	49	50	49	43	51	52	46	48	44	47	52	43	48	2.9			
9:15		52	51	46	48	41	51	51	55	48	51	44	48	55	41	49	3.8		
9:30		43	48	45	48	48	48		52	47	47	47	45	52	43	47	2.3		
9:45		45	49	52	47	44	47		53	57	46	44	48	57	44	48	4.2		
10:00		48	49	44	47	46	49		50	52	52	48	44	49	52	44	48	2.6	
10:15		48	54	45	49	45	52	51	53	50	49	47	49	54	45	49	2.8		
10:30		48	51	44	62	46	54	51	52	46	50	46	49	62	44	50	4.9		
10:45		45	51	47	51	44	49		52	46	50	46	45	52	44	48	2.8		
11:00		43	53	43	48	46	48		52	51	43	47	52	53	43	48	3.5		
11:15		50	45	52	46	46	50		54	51	52	44	48	48	49	54	44	49	3.0
11:30		50	50		43	47	48	53	53	51	48	50	48	53	43	49	3.0		
11:45		49	46		46	47	51	55	53	53	47	45	47	47	55	45	49	3.4	
12:00		51	51		43	51	44		51	52	47	47	44	46	52	43	48	3.4	
12:15		49	50	72	43	45	46		51	52	47	46	45	47	72	43	49	7.5	
12:30		48	50	70	42	49	46		49	52	52	48	47	42	45	70	42	49	7.0
12:45		48	46	52	46	48	47	49		53	48	45	48	46	53	45	48	2.5	
13:00		49	46	53	46	55	49	50		53	52	45	44	48	50	55	44	49	3.3
13:15		57	44	54	42	46	48	48			52	50	46	44	45	57	42	48	4.6
13:30		48	51	53	44	47	46	46	50		52	49	49	44	47	53	44	48	2.9
13:45		50	46	64	46	52	53	48			52	46	46	41	48	64	41	49	5.8
14:00		52	41	50	43	53	51	46		54	44	48	48	47	54	41	48	4.0	
14:15		48	57	49	43	51	48	49		60		46	45	45	60	43	50	5.1	
14:30		47	71	51	46	47	45	50	51	53		47	44	49	43	71	43	50	7.1
14:45		48	56	52	44	47	47	58	50	66		47	44	49	44	66	44	50	6.4
15:00		47	53	52	46	47	46	51		55	51	47	54	45	55	45	49	3.5	
15:15		51	49	48	58	46	46	53		58	46	51	50	44	58	44	50	4.6	
15:30		49	50	49	49	47	45	54		54	60	49	50	46	45	60	45	50	4.1
15:45		48	58	49	46	47	47	53	54	52	46	47	46	47	58	46	49	3.8	
16:00	47	49	51	48	55	48	52	53	53	47	47	49	48	55	47	50	2.8		
16:15	49	51	51	46	47	49	53	53	51	49	47	46	53	53	46	50	2.6		
16:30	47	50	51	48	49	53	51		51	46	43		47	53	43	49	2.8		
16:45	48	48	51	48	51	47	51		52	50	46		46	50	48	52	46	49	2.1
17:00	47	50	50	49	51	49	51		54	51	47		49	50	49	54	47	50	1.8
17:15	51	53	49	46	50	52	51	56	51	47	47	52	49	56	46	50	2.8		
17:30	57	51	59	49	51	47	52	52	52	44	45	53	51	59	44	51	4.2		
17:45	50	51	48	45	51	48	51	52	51	45	48	48	48	52	45	49	2.3		
18:00	50	51	51	47	54	48	48	52	50	44	46	49	46	54	44	49	2.7		
Max	57	71	72	58	62	53	58	56	66	57	57	54	53	72	53	60	6.5		
Min	47	41	47	42	45	41	41	50	50	43	43	41	43	50	41	44	3.3		
Ave	49	50	52	47	49	47	50	52	53	47	48	47	47	53	47	49	2.1		
SD	2.7	5.2	5.4	3.3	3.1	2.6	3.7	1.4	2.9	2.6	2.6	2.7	2.2	5.4	1.4	3.1	1.1		
E Ave	51	56	59	48	51	48	51	52	55	48	49	48	48	59	48	51	3.7		

Evening LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	Maximum	Minimum	Average	SD
18:00	50	51	51	47	54	48	48	52	50	44	46	49	46	54	44	49	2.7
18:15	52	50	47	52	47	45	51	52	52	54	49	48	48	54	45	50	2.7
18:30	50	45	46	46	49	43	48		51	43	48	49	47	51	43	47	2.7
18:45	48	44	47	47	47	42	49	51	49	42	44	48	46	51	42	46	2.7
19:00	48	44	45	43	47	43	49		49	43	42	49		49	42	46	2.9
19:15	47	44	45	45	45	40	47		50	41	48	46		50	40	45	2.9
19:30	47	45	47	43	45	41	48		50	43	44	44		50	41	45	2.6
19:45	46	48	47	42	46	45	48		50	47	43	40		50	40	46	3.0
20:00	46	43	46	44	47	43	49	51	49	40	43	48		51	40	46	3.2
20:15	46	48	47	42	45	44	48	50	49	45	43	46		50	42	46	2.5
20:30	46	41	47	43	42	42	45	52	47	42	45	43		52	41	44	3.0
20:45	47	44	48	43	43	46	48	49	47	40	45	43		49	40	45	2.7
21:00	47	42	47	43	45	40	49	50	48	43	44	41		50	40	45	3.2
21:15	46	42	49	45	42	40	50	49	48	46	47	47		50	40	46	3.2
21:30	47	42	47	45	42	39	49	49	48	40	46	43		49	39	45	3.5
21:45	48	41	48	46	43	39		49	49	42	42	44		49	39	45	3.6
22:00	50	43	49	45	40	39		49	49	42	42	41		50	39	44	4.0
Max	52	51	51	52	54	48	51	52	52	54	49	49	48	54	48	51	2.1
Min	46	41	45	42	40	39	45	49	47	40	42	40	46	49	39	43	3.2
Ave	48	45	47	45	45	42	48	50	49	43	45	45	47	50	42	46	2.4
SD	1.8	3.0	1.5	2.5	3.3	2.7	1.4	1.4	1.3	3.4	2.2	2.9	0.6	3.4	0.6	2.1	0.9
E Avg	48	46	47	46	47	43	49	50	49	45	45	46	47	50	43	47	2.0

Night LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	Maximum	Minimum	Average	SD
22:00	50	43	49	45	40	39			49	42	42	41		50	39	44	4.0
22:15	48	41	49	46	46	39		51	48	43	41	38		51	38	44	4.3
22:30	48	42	44	45	40	41			48	42	41	37		48	37	43	3.7
22:45	48	44	43	45	39	38		50	47	40	40	37		50	37	43	4.2
23:00	51	42	42	45	38	37		49	48	41	41	38		51	37	43	4.8
23:15	52	44	44	46	40	37	53	50	48	40	42	39		53	37	44	5.3
23:30	50	42	46	45	41	37		50	48	42	41	40		50	37	44	4.2
23:45	46	43	45	45	41	41		49	45	41	40	40		49	40	43	3.0
0:00	42	42	48	45	42	37		50	44	40	39	40		50	37	43	3.9
0:15	43	42	48	45	42	38		50	46	39	40	42		50	38	43	3.6
0:30	45	41	50	46	43	36		49	48	39	39	41		50	36	43	4.5
0:45	45	41	49	46	43	36		49	48	38	42	42		49	36	44	4.3
1:00	44	43	48	46	43	37		50	46	39	40	41		50	37	43	3.9
1:15	46	42	48	46	44	35		52	46	39	39	39		52	35	43	4.8
1:30	47	41	48	45	44	37		50	46		41	38		50	37	44	4.4
1:45	47	42	49	45	44	37		50	45	39	41	41		50	37	43	4.1
2:00	46	42	51	45	43	37		50	45	39	40	47		51	37	44	4.5

30 Adelaide St., New Berrima
Daytime LA90 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	Maximum	Minimum	Average	SD
7:00		49	45	47	46	42	37		49	42	41	40	45	49	37	44	3.9
7:15		47	44	46	47	41	37	49	50	42	41	39	45	50	37	44	4.0
7:30		43	45	47	46	40	37		50	41	41	40	44	50	37	43	3.8
7:45		42	45	47	46	40	37		50	41	40	40	42	50	37	43	3.8
8:00		43	45	46	46	40	37	50	49	41	41	40	43	50	37	43	3.9
8:15		43	44	44	46	40	37		49	41	41	39	43	49	37	43	3.3
8:30		44	44	44	46	40	38	49	50	41	48	40	44	50	38	44	3.7
8:45		41	44	46	45	39	39	48	49	41	42	40	44	49	39	43	3.3
9:00		40	46	45	46	38	41		49	41	42	40	44	49	38	43	3.3
9:15		42	45	42	45	39	40	49	48	41	42	40	44	49	39	43	3.2
9:30		38	43	41	44	40	42		49	41	41	40	42	49	38	42	2.8
9:45		40	45	41	45	42	41		49	41	41	40	44	49	40	43	2.8
10:00		41	46	40	45	42	43	48	49	41	42	40	43	49	40	43	3.0
10:15		43	50	40	45	42	44	49	50	40	43	40	44	50	40	44	3.7
10:30		41	48	39	45	41	43	49	49	40	44	39	44	49	39	44	3.6
10:45		40	46	40	44	42	44		48	40	43	40	43	48	40	43	2.8
11:00		40	48	38	44	42	43	49	48	39	43	39	44	49	38	43	3.7
11:15		41	48		39	43	42	42	49	39	42	42	44	49	39	43	3.5
11:30		44		40	44	41	41	50	49	40	41	41	45	50	40	43	3.4
11:45		40		40	44	43	44	49	48	40	40	41	43	49	40	43	3.4
12:00		43		39	44	40		49	49	42	41	40	42	49	39	43	3.5
12:15		43	51	39	43	39	46		49	41	41	40	43	51	39	43	4.0
12:30		43	54	39	44	40	44	50	49	40	40	40	42	54	39	44	4.8
12:45	46	41	48	39	43	39	46		49	41	41	39	42	49	39	43	3.6
13:00	46	40	49	39	44	40	44	49	48	39	41	40	40	49	39	43	4.1
13:15	46	41	49	39	41	41	44		49	39	41	40	41	49	39	42	3.6
13:30	46	43	49	38	42	41	42	48	48	40	41	38	41	49	38	43	3.8
13:45	47	39	48	38	43	42	44		49	40	41	37	42	49	37	42	3.8
14:00	46	39	47	40	43	43	43		49	40	42	39	42	49	39	42	3.3
14:15	45	41	45	39	44	43	46		49		42		41	49	39	43	3.1
14:30	45	45	47	41	44	43	48	49	49	41	40	42	40	49	40	44	3.3
14:45	45	44	48	40	42	43	48	48	50	41	41	43	42	50	40	44	3.4
15:00	45	43	47	42	44	43	49		50	41	41	45	42	50	41	44	2.9
15:15	45	42	45	42	44	43	50		50	41	41	43	42	50	41	44	3.3
15:30	45	41	46	43	43	43	49	51	50	40	41	43	41	51	40	44	3.9
15:45	45	44	45	43	43	43	49	51	49	39	41	43	42	51	39	44	3.5
16:00	44	40	47	43	44	45	49	50	49	40	41	43	43	50	40	44	3.5
16:15	45	39	46	43	43	44	48	49	48	41	39	41	45	49	39	44	3.4
16:30	43	41	45	43	44	43	48		48	41	40		44	48	40	44	2.8
16:45	43	39	47	43	42	44	49	50	48	41	40	41	44	50	39	44	3.6
17:00	45	40	45	42	41	44	48	50	48	41	41	45	44	50	40	44	3.3
17:15	46	40	45	43	42	43	48	50	48	42	40	47	45	50	40	44	3.2
17:30	46	42	45	42	43	43	49	50	48	41	41	48	46	50	41	45	3.3
17:45	47	42	43	40	42	43	49	50	47	40	41	43	46	50	40	44	3.2
18:00	47	42	43	41	44	42	45	50	47	39	40	43	45	50	39	43	3.0
Max	47	49	54	47	47	45	50	51	50	42	48	48	46	54	42	48	3.0
Min	43	38	43	38	41	38	37	48	47	39	39	37	40	48	37	41	3.6
Ave	45	42	46	42	44	42	44	49	49	41	41	41	43	49	41	44	2.9
SD	1.1	2.1	2.2	2.6	1.4	1.6	4.1	0.8	0.7	0.8	1.4	2.3	1.4	4.1	0.7	1.7	0.9
90%	44	39	44	39	42	39	37	48	48	39	40	39	41	48	37	42	3.5
															Median	40	

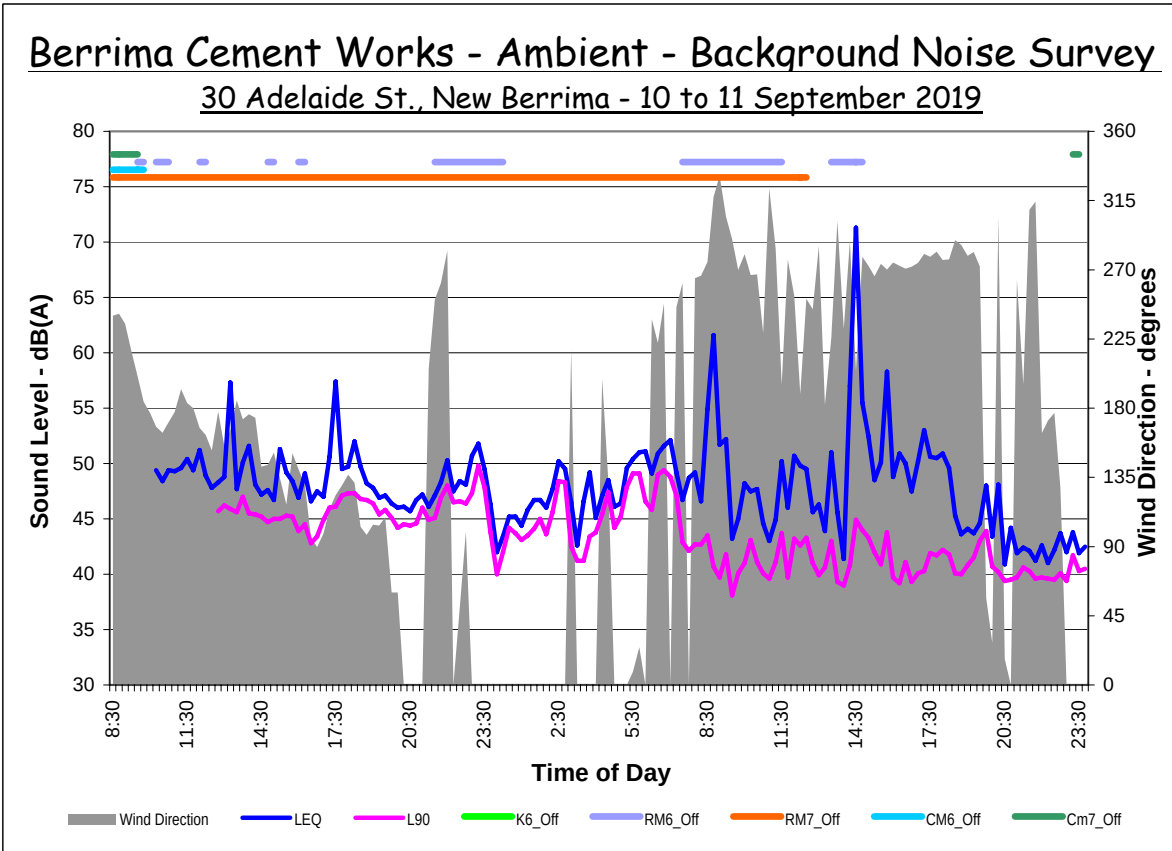
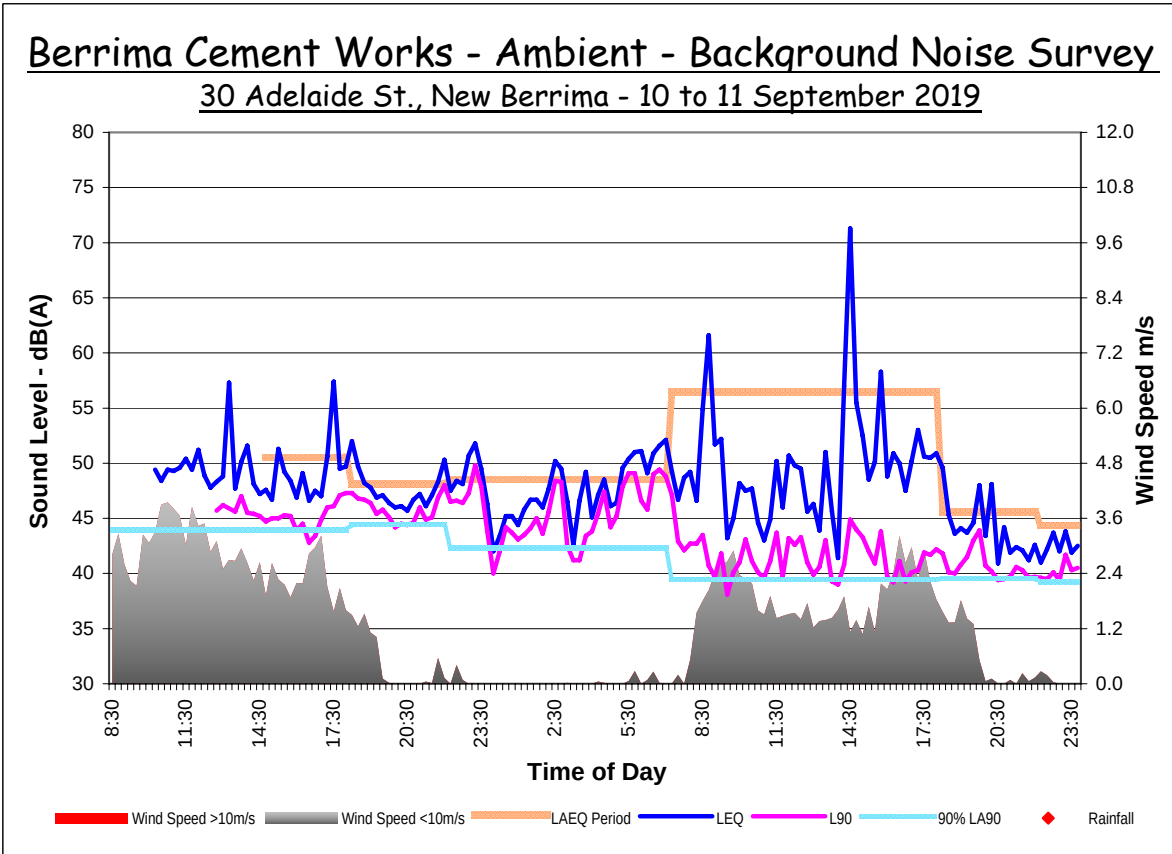
Evening LA90

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	Maximum	Minimum	Average	SD
18:00	47	42	43	41	44	42	45	50	47	39	40	43	45	50	39	43	3.0
18:15	47	42	43	43	45	41	47	50	47	39	41	43	44	50	39	44	2.9
18:30	47	40	43	42	44	40	45		47	40	40	42	45	47	40	43	2.5
18:45	47	40	43	41	44	40	46	48	47	40	39	40	45	48	39	43	3.1
19:00	46	41	43	42	43	40	47		48	39	38	42		48	38	42	3.1
19:15	45	42	43	43	43	38	44		48	39	39	41		48	38	42	2.9
19:30	46	43	43	41	43	38	46		47	39	39	39		47	38	42	3.1
19:45	45	44	45	41	44	38	46		48	38	39	38		48	38	42	3.7
20:00	44	41	44	42	44	38	47	49	47	38	40	38		49	38	43	3.9
20:15	45	40	45	40	43	39	46	48	47	38	39	39		48	38	42	3.7
20:30	44	39	46	39	40	38	42	47	46	39	41	39		47	38	41	3.3
20:45	45	40	45	41	40	38	46	47	46	38	40	38		47	38	42	3.4
21:00	46	40	45	40	38	38	47	47	46	39	40	37		47	37	42	4.0
21:15	45	41	46	41	38	38	47	47	47	38	41	37		47	37	42	4.1
21:30	45	40	45	43	36	36	47	47	47	38	41	37		47	36	42	4.5
21:45	47	40	45	44	39	36		47	48	39	39	36		48	36	41	4.4
22:00	48	40	47	44	37	35			47	39	38	36		47	35	40	4.4
Max	48	44	47	44	45	42	47	50	48	40	41	43	45	50	40	45	2.9
Min	44	39	43	39	36	35	42	47	46	38	38	36	44	47	35	41	3.9
Ave	46	41	44	42	41	38	46	48	47	39	40	39	44	48	38	43	3.3
SD	1.2	1.3	1.3	1.4	3.1	1.9	1.4	1.1	0.5	0.6	0.8	2.3	0.4	3.1	0.4	1.3	0.7
90%	44	40	43	40	37	36	44	47	46	38	39	37	44	47	36	41	3.8
															Median	40	

Night LA90

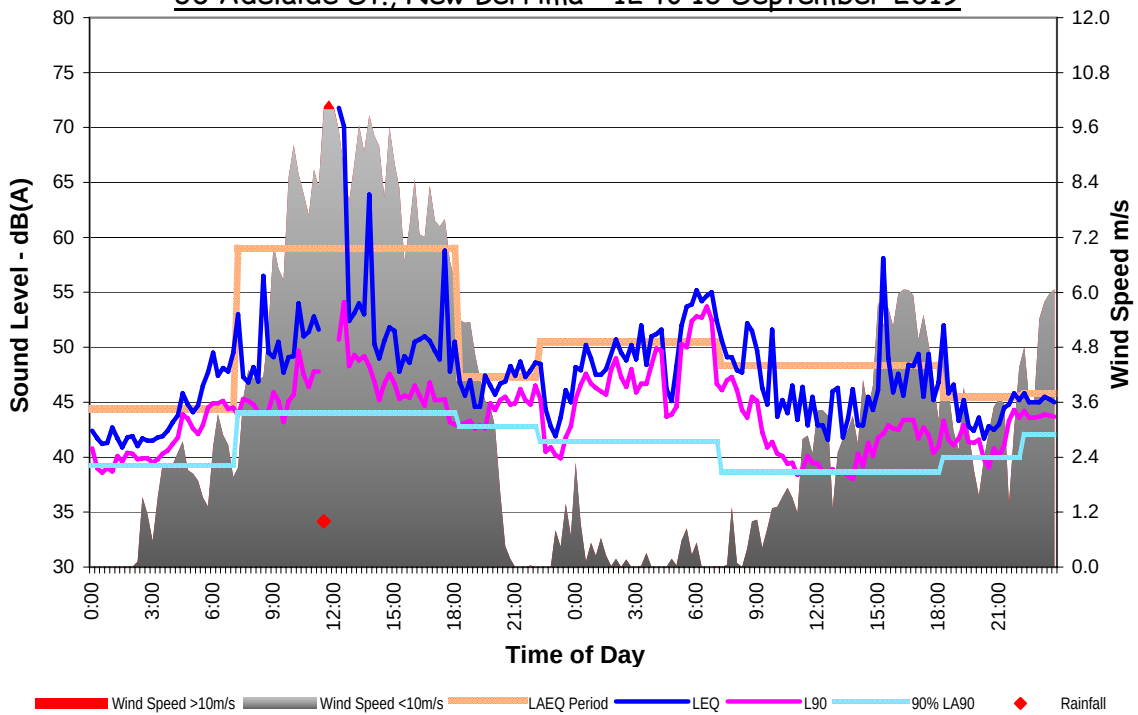
Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	Maximum	Minimum	Average	SD
22:00	48	40	47	44	37	35			47	39	38	36		47	35	40	4.4
22:15	47	40	45	44	39	37		48	47	38	38	36		48	36	41	4.5
22:30	47	40	41	44	35	38			46	38	38	35		46	35	39	3.6
22:45	46	40	41	44	36	37		48	45	38	37	35		48	35	40	4.3
23:00	47	39	40	44	36	35		47	47	38	37	36		47	35	40	4.5
23:15	50	42	40	44	37	35	50	48	47	38	38	37		50	35	41	5.0
23:30	48	40	42	44	39	36		48	47	37	38	37		48	36	41	4.3
23:45	44	41	43	44	40	36		48	43	37	38	37		48	36	40	3.8
0:00	40	41	45	43	41	35		48	43	38	37	38		48	35	41	4.1
0:15	42	39	47	44	41	35		48	44	37	37	40		48	35	41	4.3
0:30	44	39	48	44	42	34		47	45	37	37	40		48	34	41	4.6
0:45	44	39	47	44	42	35		47	47	36	37	40		47	35	41	4.7
1:00	43	39	46	45	42	34		47	44	36	37	40		47	34	41	4.5
1:15	44	40	46	44	42	34		50	45	37	36	37		50	34	41	5.1
1:30	44	40	46	44	43	36		48	44		38	37		48	36	42	4.3
1:45	45	40	48	43	42	36		48	44	36	37	39		48	36	41	4.5
2:00	44	40	49	44	42	35		48	43	37	37	43		49	35	42	4.7
2:15	46	40	47	43	41	33		49	45	37	37	46		49	33	42	5.1
2:30	48	40	46	43	41	34		48	45	38	37	46		48	34	42	4.7
2:45	48	40	48	43	41	33		48	46	37	38	45		48	33	42	4.9
3:00	43	40	46	42	41	33		49	46	37	39	45		49	33	42	5.0
3:15	41	40	47	42	42	34	47	49	46	37	38	44		49	34	42	4.7
3:30	41	40	47	41	41	33		49		37	38	43		49	33	41	4.8
3:45	43	41	48	40	40	34		48		37	38	43		48	34	41	4.8
4:00	44	41	50	41	39	34		48	47	37	38	45		50	34	42	5.2
4:15	45	42	50	43	41	35		48	46	38	37	45		50	35	42	4.9
4:30	47	44	44	44	42	34	47	47		38	38	45		47	34	42	4.5
4:45	44	44	44	44	41	35	47	48	44	38	38	45		48	35	43	3.9
5:00	45	43	45	45	41	36	47	48	43	39	39	43		48	36	42	3.7
5:15	48	42	50	45	41	35		49	42	39	39	43		50	35	42	4.5
5:30	49	43	50	45	41	35	48	49	43	40	39	44		50	35	43	4.5
5:45	49	45	52	45	41	35		49	44	40	40	44		52	35	44	4.8
6:00	47	45	53	46	43	36		48	45	40	40	43		53	36	44	4.8
6:15	46	45	53	46	43	36		48	45	40	40	44		53	36	44	4.7
6:30	49	45	54	47	43	36		49		40	40	45		54	36	44	5.2
6:45	49	44	53	46	42	36		49	43	41	39	46		53	36	44	4.9
7:00	49	45	47	46	42	37		49	42	41	40	45		49	37	43	3.7
Max	50	45	54	47	43	38	50	50	47	41	40	46		54	38	46	4.6
Min	40	39	40	40	35	33	47	47	42	36	36	35		47	33	39	4.4
Ave	46	41	47	44	41	35	47	48	45	38	38	41		48	35	43	4.2
SD	2.6	2.0	3.6	1.4	2.1	1.2	1.1	0.8	1.5	1.4	1.1	3.7		3.7	0.8	1.9	1.0
90%	42	39	41	42	37	33	47	47	43	37	37	36		47	33	40	4.3
															Median	40	

Two Day Results of Ambient Noise Monitoring



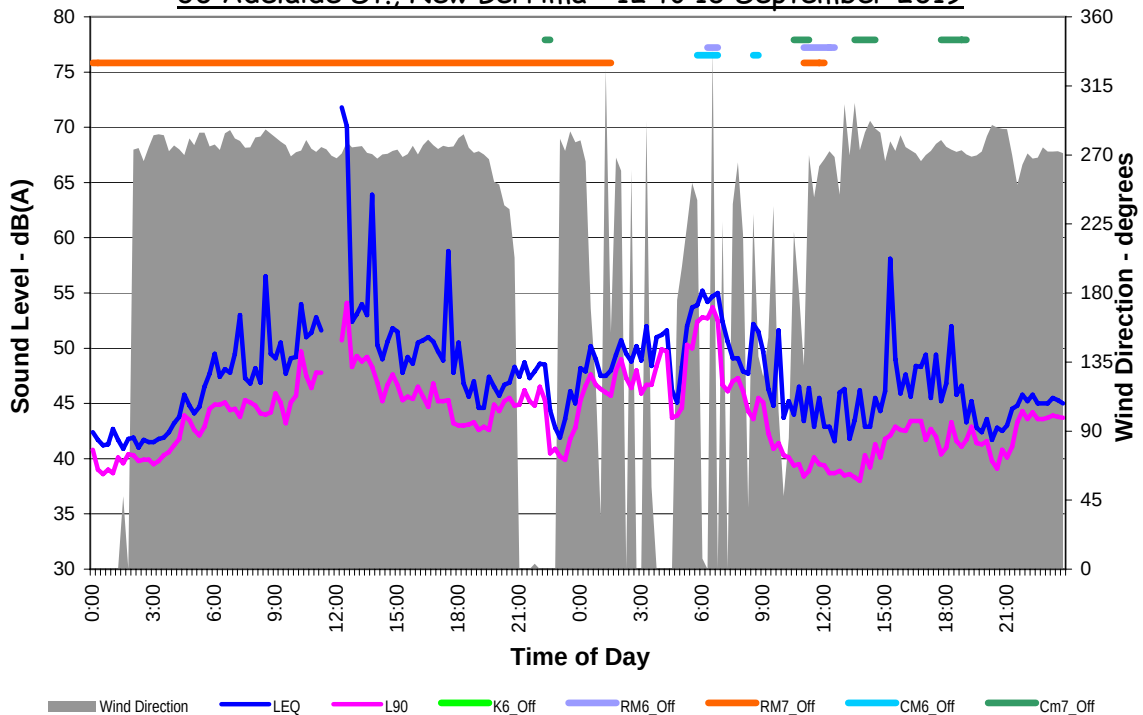
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 12 to 13 September 2019



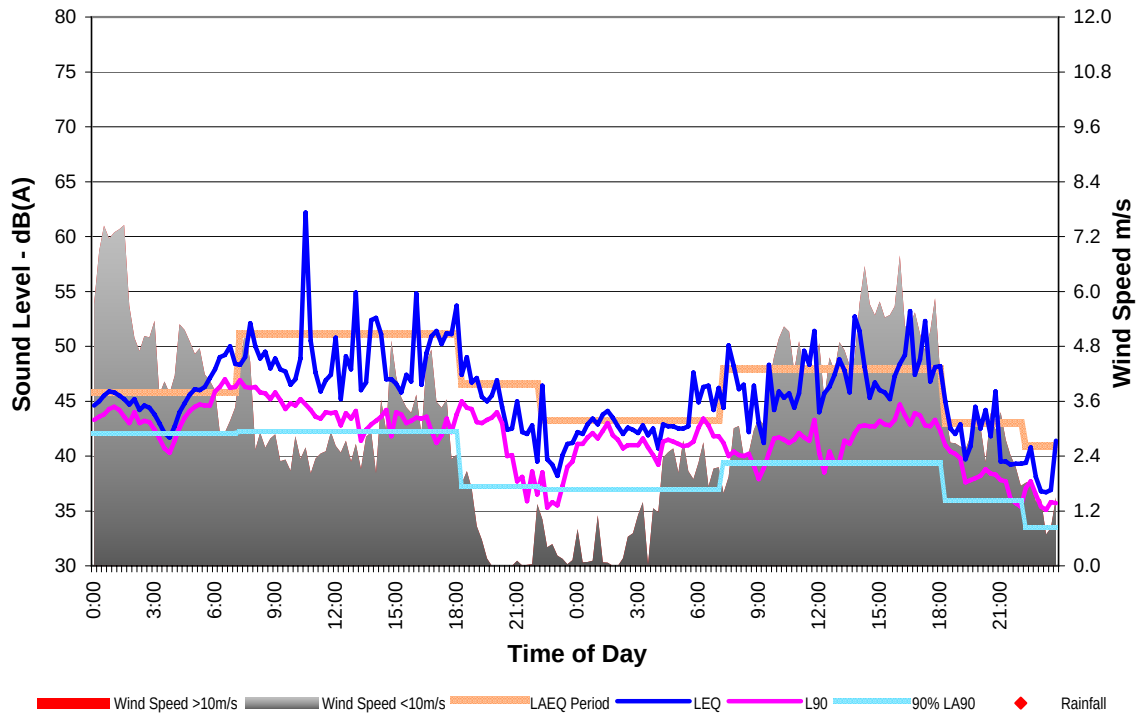
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 12 to 13 September 2019



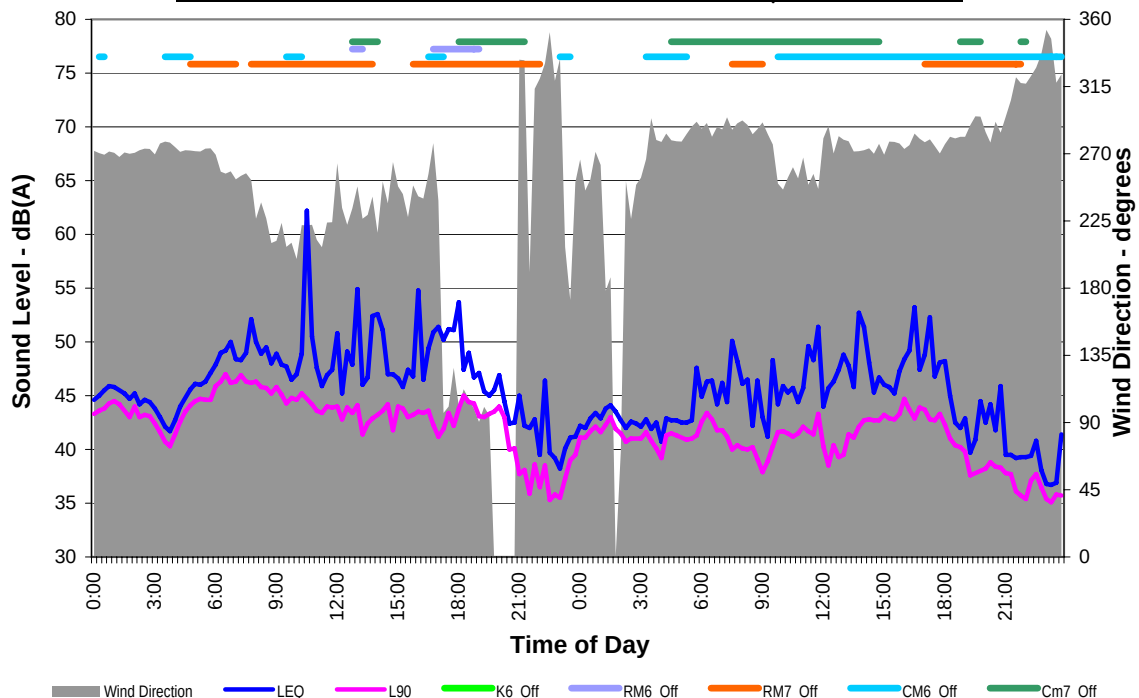
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 14 to 15 September 2019



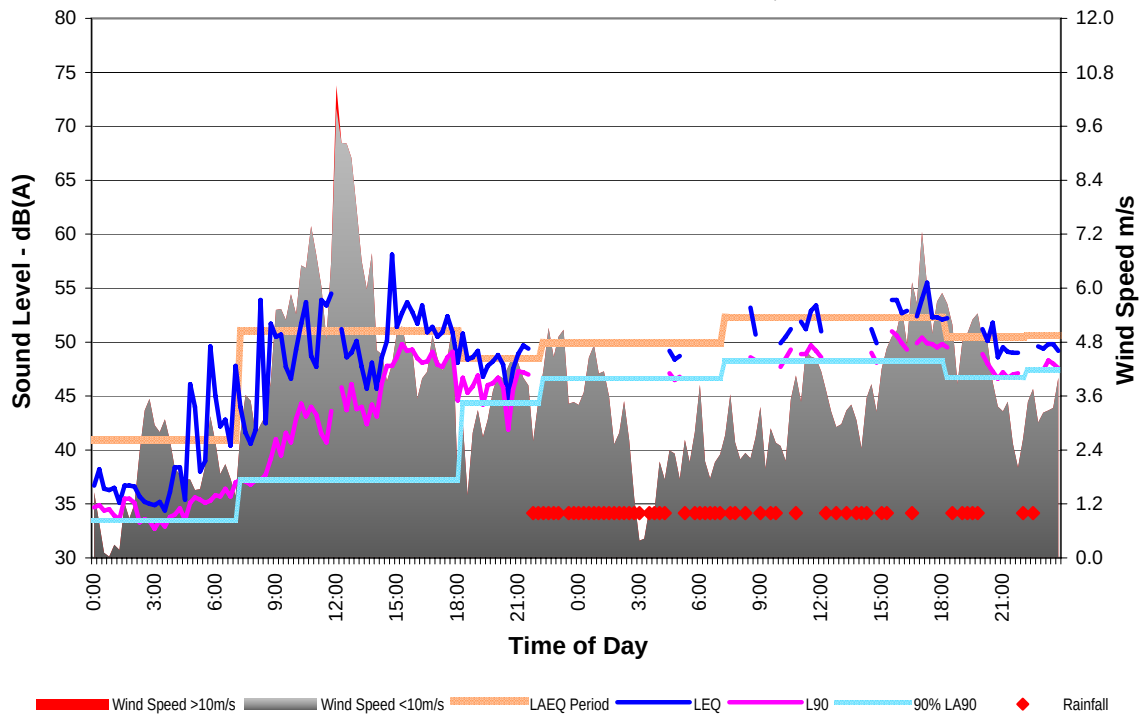
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 14 to 15 September 2019



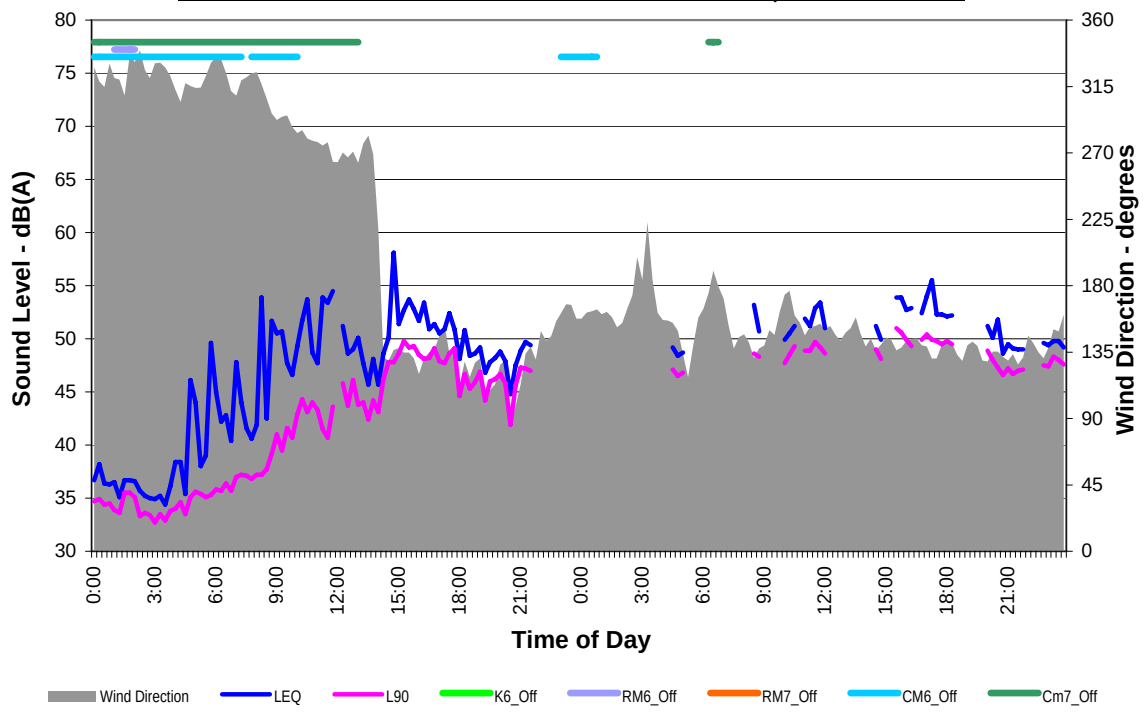
Berrima Cement Works - Ambient - Backaround Noise Survey

30 Adelaide St., New Berrima - 16 to 17 September 2019



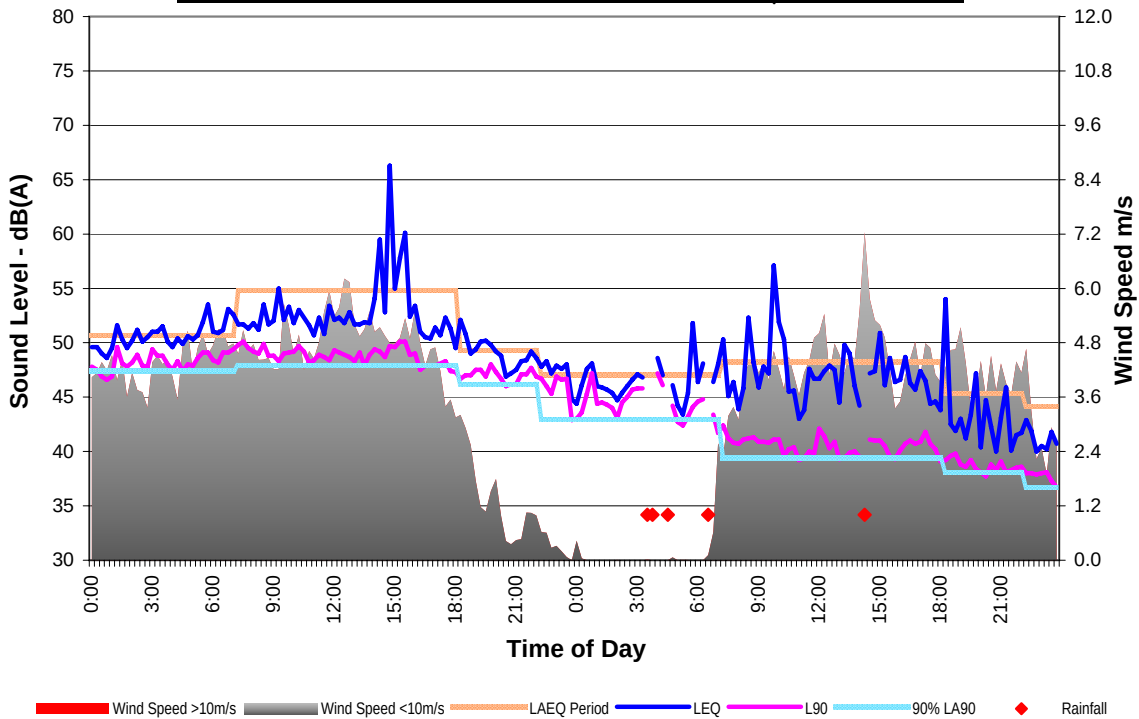
Berrima Cement Works - Ambient - Backaround Noise Survey

30 Adelaide St., New Berrima - 16 to 17 September 2019



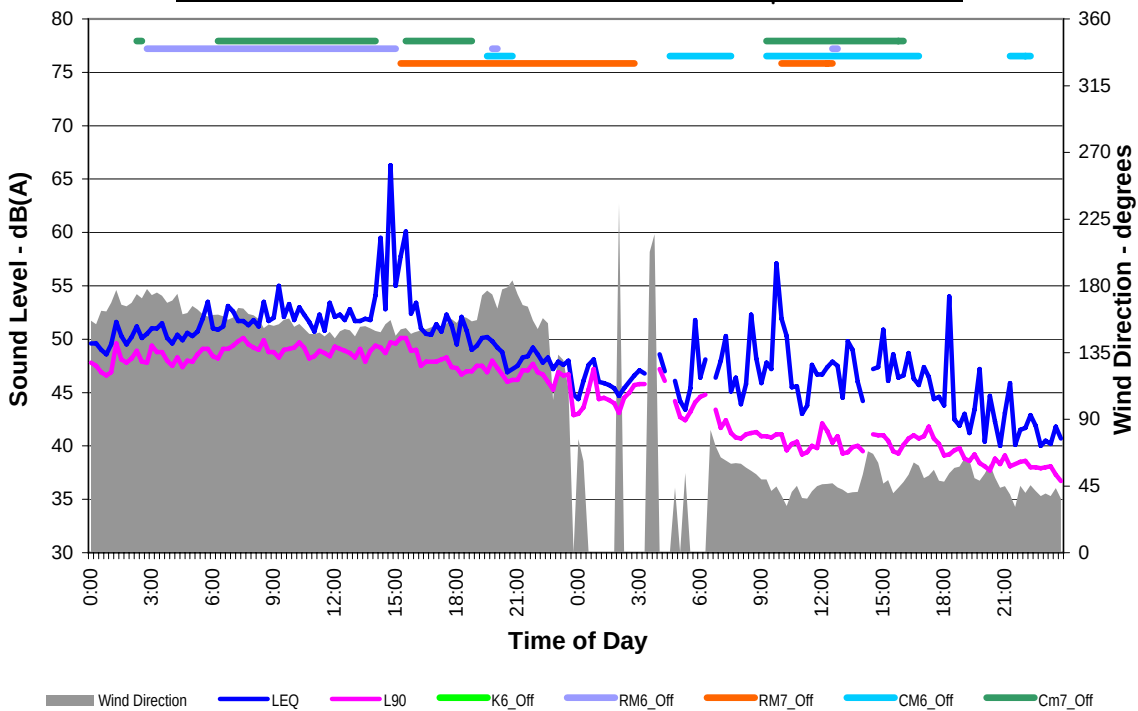
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 18 to 19 September 2019



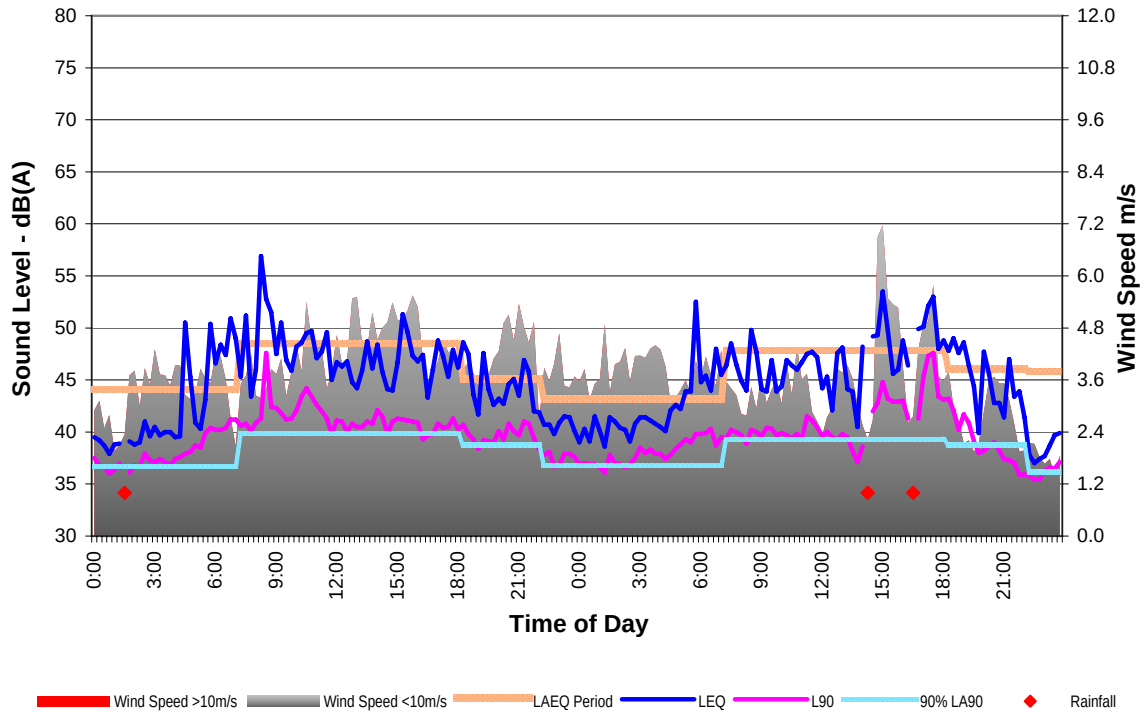
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 18 to 19 September 2019



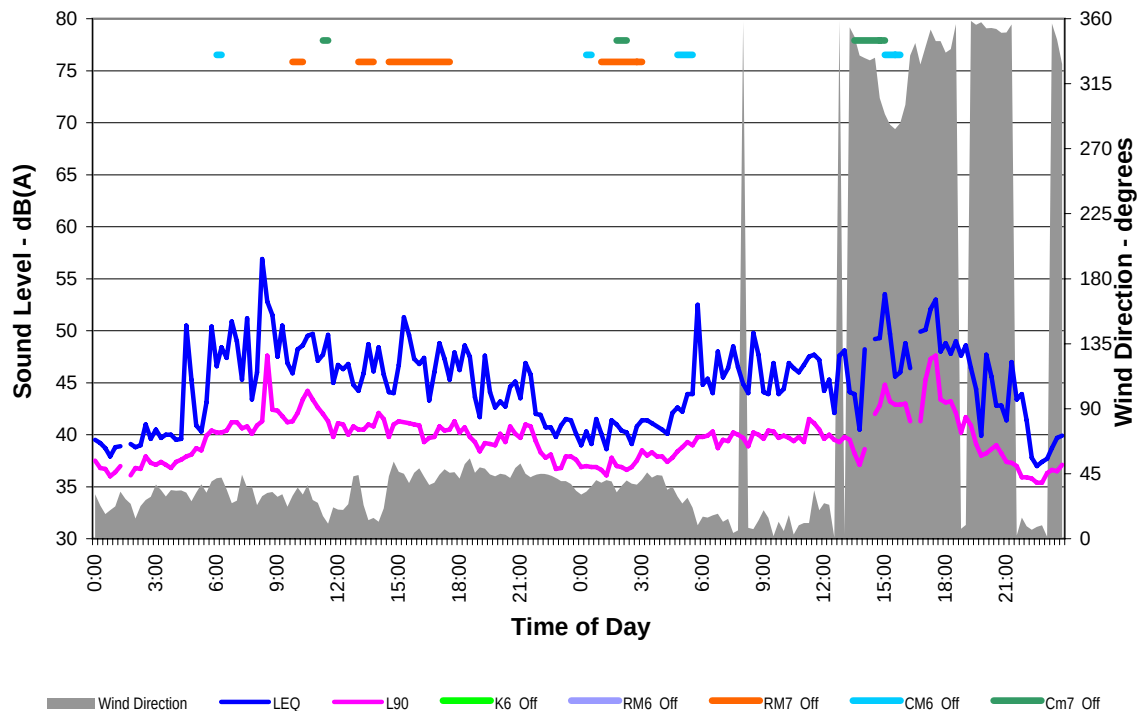
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 20 to 21 September 2019



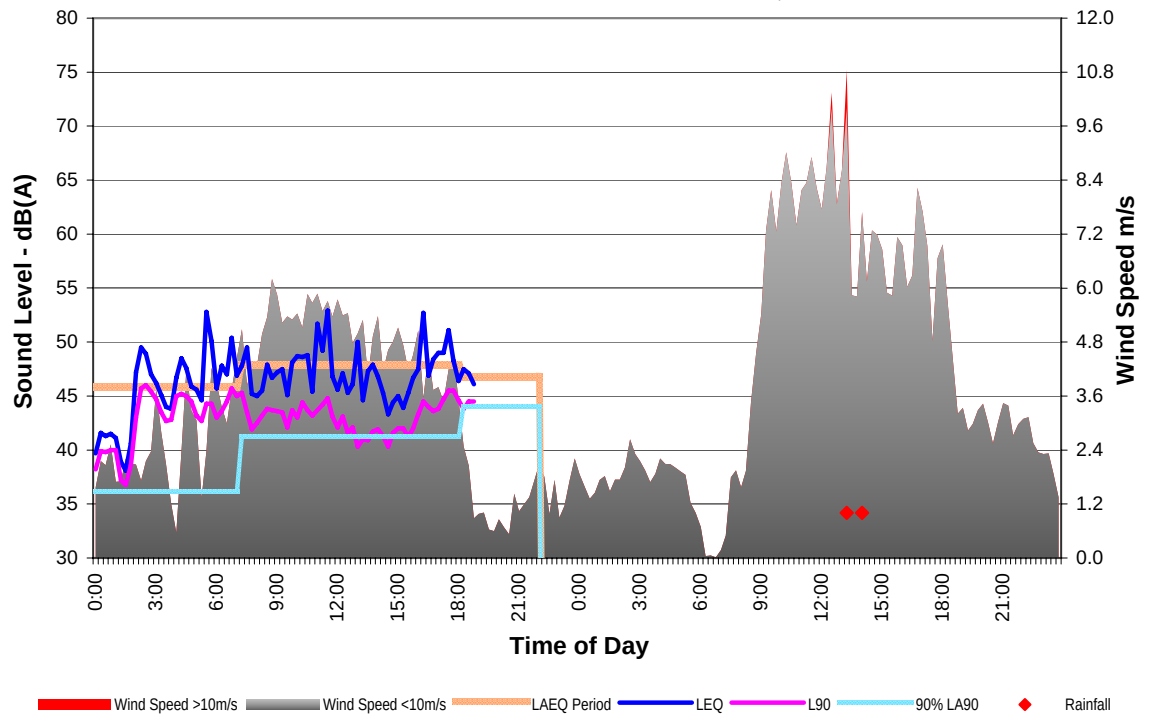
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 20 to 21 September 2019



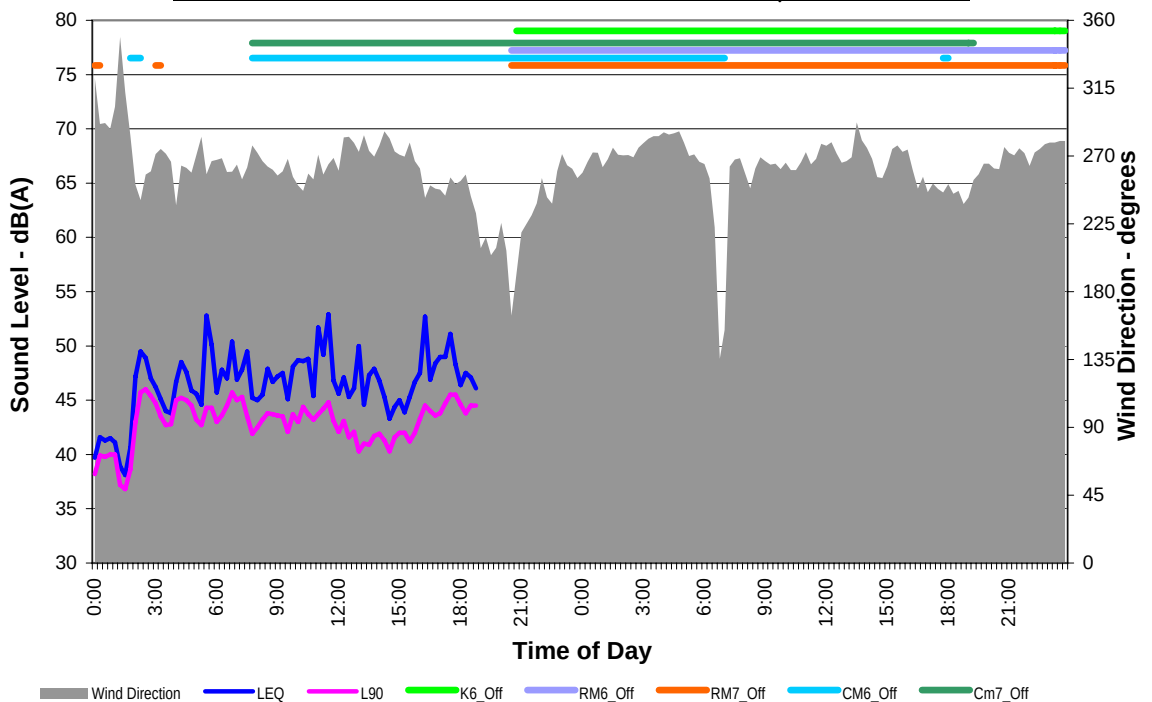
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 22 to 23 September 2019



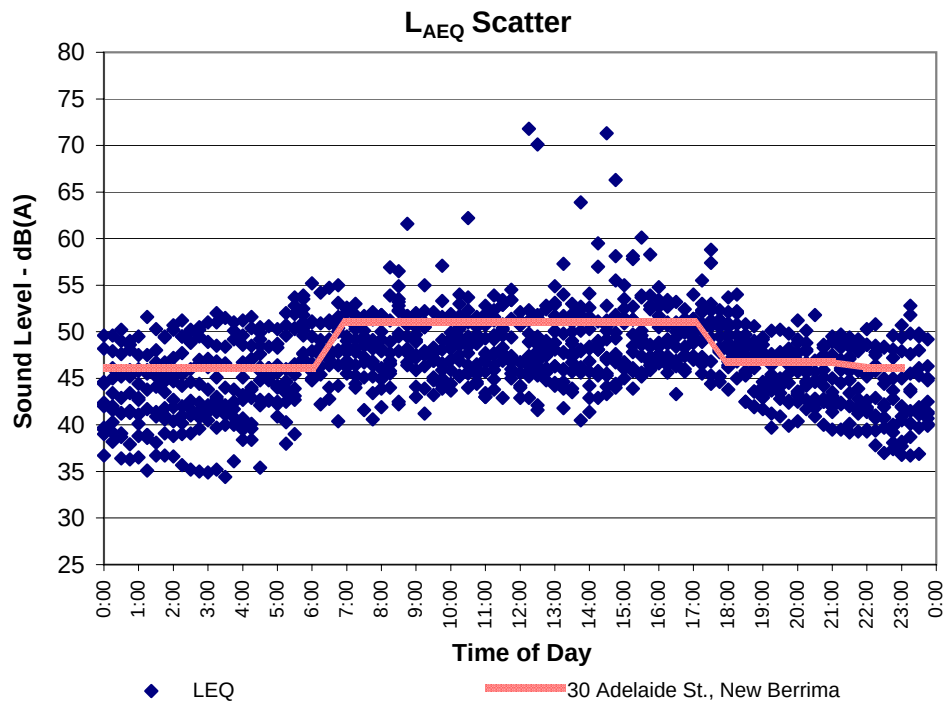
Berrima Cement Works - Ambient - Background Noise Survey

30 Adelaide St., New Berrima - 22 to 23 September 2019



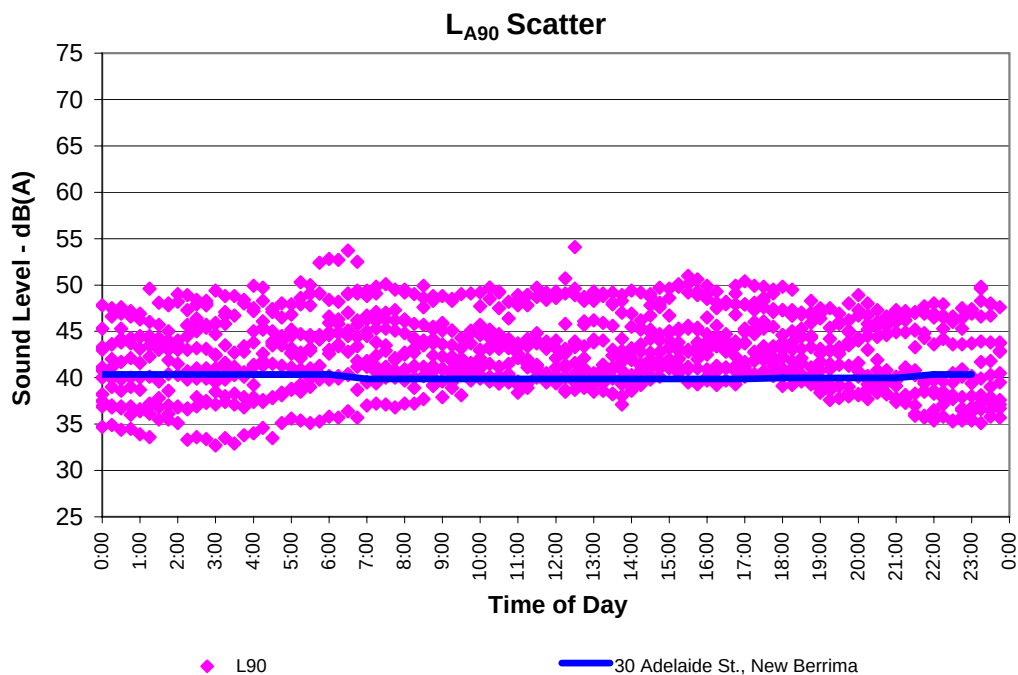
Berrima Cement Works - Ambient - Background Noise

30 Adelaide St., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

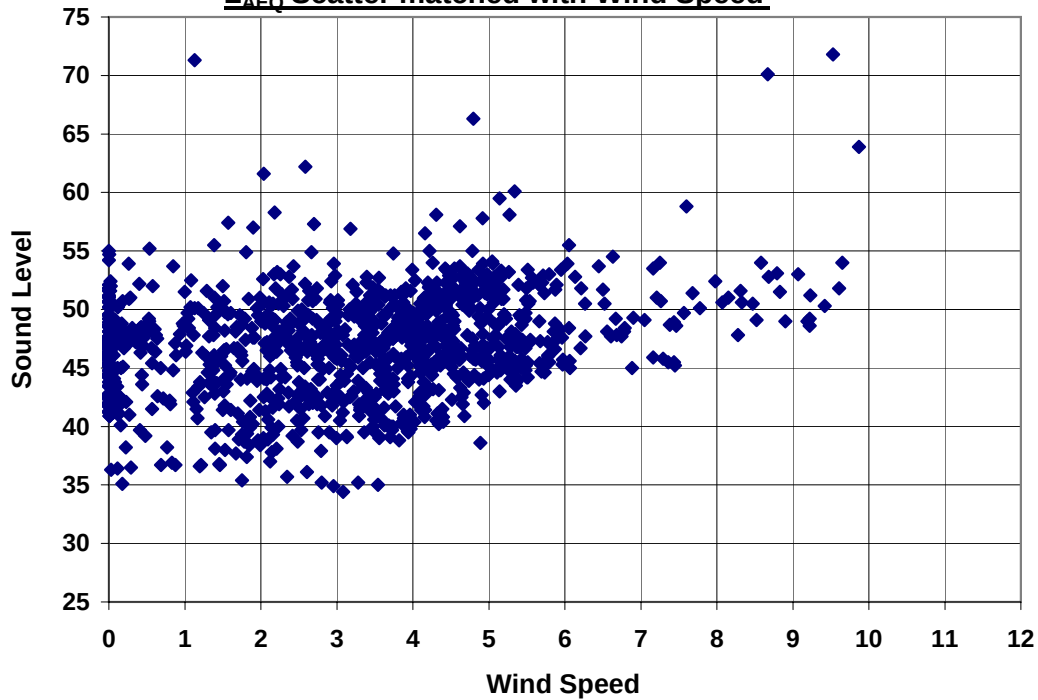
30 Adelaide St., New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

30 Adelaide St., New Berrima - 10 September to 2 October 2019

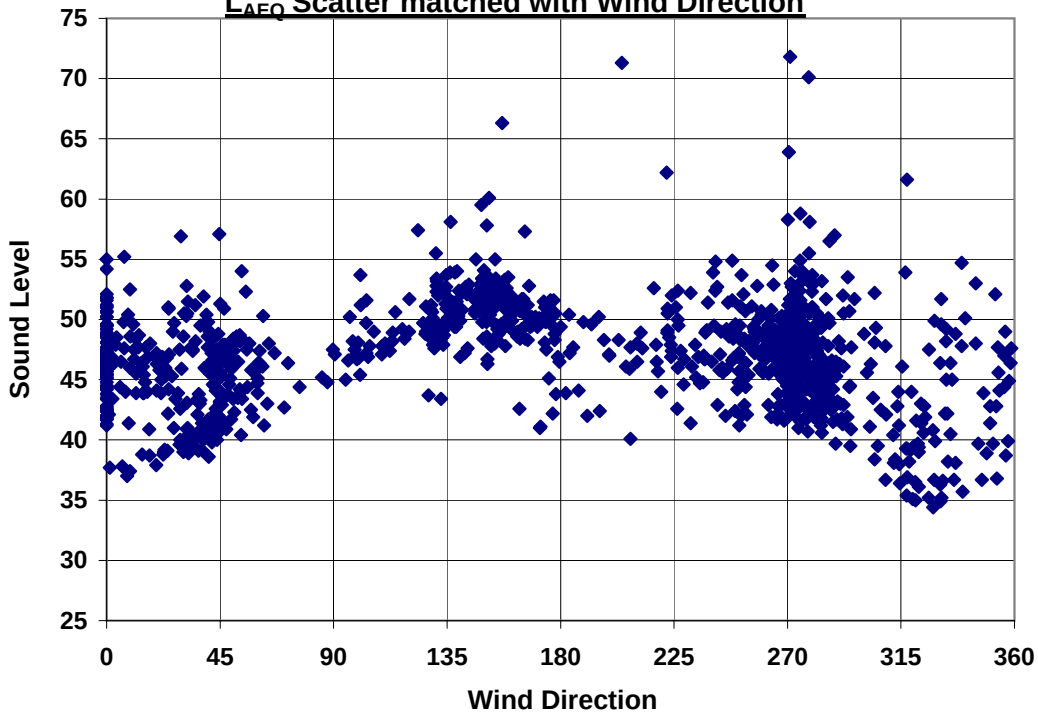
L_{AEQ} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

30 Adelaide St., New Berrima - 10 September to 2 October 2019

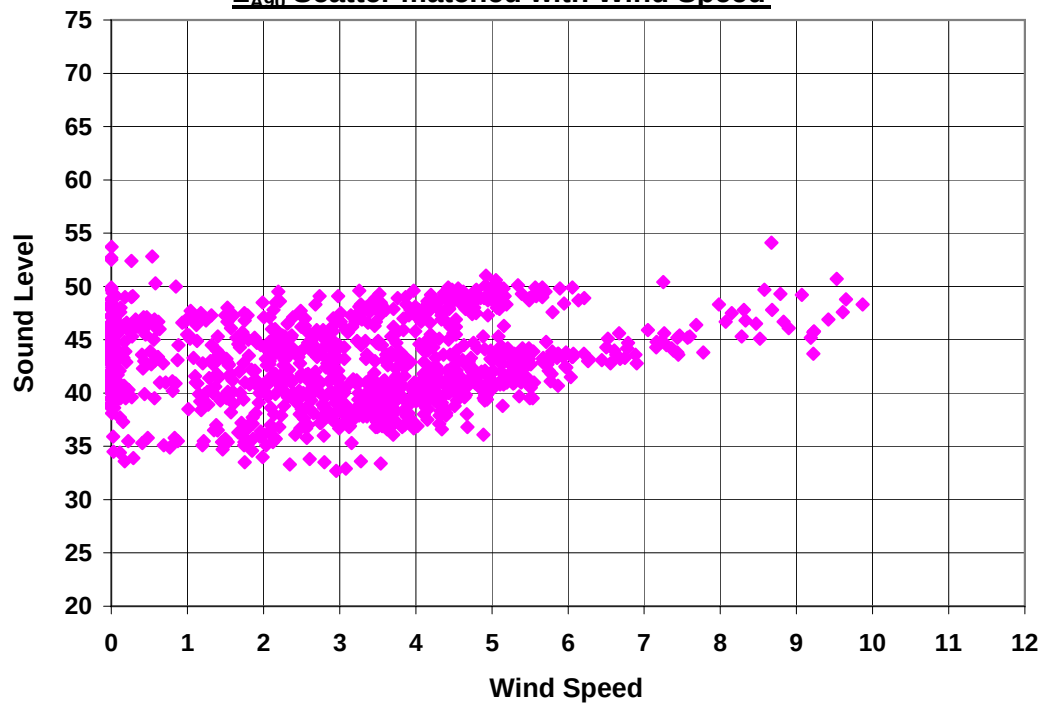
L_{AEQ} Scatter matched with Wind Direction



Berrima Cement Works - Ambient - Background Noise

30 Adelaide St., New Berrima - 10 September to 2 October 2019

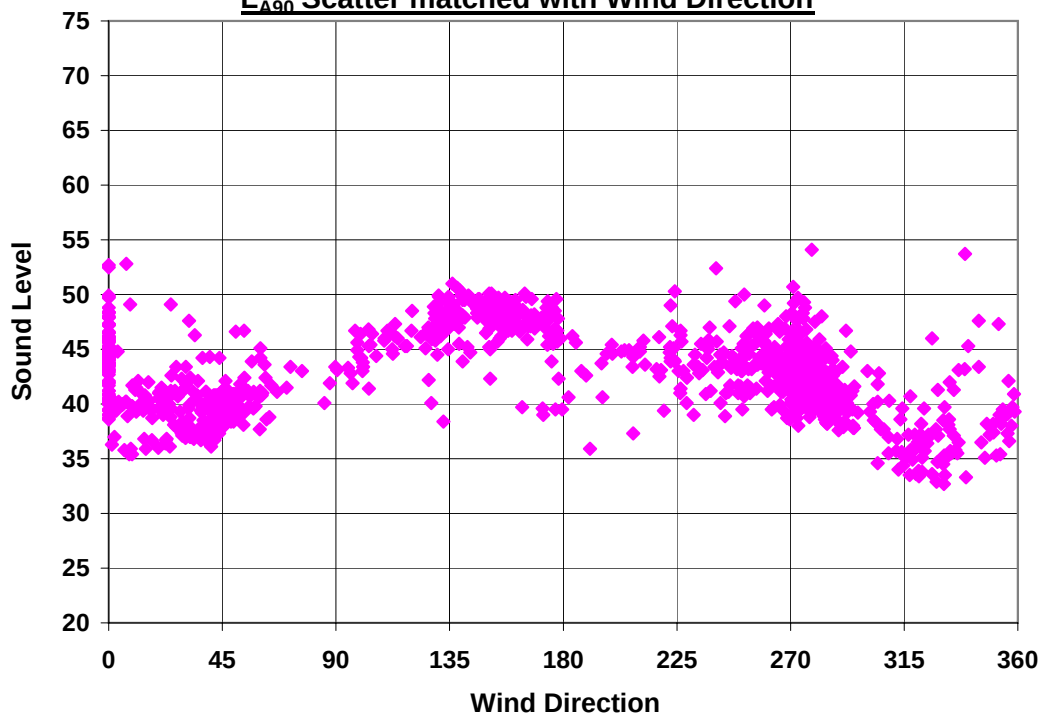
L_{A90} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

30 Adelaide St., New Berrima - 10 September to 2 October 2019

L_{A90} Scatter matched with Wind Direction



Appendix F: Unattended environmental sound level results for Northern Boundary

North Fence, New Berrima

Daytime LAEQ

10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
7:00		55	53	53	54	48	45		57	52	50	49	51	50	53	51	48	57	45	51	3.0
7:15		55	51	53	53	49	45	56	56	52	50	49	51	51	52	51	49	56	45	51	2.9
7:30		53	53	53	52	49	47		56	52	51	49	50	51	52	51	50	56	47	51	2.1
7:45		52	52	54	52	49	46		55	53	50	49	50	50	51	51	53	55	46	51	2.4
8:00		52	52	53	53	49	46	56	56	52	50	48	49	50	49	50	48	56	46	51	2.8
8:15		52	50	52	54	49	46		55	52	49	49	47	48	49	51	48	55	46	50	2.6
8:30		51	50	53	53	47	46	56	56	52	51	49	48	48	50	49	46	56	46	50	3.0
8:45		51	51	53	54	47	46	55	55	51	50	48	47	47	50	49	46	55	46	50	3.1
9:00		50	50	53	54	47	50		55	51	50	48	48	48	49	49	46	55	46	50	2.6
9:15		49	50	53	53	47	48	55	56	51	49	48	48	48	49	49	47	56	47	50	2.9
9:30		49	50	51	52	47	48		56	50	49	47	47	49	49	49	47	56	47	49	2.5
9:45		49	53	51	52	47	48		56	50	49	49	47	50	48	49	47	56	47	50	2.5
10:00		49	52	51	52	48	49	56	56	49	49	47	49	51	49	50	46	56	46	50	2.7
10:15		49	53	49	54	47	48	56	57	48	48	47	49	50	49	51	47	57	47	50	3.0
10:30		49	52	51	52	46	49	56	56	48	50	48	47	54	48	48	49	56	46	50	3.0
10:45		50	53	50	53	45	51		55	48	49	46	47	52	48	49	48	55	45	50	2.7
11:00		50	53	47	52	46	50	57	56	47	49	47	49	51	50	50	46	57	46	50	3.2
11:15	54	50	52	48	52	45	49	57	55	47	49	48	50	51	50	49	46	57	45	50	3.3
11:30	53	51		50	51	46	47	57	55	49	48	48	50	52	49	50	48	57	46	50	3.1
11:45	54	50		50	51	45	49	57	57	47	47	49	48	52	51	50	47	57	45	50	3.3
12:00	53	50		50	51	46		58	56	48	48	49	47	53	50	49	49	58	46	50	3.3
12:15	53	50	52	51	51	44	51		57	48	48	48	47	51	48	51	47	57	44	50	3.0
12:30	53	51	53	49	52	45	50	56	56	47	48	47	49	49	50	50	48	56	45	50	3.2
12:45	53	51	52	49	50	44	50		56	47	48	47	46	50	47	52	50	56	44	50	3.0
13:00	53	51	53	50	48	45	49	55	55	48	48	47	47	51	49	52	48	55	45	50	3.0
13:15	53	51	54	48	48	45	49		56	48	48	46	49	48	50	48	50	56	45	49	3.0
13:30	53	52	52	50	47	46	48	56	55	48	48	47	45	49	49	51	50	56	45	50	3.0
13:45	54	51	53	48	48	47	50		56	50	49	47	46	48	50	50	48	56	46	50	2.7
14:00	53	48	52	47	48	48	50		57	49	49	49	46	48	51	49		57	46	50	2.6
14:15	53	50	51	47	49	49	54		57	48	48	45	45	48	48	50		57	45	50	3.1
14:30	53	51	51	47	49	48	54	56	57	50	48	49	47	51	49	50		57	47	51	3.0
14:45	53	51	51	47	50	50	55	55	57	49	51	51	46	50	49	49		57	46	51	3.0
15:00	52	52	51	48	51	49	55		57	49	51	54	47	48	49	49		57	47	51	2.8
15:15	52	50	50	49	50	49	56		56	48	50	49	46	48	49	50		56	46	50	2.8
15:30	53	49	51	47	50	48	56	58	56	49	49	50	46	51	49	50		58	46	51	3.3
15:45	53	49	51	48	50	49	56	58	56	48	50	49	47	50	49	50		58	47	51	3.1
16:00	53	49	50	48	51	50	55	57	55	48	49	49	50	48	51	51		57	48	51	2.9
16:15	53	49	50	49	50	50	55	57	54	49	48	49	49	49	50	52		57	48	51	2.6
16:30	53	49	50	48	49	49	55		54	50	49		50	48	50	51		55	48	50	2.1
16:45	52	49	51	49	48	49	56	57	54	50	49	49	49	50	50	52		57	48	51	2.7
17:00	53	49	50	49	48	48	55	59	55	50	49	49	49	50	50	51		59	48	51	3.0
17:15	53	49	49	49	52	49	56	58	54	51	49	50	52	50	50	51		58	49	51	2.6
17:30	53	50	49	49	52	48	56	57	54	50	49	50	48	51	50	51		57	48	51	2.7
17:45	54	50	49	48	52	48	56	57	53	50	49	51	48	49	50	51		57	48	51	2.8
18:00	54	50	48	48	52	48	53	57	52	49	49	47	48	49	50	51		57	47	50	2.7
Max	54	55	54	54	54	50	56	59	57	53	51	54	52	54	53	52	53	59	50	54	2.1
Min	52	48	48	47	47	44	45	55	52	47	47	46	45	47	47	48	46	55	44	48	2.8
Ave	53	50	51	50	51	47	51	57	56	49	49	48	48	50	49	50	48	57	47	50	2.5
SD	0.5	1.5	1.4	2.1	1.9	1.7	3.8	0.9	1.1	1.7	1.0	1.5	1.6	1.5	1.2	0.9	1.5	3.8	0.5	1.5	0.7
E Ave	53	51	51	50	51	48	52	57	56	50	49	49	48	50	50	50	48	57	48	51	2.5

Evening LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
18:00	54	50	48	48	52	48	53	57	52	49	49	47	48	49	50	51		57	47	50	2.7
18:15	54	50	48	49	53	49	55	58	53	51	50	51	48	48	50	51		58	48	51	2.7
18:30	54	50	48	48	52	48	54		52	51	50	47	48	47	50	50		54	47	50	2.3
18:45	54	50	48	48	51	49	54	56	53	50	50	47	49	47	51	50		56	47	51	2.6
19:00	54	52	48	49	50	49	55		54	50	50	47	49	47	51	51		55	47	50	2.3
19:15	54	50	49	50	51	48	53		54	50	50	48	50	47	51	50		54	47	50	2.2
19:30	54	52	49	50	51	48	54		54	50	49	48	50	50	52	50		54	48	51	2.1
19:45	54	53	51	50	53	49	54		54	50	49	47	51	50	51	50		54	47	51	2.2
20:00	54	51	51	50	52	47	55	57	54	50	49	47	50	50	50	50		57	47	51	2.7
20:15	54	50	53	48	51	49	54	56	54	50	48	46	49	51	52	50		56	46	51	2.6
20:30	54	49	53	48	52	49	53	56	54	50	49	46	50	51	51	50		56	46	51	2.5
20:45	55	50	53	48	50	48	55	55	54	49	49	46	50	51	52	50		55	46	51	2.7
21:00	55	50	53	47	47	47	55	55	54	49	49	46	48	50	51	50		55	46	50	3.2
21:15	54	50	54	49	48	47	56	55	53	49	49	46	45	50	50	49		56	45	50	3.3
21:30	53	51	54	50	48	46	55	55	54	48	50	46	44	50	50	49		55	44	50	3.2
21:45	54	50	54	51	49	47		55	55	49	49	47	51	50	50	50		55	47	51	2.6
22:00	53	50	54	51	47	48		53	53	49	49	47	47	53	50	49		54	47	50	2.5
Max	55	53	54	51	53	49	56	58	55	51	50	51	51	53	52	51		58	49	53	2.4
Min	53	49	48	47	47	46	53	55	52	48	48	46	44	47	50	49		55	44	49	2.9
Ave	54	50	51	49	50	48	54	56	54	50	49	47	49	49	51	50		56	47	51	2.5
SD	0.5	1.0	2.4	1.1	1.9	0.9	0.8	1.1	0.8	0.8	0.4	1.1	1.9	1.6	0.8	0.7		2.4	0.4	1.1	0.6
E Avg	54	51	52	49	51	48	54	56	54	50	49	47	49	50	51	50		56	47	51	2.5

Night LAEQ

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD		
22:00	53	50	54	51	47	48	57	56	53	49	49	47	47	53	50	49		54	47	50	2.5		
22:15	54	51	54	52	47	48			54	49	49	47	45	52	50	50	50		56	45	50	3.1	
22:30	55	51	50	51	47	50			54	49	49	49	45	50	50	50	50		55	45	50	2.5	
22:45	55	50	49	52	47	50			56	54	49	48	48	43	49	50	49		56	43	50	3.1	
23:00	53	50	51	50	47	48			56	54	49	48	47	45	50	51	49		56	45	50	2.9	
23:15	51	51	51	51	49	48	55	56	54	49	48	47	44	49	51	50		57	44	50	3.2		
23:30	53	50	51	52	51	50			56	54	49	48	48	45	50	51	51		56	45	51	2.7	
23:45	52	51	50	49	49	49			56	54	48	48	47	45	50	51	52		56	45	50	2.8	
0:00	50	51	51	49	49	49			56	53	48	48	47	46	49	51			56	46	50	2.7	
0:15	53	50	52	48	49	47			56	54	48	48	48	45	49	51	51		56	45	50	2.9	
0:30	52	48	54	48	49	46	55	56	54	47	48	49	45	51	50	51		57	45	50	3.1		
0:45	52	49	54	48	49	45			57	53	47	48	49	45	51	50	50		57	45	50	3.2	
1:00	53	48	54	48	49	43			57	52	48	47	48	46	51	51	50		57	43	50	3.4	
1:15	51	48	54	48	51	43			56	52	48	47	47	47	52	51	50		56	43	50	3.4	
1:30	55	50	54	48	51	46			57	51		47	47	46	53	51	50		57	46	50	3.4	
1:45	55	49	55	48	51	46	55	56	52	47	48	48	46	52	51	50		57	46	50	3.4		
2:00	55	48	58	49	49	45			57	52	47	47	52	45	50	51	50		58	45	50	3.9	
2:15	55	49	57	48	51	46			56	52	48	48	53	45	50	53	50		57	45	51	3.6	
2:30	55	50	55	48	51	45			55	54	48	48	52	44	50	51	50		55	44	50	3.4	
2:45	54	49	56	48	51	45			55	53	48	48	52	48	48	54	50		56	45	51	3.3	
3:00	54	48	56	50	51	44	55	56	54	48	48	51	43	48	53	50		56	43	50	3.8		
3:15	53	49	55	48	51	43			56	54	48	49	50	43	51	55	50		56	43	51	4.0	
3:30	55	49	56	47	50	41			56		48	49	50	45	50	52	51		56	41	50	4.2	
3:45	56	50	56	47	51	43			56		48	48	50	44	49	51	50		56	43	50	3.9	
4:00	54	50	55	48	50	44			55	54	49	50	52	45	50	53	49		55	44	50	3.3	
4:15	55	51	52	48	52	43	55	56	54	49	48	52	45	50	52	49		56	43	50	3.5		
4:30	57	50	52	50	51	42			56		48	48	51	44	51	52	49		57	42	50	3.9	
4:45	57	50	52	50	52	43			54	56	54	49	48	51	44	52	50	48		57	43	51	3.8
5:00	57	50	51	51	48	43			55	56	53	49	48	53	46	51	51	48		57	43	51	3.7
5:15	57	51	53	51	48	45			56	56	53	49	47	51	49	52	52	48		57	45	51	3.3
5:30	59	52	57	51	47	46	58	54			49	48	51	47	51	53	50		59	46	52	3.9	
5:45	57	52	56	51	48	45	57	54			50	48	50	47	52	52	49		57	45	51	3.5	
6:00	57	52	55	52	50	46	57	53			50	48	50	52	52	51	49		57	46	52	3.1	
6:15	55	52	54	53	48	45	57	53			51	48	50	52	53	51	49		57	45	51	3.1	
6:30	57	53	55	54	47	46	56	58	51	48	52	51	53	51	49		58	46	52	3.5			
6:45	55	53	54	54	47	46			56	53	50	48	51	51	53	50	48		56	46	51	3.1	
7:00	55	53	53	54	48	45			57	52	50	49	51	50	53	51	48		57	45	51	3.0	
Max	59	53	58	54	52	50	57	58	54	51	50	53	52	53	55	52		58	50	53	2.5		
Min	50	48	49	47	47	41	54	55	51	47	47	47	43	48	50	48		55	41	48	3.6		
Ave	54	50	54	50	49	46	55	56	53	49	48	50	46	51	51	50		56	46	50	3.0		
SD	2.0	1.3	2.2	1.9	1.6	2.3	0.9	0.7	0.8	1.0	0.7	1.9	2.5	1.4	1.2	1.0		2.5	0.7	1.4	0.6		
E Avg	55	50	54	50	50	46	55	56	53	49	48	50	47	51	51	50		56	46	51	2.9		
24hr	53	52	51	52	51	49	52	56	56	51	49	48	49	49	50	51	49	56	48	51	2.3		

North Fence, New Berrima
Daytime LA90 10 September to 2 October 2019

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
7:00	52	54	50	51	51	45	42		55	50	48	46	48	48	50	48	45	55	42	49	3.4
7:15		53	49	51	50	45	42	54	54	50	48	47	49	48	49	49	46	54	42	49	3.3
7:30		49	49	51	50	46	43		54	50	48	46	47	49	49	49	45	54	43	48	2.6
7:45		50	49	52	50	46	44		54	50	48	46	47	48	48	48	45	54	44	48	2.7
8:00		50	48	51	51	46	43	54	54	49	47	46	47	47	46	46	44	54	43	48	3.3
8:15		50	48	50	51	46	43		54	50	47	46	46	46	46	47	43	54	43	48	3.0
8:30		49	48	50	50	45	43	54	54	49	47	46	46	45	46	47	43	54	43	48	3.3
8:45		48	48	51	51	45	44	54	54	49	47	45	46	45	47	46	42	54	42	47	3.4
9:00		46	47	51	51	45	45		53	49	47	45	46	46	46	46	42	53	42	47	2.9
9:15		46	47	50	51	45	44	53	54	48	47	45	46	46	46	47	43	54	43	47	3.1
9:30		46	47	49	49	45	44		54	47	46	44	45	46	45	47	43	54	43	46	2.8
9:45		46	49	49	50	45	45		54	47	46	45	45	46	44	47	43	54	43	47	2.8
10:00		47	49	48	49	45	46	54	53	47	45	45	46	48	45	47	41	54	41	47	3.1
10:15		46	50	46	51	44	46	54	55	46	46	44	46	48	45	47	43	55	43	47	3.4
10:30		47	48	48	49	44	46	54	54	46	47	45	46	48	45	45	44	54	44	47	3.2
10:45		46	48	48	49	43	48		53	46	47	44	45	47	44	45	42	53	42	46	2.7
11:00		47	50	45	49	44	47	54	53	45	46	45	45	48	46	47	42	54	42	47	3.2
11:15		52	47	49	44	49	43	45	55	53	45	46	44	46	46	47	43	55	43	47	3.4
11:30	51	48		47	49	43	45	55	53	45	45	45	46	47	46	46	42	55	42	47	3.5
11:45	51	46		46	49	43	46	55	54	44	45	45	46	49	47	46	43	55	43	47	3.5
12:00	50	47		46	49	42		55	54	45	45	46	45	48	46	47	43	55	42	47	3.7
12:15	50	47	49	46	48	42	47		54	45	45	46	45	48	44	47	43	54	42	46	3.0
12:30	50	48	49	47	49	43	47	55	54	45	45	44	45		45	47	43	55	43	47	3.5
12:45	50	48	49	47	48	42	47		54	44	46	44	44	47	44	48	45	54	42	46	2.8
13:00	51	48	50	47	46	43	47	54	53	45	45	43	44	48	45	49	43	54	43	47	3.3
13:15	50	49	51	44	45	43	46		54	46	45	43	44		45	45	42	54	42	46	3.2
13:30	50	49	50	45	45	44	45	54	53	45	45	45	43	46	45	47	45	54	43	47	3.2
13:45	50	49	50	45	46	44	47		54	44	45	45	43	46	46	47	45	54	43	46	2.8
14:00	51	45	49	44	46	44	47		55	45	46	44	43		44	46	45	55	43	46	2.9
14:15	50	47	47	44	46	45	51		54		45		43	46	45	47		54	43	47	3.2
14:30	51	48	48	45	47	45	52	54	55	47	45	45	43	47	45	46		55	43	47	3.5
14:45	50	48	48	44	46	45	52	53	55	46	48	46	43	47	45		55	43	48	3.4	
15:00	50	47	48	46	48	46	54		55	46	46	48	44	45	45	45		55	44	47	3.1
15:15	50	47	48	45	47	46	54		54	46	46	46	44	45	46	46		54	44	47	3.0
15:30	51	45	48	45	47	46	54	55	54	45	45	46	44	47	45	47		55	44	48	3.7
15:45	50	46	47	45	47	47	54	56	53	45	46	46	44	46	46	47		56	44	48	3.5
16:00	50	46	47	45	47	47	53	55	53	45	46	47	45	45	47	47		55	45	48	3.2
16:15	50	46	48	46	48	46	52	55	52	46	45	47	47	46	46	48		55	45	48	2.9
16:30	50	46	47	46	47	46	53		52	48	46		46	45	47	48		53	45	47	2.5
16:45	50	47	48	46	46	46	53	56	52	48	46	47	46	47	48	47		56	46	48	3.1
17:00	51	47	47	46	45	45	53	56	52	48	46	46	46	48	47	48		56	45	48	3.2
17:15	51	47	47	46	47	46	53	55	52	48	46	47	45	47	47	48		55	45	48	2.8
17:30	51	48	47	46	49	46	54	55	52	48	46	47	46	47	47	47		55	46	48	2.9
17:45	52	48	46	45	50	46	54	55	51	47	47	45	46	47	48	47		55	45	48	3.0
18:00	52	49	46	47	50	46	51	55	50	47	46	45	45	46	46	47		55	45	48	2.8
Max	52	54	51	52	51	47	54	56	55	50	48	48	49	49	50	49	46	56	46	51	2.8
Min	50	45	46	44	45	42	42	53	50	44	45	43	43	45	44	45	41	53	41	45	3.2
Ave	51	48	48	47	48	45	48	54	53	47	46	45	45	47	46	47	43	54	43	48	2.9
SD	0.6	1.8	1.1	2.4	1.8	1.4	4.1	0.7	1.0	1.9	1.0	1.1	1.4	1.2	1.4	1.0	1.2	4.1	0.6	1.5	0.8
90%	50	46	47	44	46	43	43	54	52	45	45	44	43	45	44	46	42	54	42	46	3.2
																			Median	45	

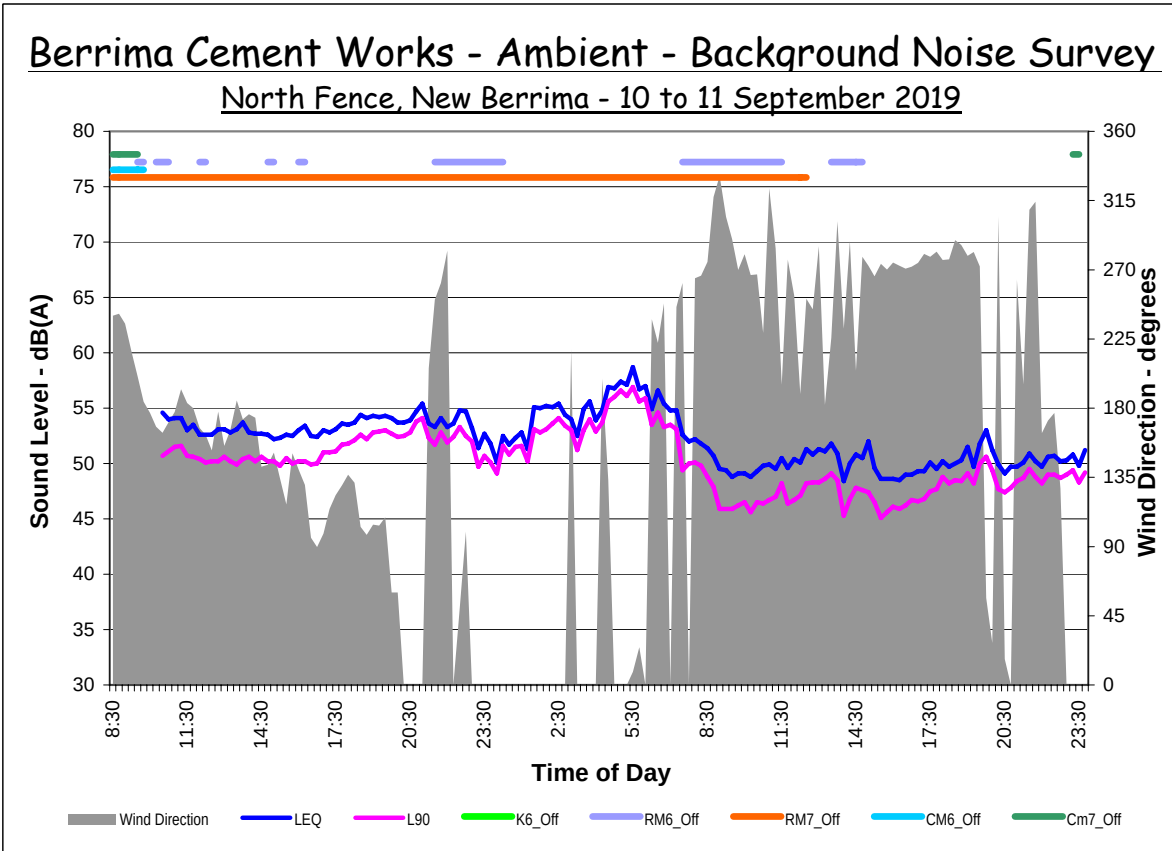
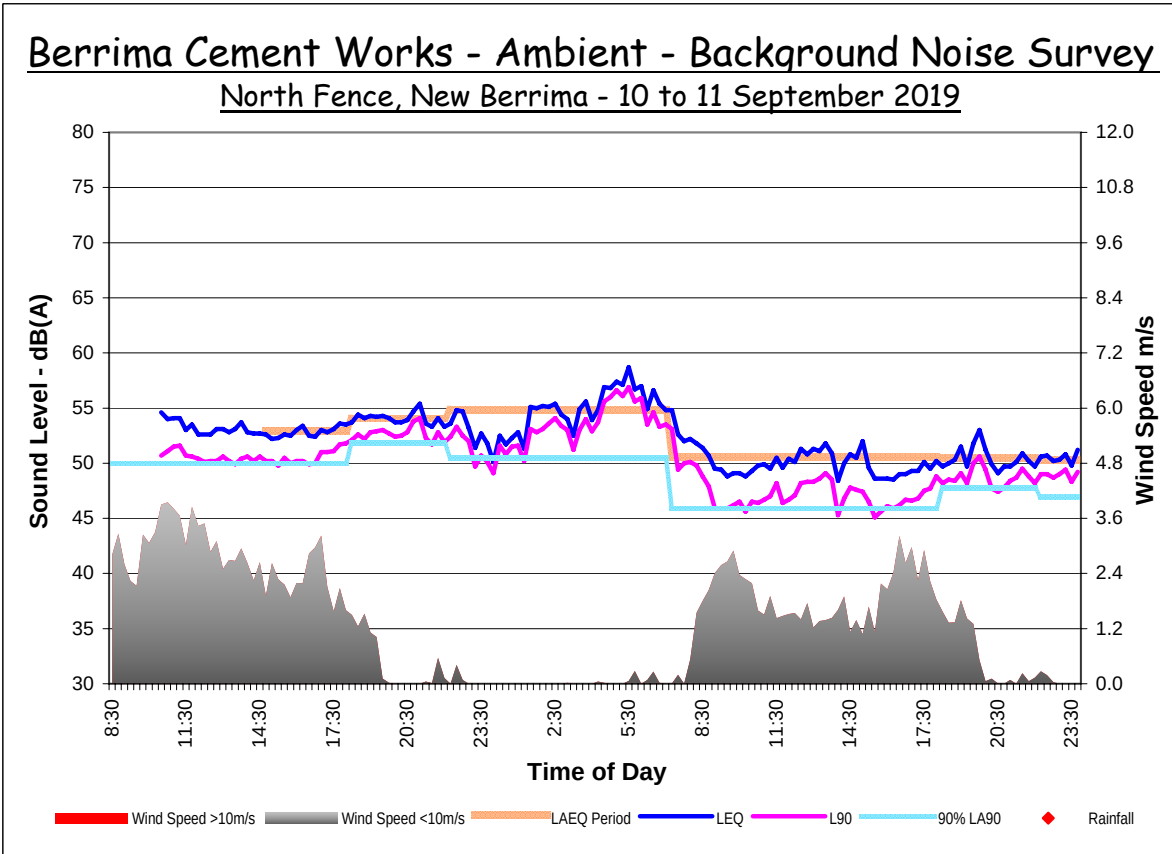
Evening LA90

Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
18:00	52	49	46	47	50	46	51	55	50	47	46	45	45	46	46	47		55	45	48	2.8
18:15	52	48	46	47	51	46	52	55	51	48	47	46	45	46	47	48		55	45	48	2.9
18:30	53	49	46	47	50	46	52		50	48	48	44	46	46	48	48		52	44	48	2.1
18:45	52	48	46	46	50	46	52	54	51	48	47	44	48	45	49	48		54	44	48	2.6
19:00	53	49	46	47	49	46	53		51	48	47	45	48	46	49	47		53	45	48	2.1
19:15	53	48	47	48	49	45	51		53	47	47	45	49	46	48	47		53	45	48	2.2
19:30	53	50	47	48	50	46	52		52	47	46	45	49	47	49	47		52	45	48	2.3
19:45	53	51	49	48	50	45	52		53	47	46	45	49	48	49	47		53	45	48	2.4
20:00	52	49	49	47	51	45	53	55	52	48	46	44	48	48	48	47		55	44	49	2.9
20:15	53	48	51	47	50	46	52	54	52	47	46	44	48	48	49	47		54	44	48	2.7
20:30	53	47	51	46	49	46	51	54	52	47	47	44	49	49	48	47		54	44	48	2.6
20:45	54	48	52	46	48	46	53	53	52	46	47	43	48	48	47	47		53	43	48	2.9
21:00	54	48	51	45	46	46	54	53	52	46	47	44	45	47	47	47		54	44	48	3.2
21:15	52	49	53	46	46	45	54	53	52	46	46	44	43	47	48	46		54	43	48	3.4
21:30	52	50	52	48	46	45	53	53	52	45	46	44	43	47	48	46		53	43	48	3.4
21:45	53	49	52	49	47	45		53	52	47	47	44	44	47	47	46		53	44	48	2.9
22:00	52	48	53	48	45	45		52	52	47	47	45	44	49	48	46		53	44	47	2.7
Max	54	51	53	49	51	46	54	55	53	48	48	46	49	49	49	48		55	46	50	2.9
Min	52	47	46	45	45	45	51	53	50	45	46	43	43	45	46	46		53	43	47	2.9
Ave	53	49	49	47	49	46	52	54	52	47	47	44	47	47	48	47		54	44	48	2.8
SD	0.6	0.8	2.8	0.9	1.9	0.5	0.8	1.0	0.7	0.7	0.5	0.7	2.2	1.1	0.9	0.5		2.8	0.5	1.0	0.7
90%	52	48	46	46	46	45	51	53	51	46	46	44	43	46	47	46		53	43	47	2.9
																			Median	46	

Night LA90

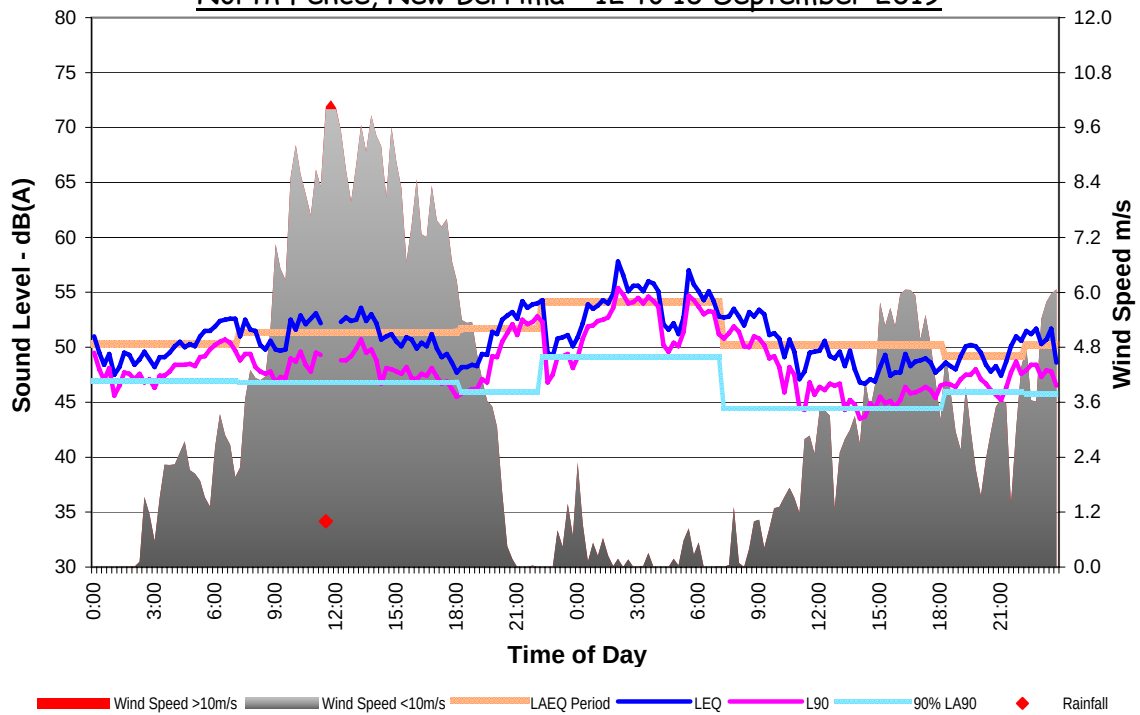
Time	10/9	11/9	12/9	13/9	14/9	15/9	16/9	17/9	18/9	19/9	20/9	21/9	22/9	23/9	24/9	25/9	26/9	Maximum	Minimum	Average	SD
22:00	52	48	53	48	45	45			52	47	47	45	44	49	48	46		53	44	47	2.7
22:15	52	49	52	48	46	45		54	52	46	46	45	43	49	48	47		54	43	48	3.2
22:30	53	49	47	48	45	47			52	47	46	45	43	47	47	47		52	43	47	2.2
22:45	53	49	48	48	46	47		54	53	47	46	46	42	47	48	46		54	42	47	2.9
23:00	52	49	49	47	46	45		54	53	47	46	45	43	48	49	46		54	43	47	3.0
23:15	50	49	49	48	47	45	55	54	53	47	46	45	43	47	49	49		55	43	48	3.3
23:30	51	48	49	48	48	47		54	53	47	45	45	44	48	50	49		54	44	48	2.8
23:45	50	49	48	47	47	45		54	53	46	45	44	44	47	49	50		54	44	48	3.1
0:00	49	50	49	46	47	45		54	52	46	45	45	45	47	48			54	45	48	3.0
0:15	52	48	51	46	48	44		54	52	45	45	46	44	47	49	50		54	44	48	3.1
0:30	51	47	52	46	48	43		55	52	45	46	46	44	49	49	49		55	43	48	3.3
0:45	52	48	52	46	48	43		55	52	45	45	47	44	49	49	49		55	43	48	3.4
1:00	52	46	52	46	48	42		55	51	45	45	47	45	49	49	49		55	42	48	3.5
1:15	50	47	53	46	48	42		55	51	45	44	45	45	50	50	48		55	42	48	3.5
1:30	53	48	53	46	50	42		55	50		44	45	45	51	49	48		55	42	48	3.6
1:45	53	48	54	46	49	42		55	51	44	45	47	45	50	50	48		55	42	48	3.7
2:00	53	47	55	47	48	41		55	51	44	44	50	44	47	49	48		55	41	48	4.1
2:15	54	48	55	47	47	40		54	51	45	44	51	43	47	50	49		55	40	48	4.2
2:30	54	47	54	47	48	40		53	53	45	45	50	43	47	49	48		54	40	48	3.9
2:45	53	47	54	46	48	40		53	52	45	45	50	44	46	53	48		54	40	48	3.9
3:00	53	46	55	46	48	40		54	52	45	46	49	42	46	52	49		55	40	48	4.2
3:15	51	47	54	46	49	41	53	54	52	45	46	48	41	48	51	49		54	41	48	4.2
3:30	53	47	55	45	49	39		54		45	46	48	42	48	50	49		55	39	48	4.4
3:45	54	48	54	45	48	40		53		45	46	48	41	47	50	49		54	40	47	4.1
4:00	53	48	54	46	49	40		53	52	46	46	50	42	49	51	47		54	40	48	4.0
4:15	54	48	50	46	49	41		54	53	46	46	50	41	48	50	47		54	41	48	3.7
4:30	56	48	50	47	48	40	53	54		46	45	49	42	49	49	47		54	40	48	3.7
4:45	56	49	50	48	48	41	52	55	53	46	45	49	42	50	49	46		55	41	48	3.8
5:00	57	48	50	49	47	41	53	54	52	47	45	49	44	50	49	46		54	41	48	3.5
5:15	56	49	51	48	46	41		54	52	46	45	49	45	50	49	46		54	41	48	3.4
5:30	57	49	55	48	46	42	54	55	53	47	45	49	45	50	50	47		55	42	49	3.9
5:45	56	50	54	49	46	42		55	52	48	45	48	45	49	49	46		55	42	48	3.7
6:00	56	50	54	50	46	42		55	52	47	45	48	45	51	48	46		55	42	49	3.6
6:15	54	51	53	51	47	43		55	52	48	45	48	46	51	48	46		55	43	49	3.5
6:30	55	51	53	52	46	43		56		48	45	48	46	50	48	45		56	43	49	3.7
6:45	53	50	53	51	46	42		54	52	48	45	49	47	49	48	45		54	42	48	3.4
7:00	54	50	51	51	45	42		55	50	48	46	48	48	50	48	45		55	42	48	3.2
Max	57	51	55	52	50	47	55	56	53	48	47	51	48	51	53	50		57	47	51	3.2
Min	49	46	47	45	45	39	52	53	50	44	44	44	41	46	47	45		53	39	46	3.7
Ave	53	48	52	47	47	42	53	54	52	46	45	47	44	48	49	47		54	42	49	3.5
SD	2.0	1.2	2.3	1.7	1.3	2.2	0.9	0.7	0.7	1.0	0.6	2.0	1.6	1.4	1.1	1.5		2.3	0.6	1.4	0.5
90%	51	47	49	46	46	40	52	53	51	45	44	45	42	47	48	46		53	40	47	3.6
																			Median	46	

Two Day Results of Ambient Noise Monitoring



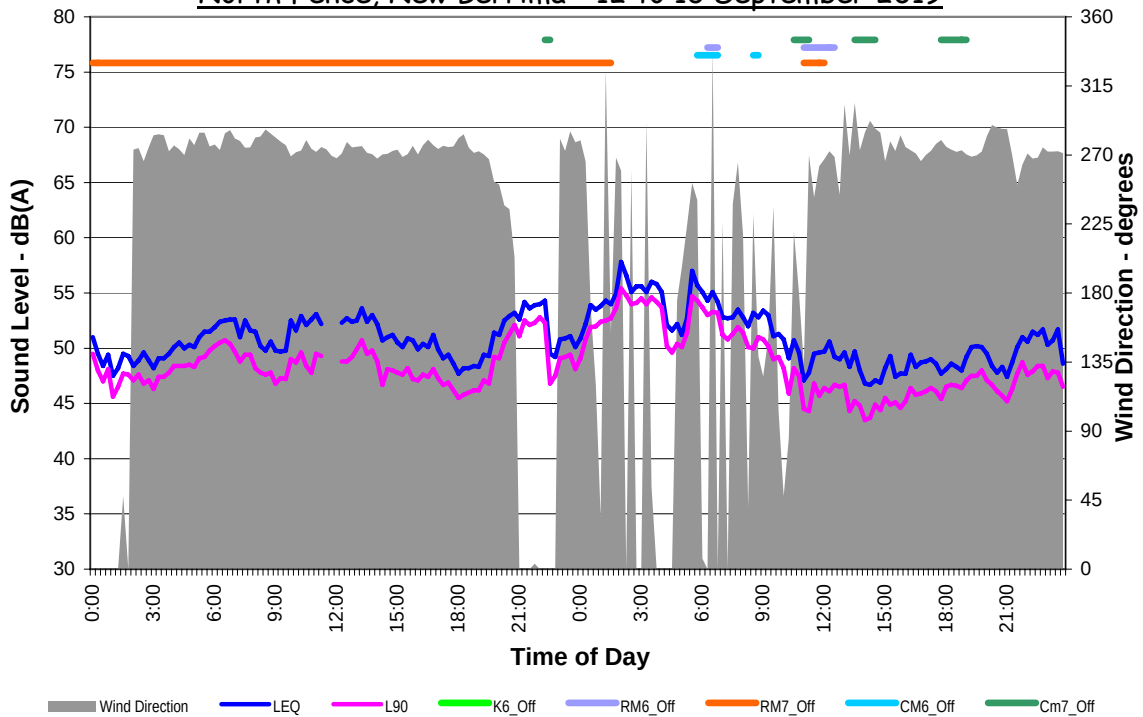
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 12 to 13 September 2019



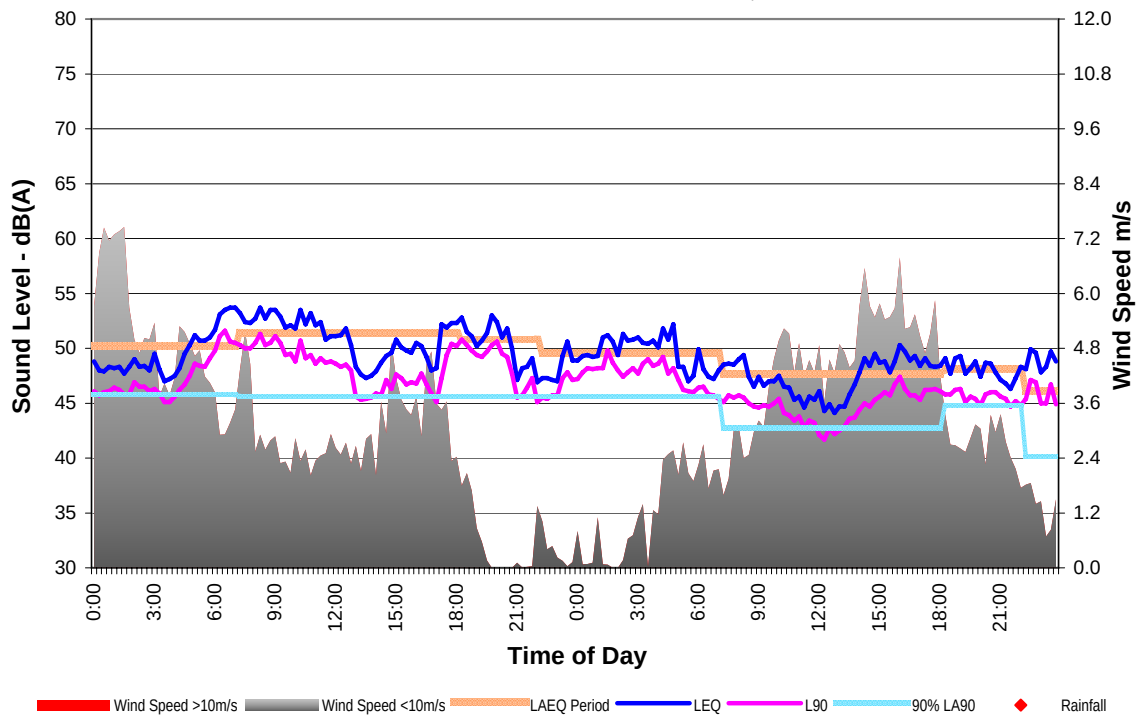
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 12 to 13 September 2019



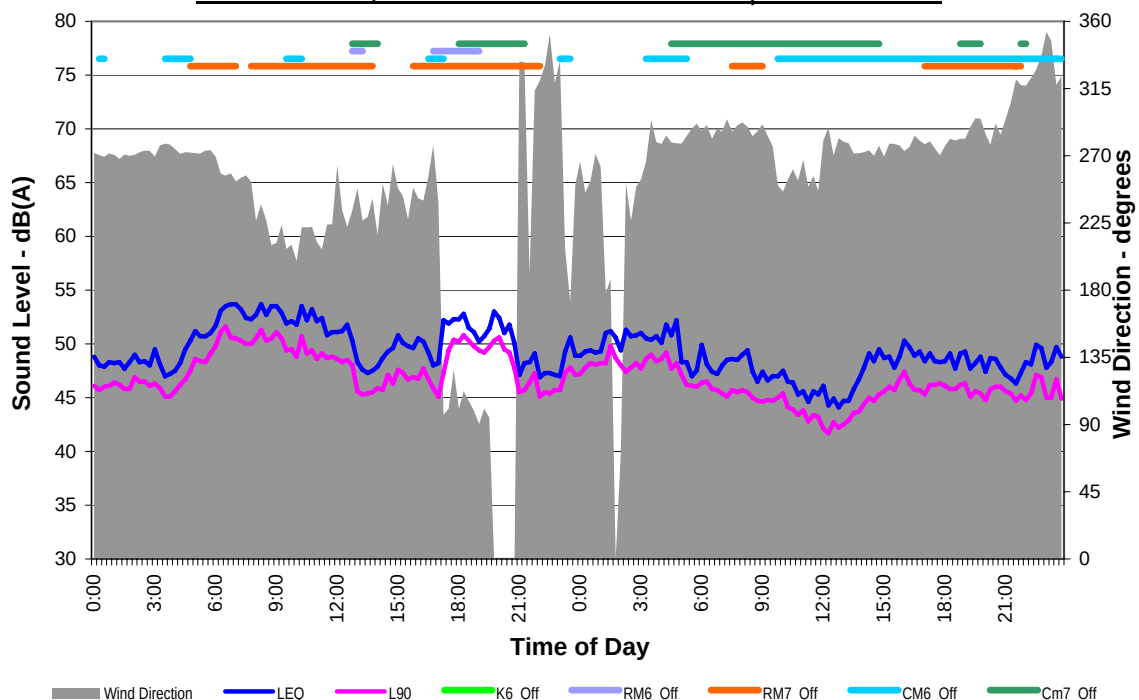
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 14 to 15 September 2019



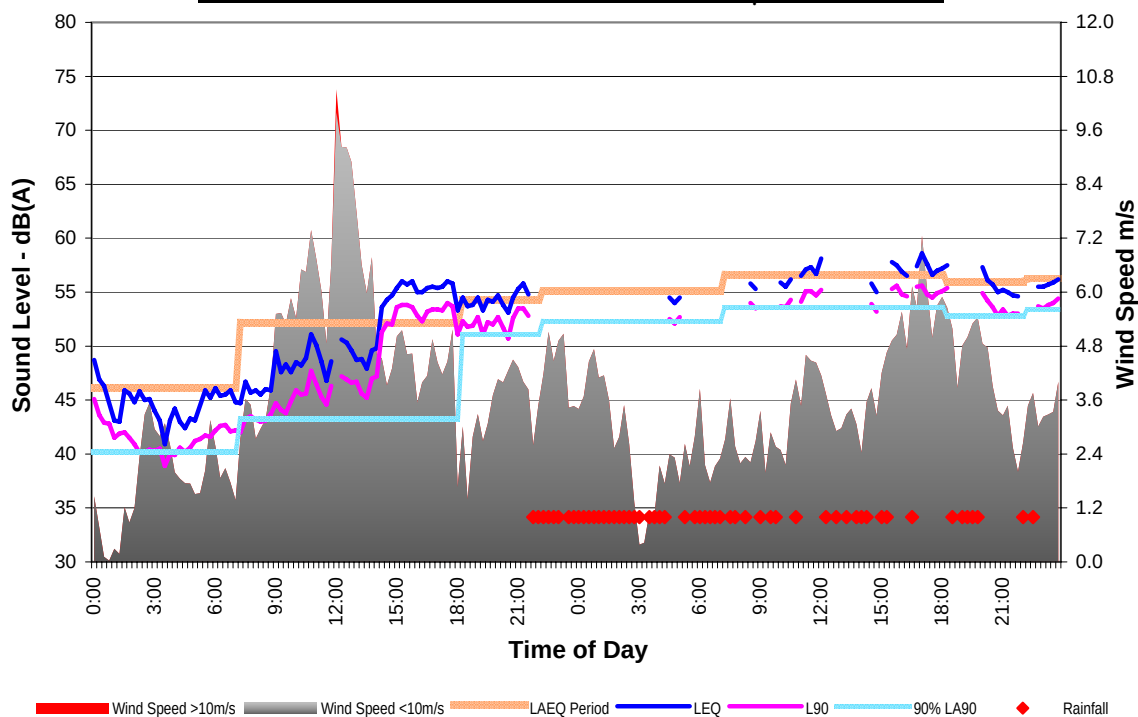
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 14 to 15 September 2019



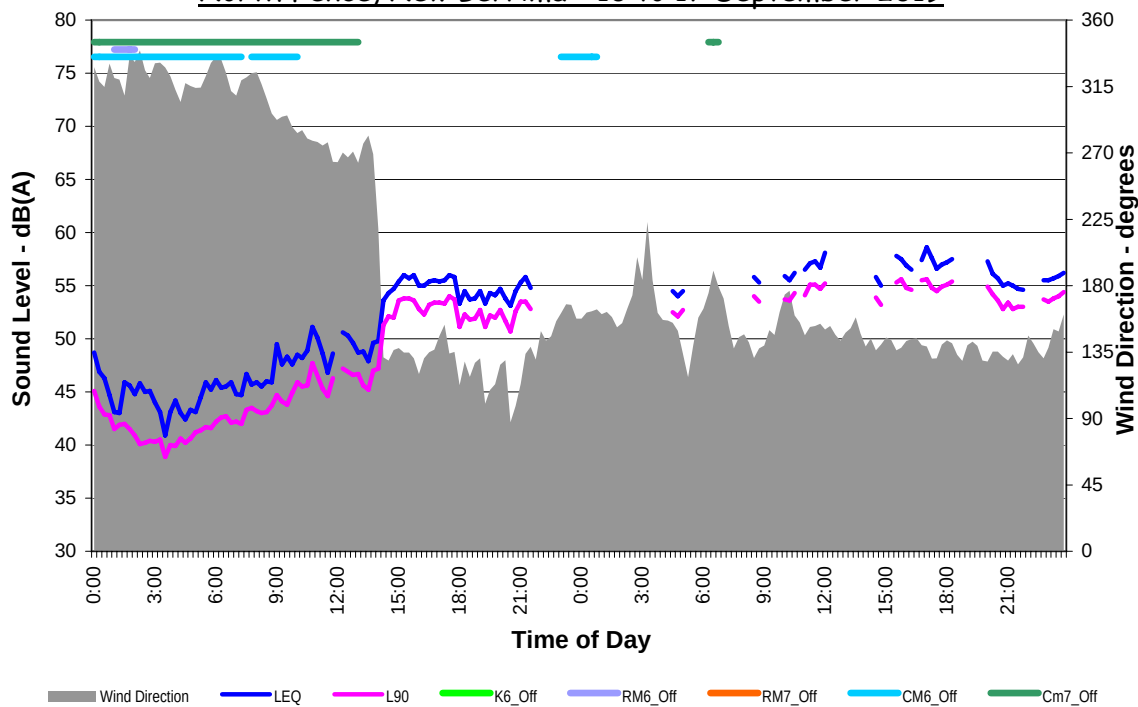
Berrima Cement Works - Ambient - Backaround Noise Survey

North Fence, New Berrima - 16 to 17 September 2019



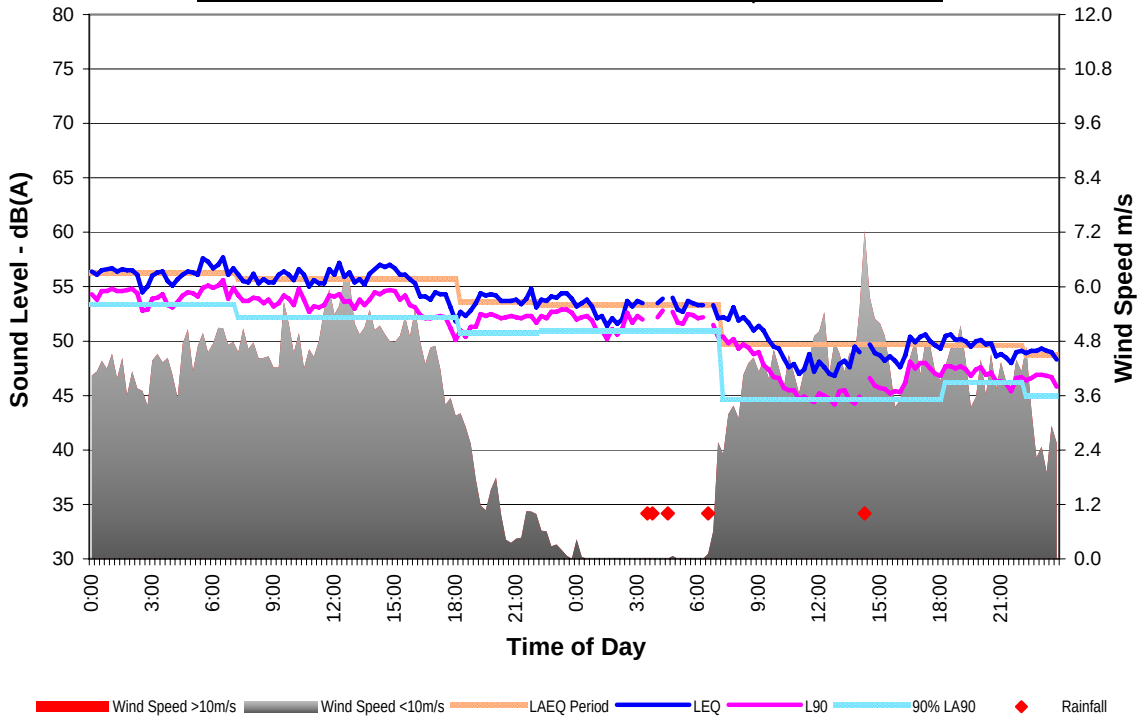
Berrima Cement Works - Ambient - Backaround Noise Survey

North Fence, New Berrima - 16 to 17 September 2019



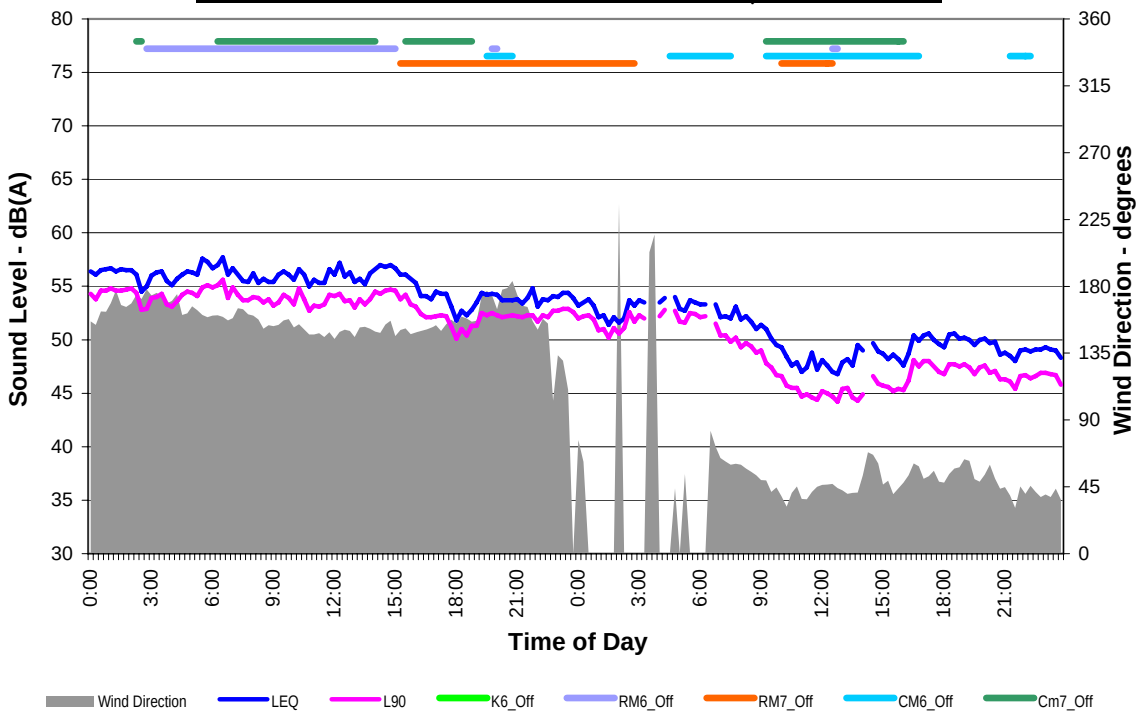
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 18 to 19 September 2019



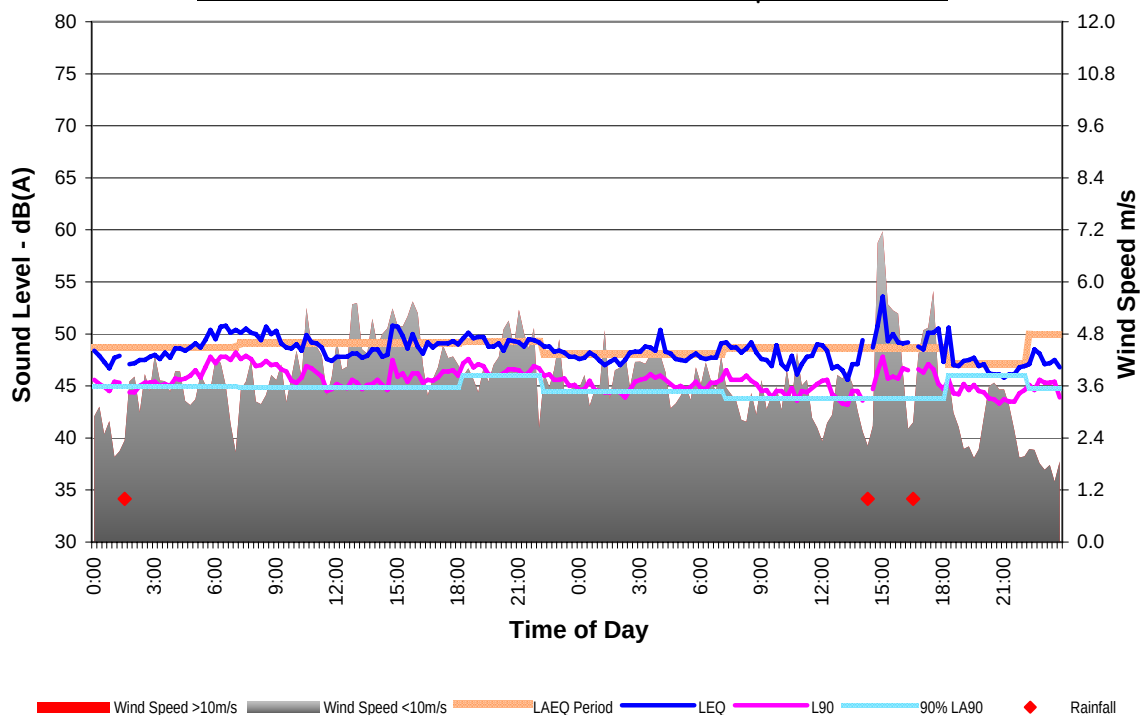
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 18 to 19 September 2019



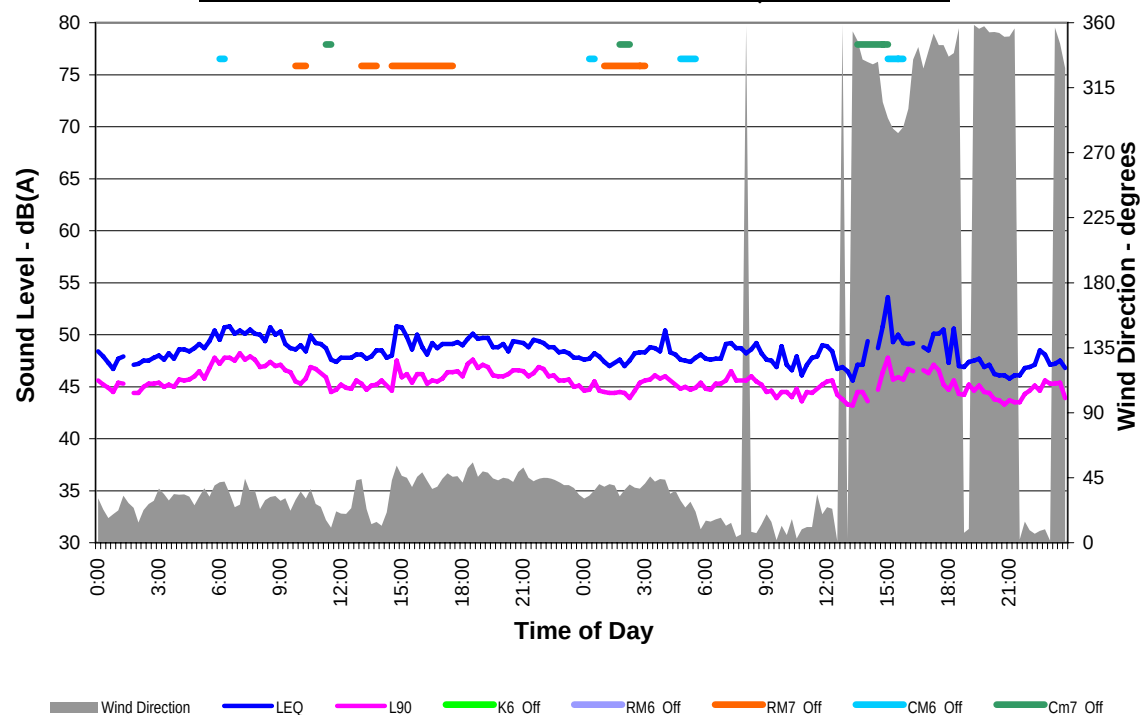
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 20 to 21 September 2019



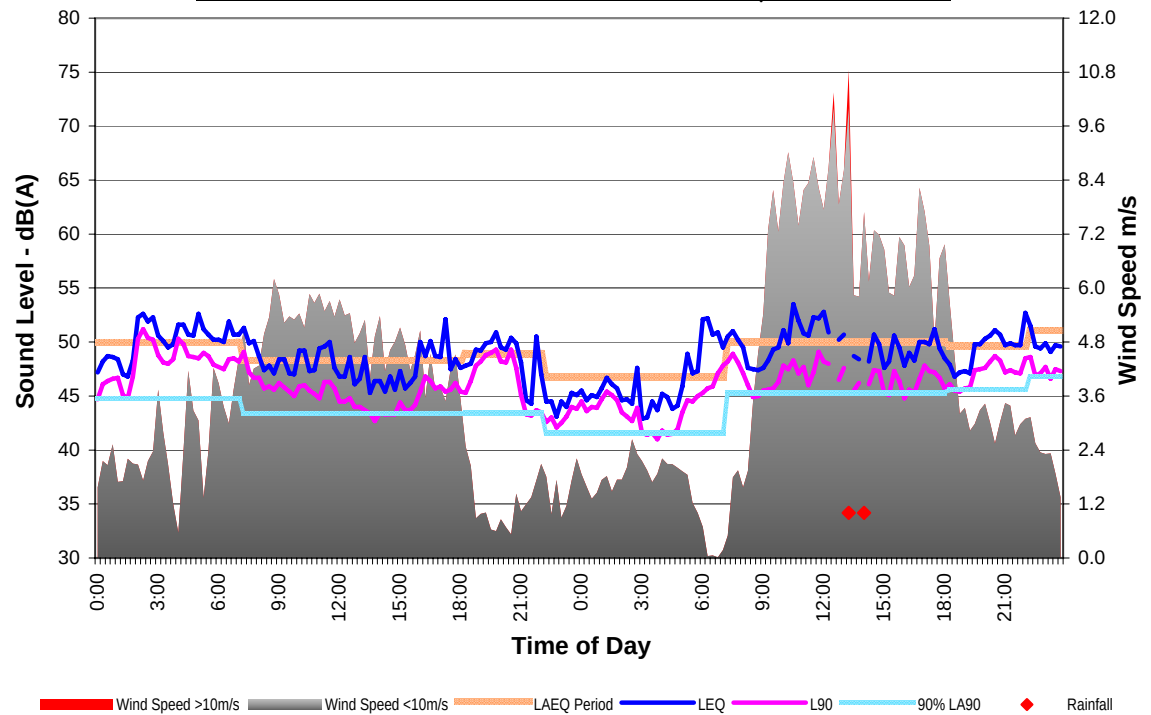
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 20 to 21 September 2019



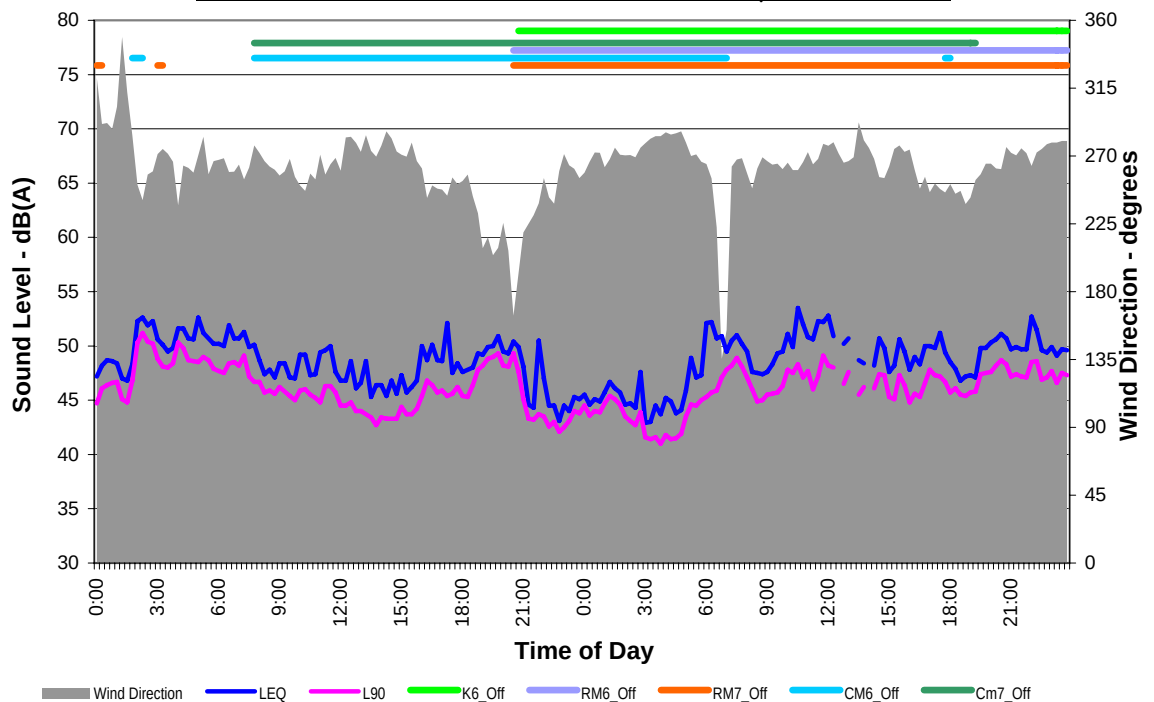
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 22 to 23 September 2019



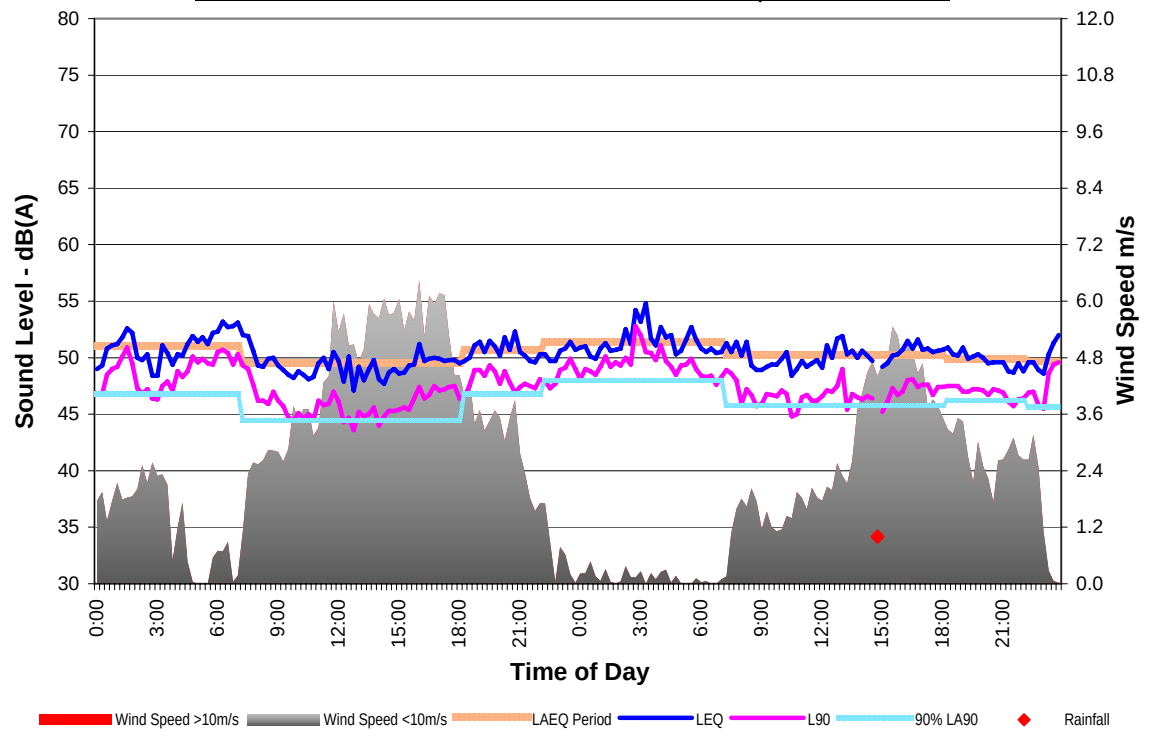
Berrima Cement Works - Ambient - Background Noise Survey

North Fence, New Berrima - 22 to 23 September 2019



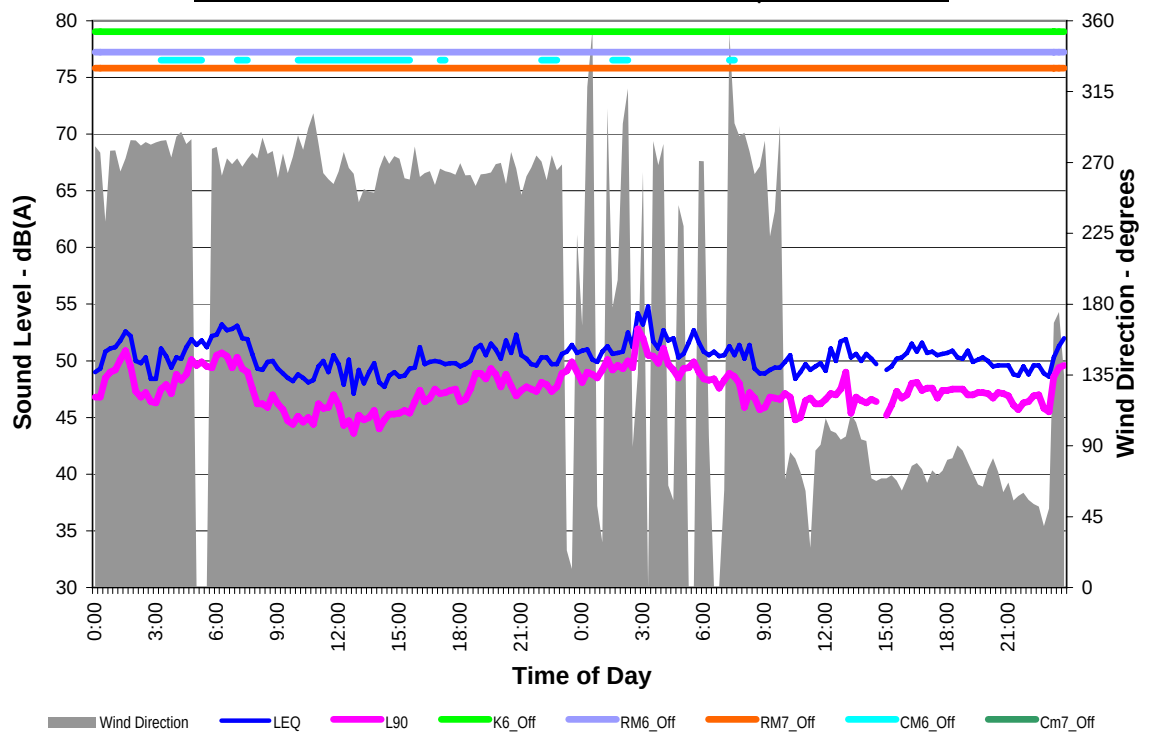
Berrima Cement Works - Ambient - Background Noise Survey

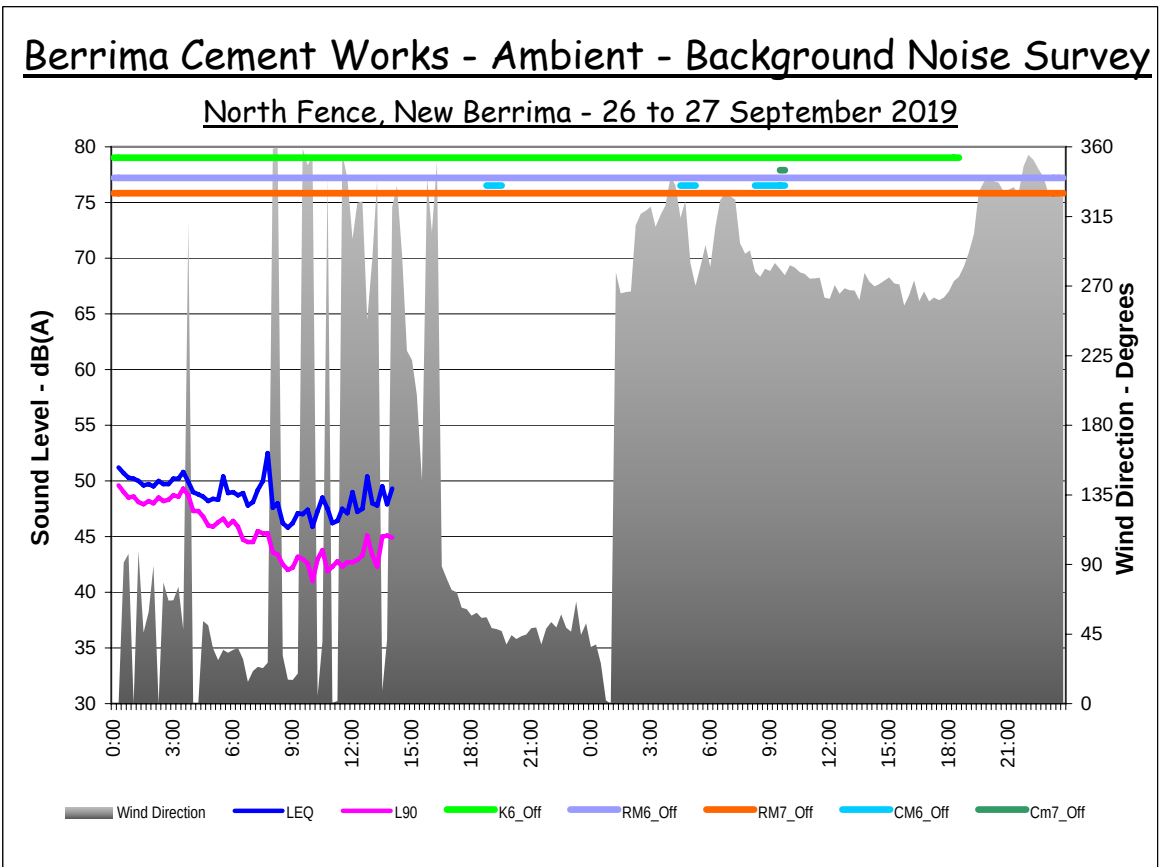
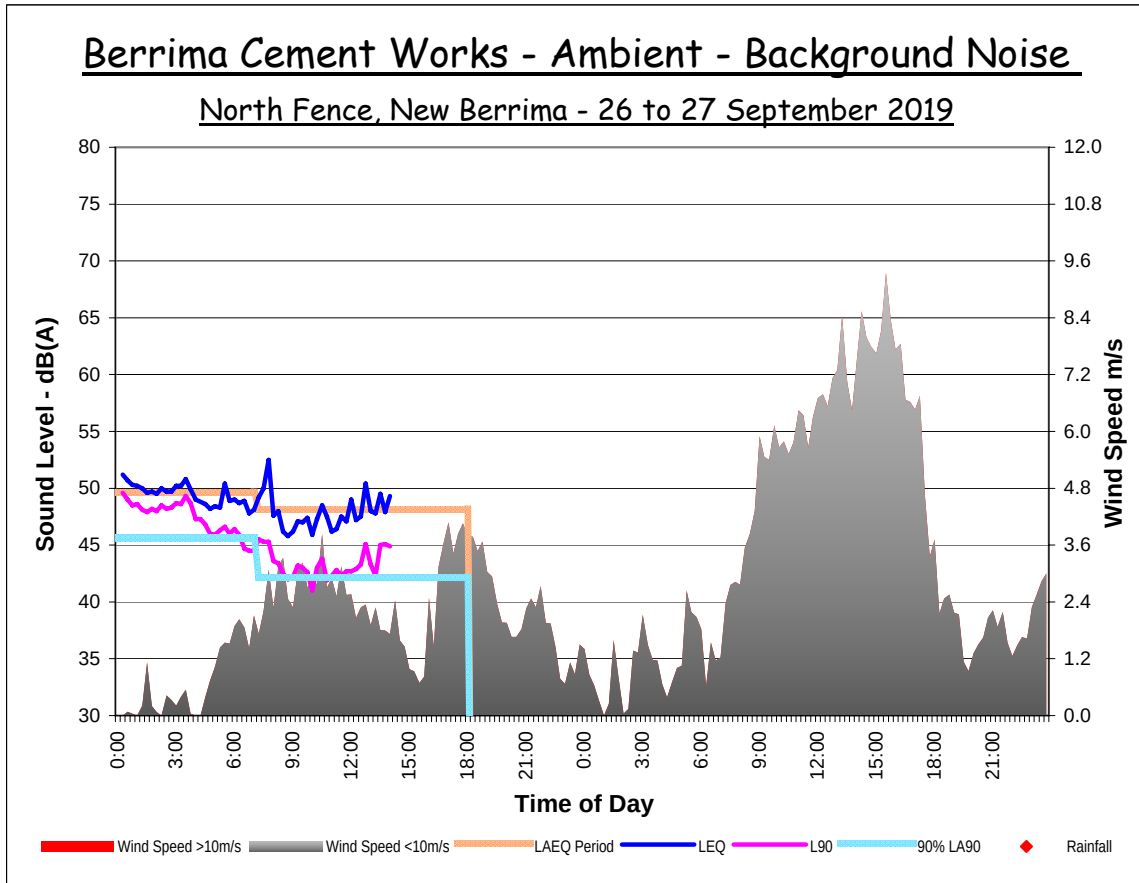
North Fence, New Berrima - 24 to 25 September 2019



Berrima Cement Works - Ambient - Background Noise Survey

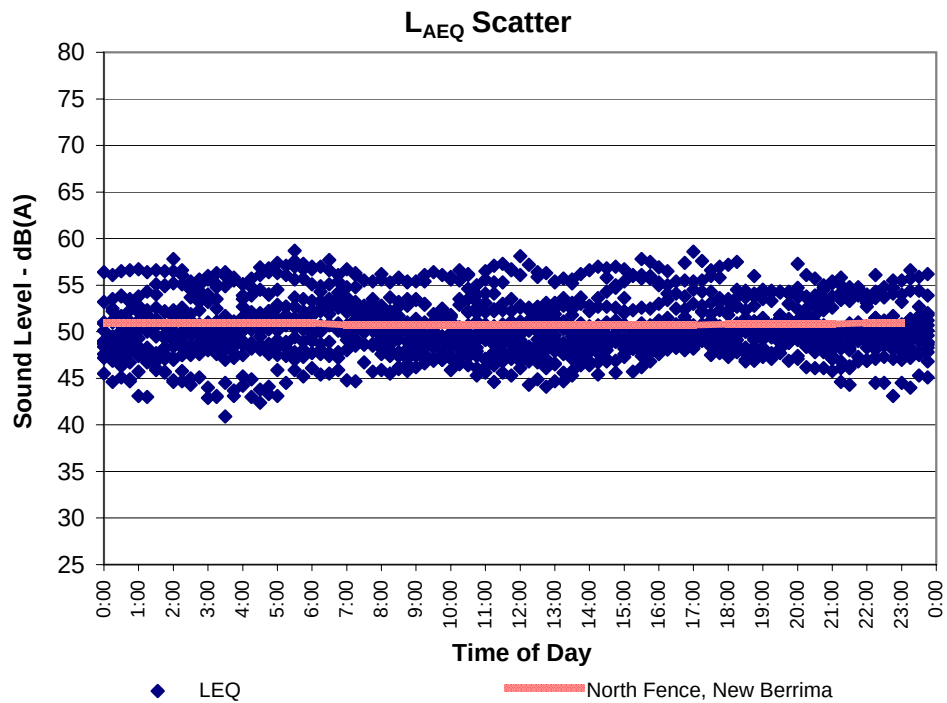
North Fence, New Berrima - 24 to 25 September 2019





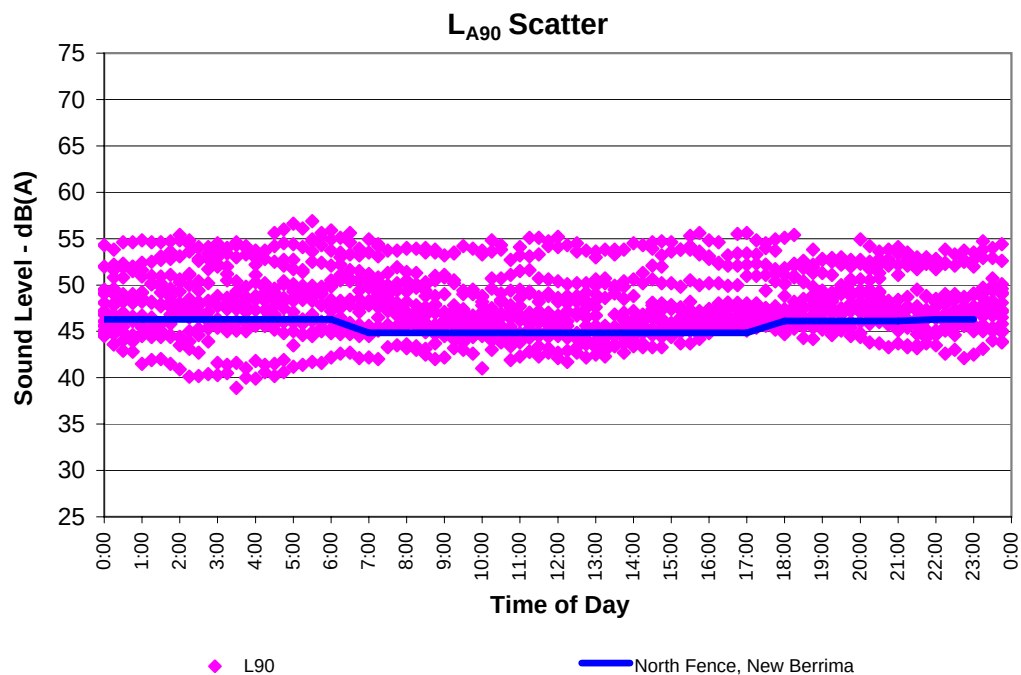
Berrima Cement Works - Ambient - Background Noise

North Fence, New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

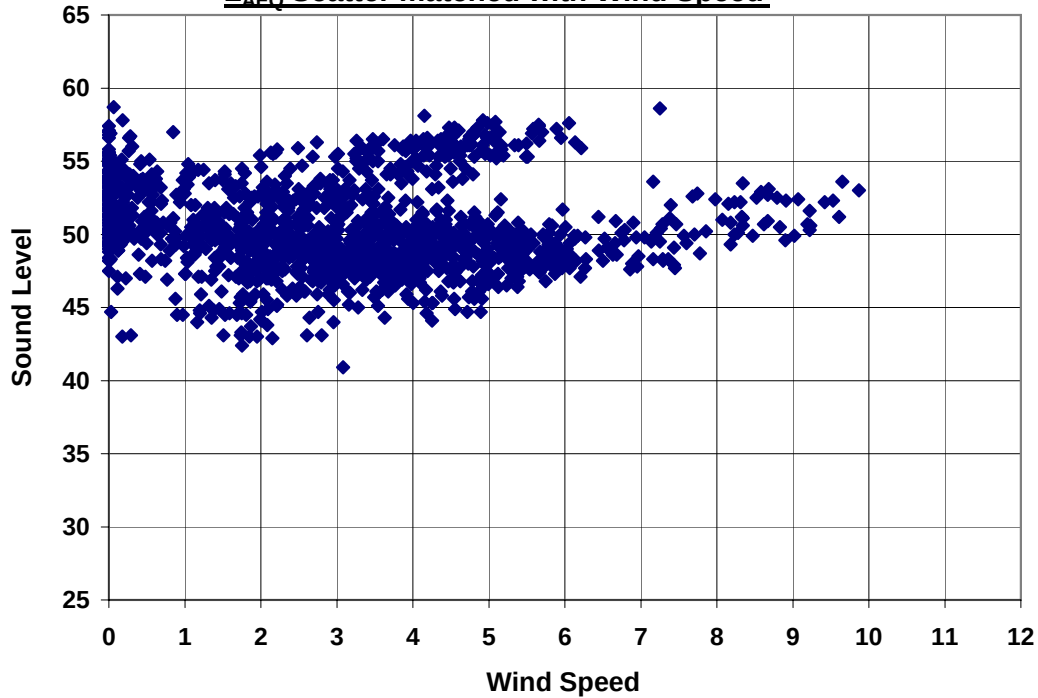
North Fence, New Berrima - 10 September to 2 October 2019



Berrima Cement Works - Ambient - Background Noise

North Fence, New Berrima - 10 September to 2 October 2019

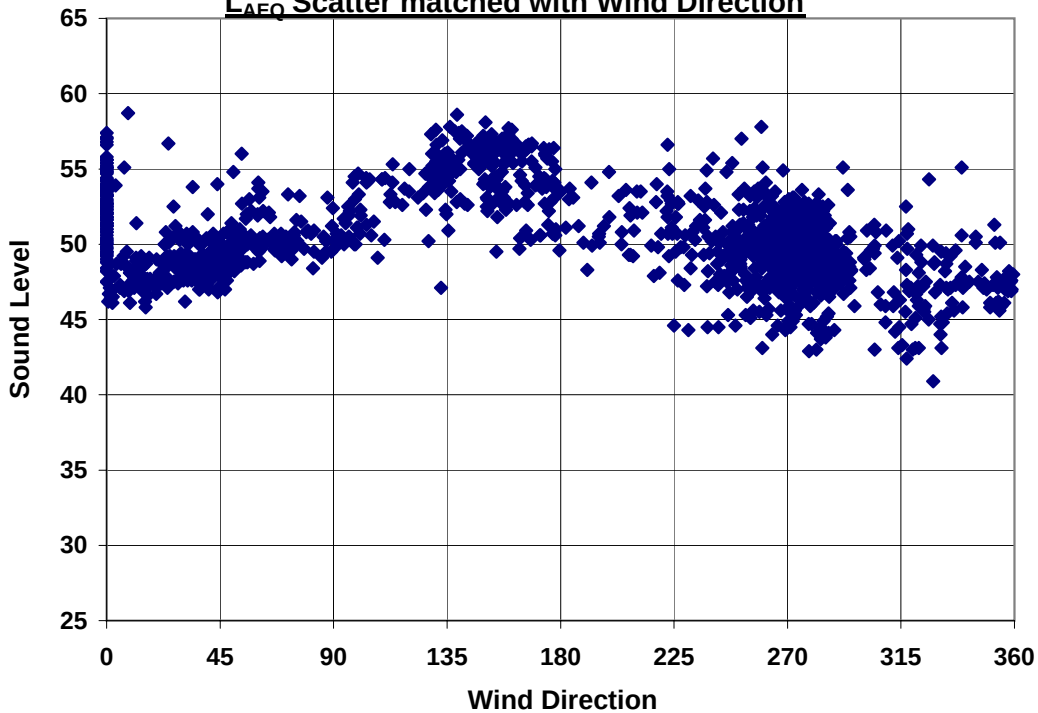
L_{AEQ} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

North Fence, New Berrima - 10 September to 2 October 2019

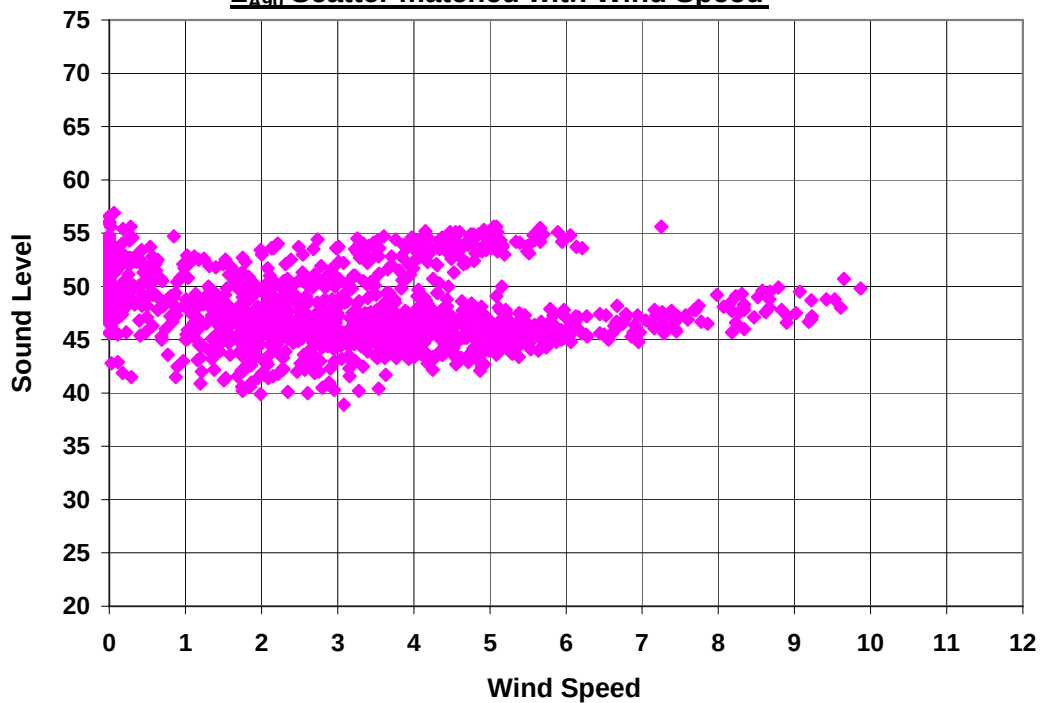
L_{AEQ} Scatter matched with Wind Direction



Berrima Cement Works - Ambient - Background Noise

North Fence, New Berrima - 10 September to 2 October 2019

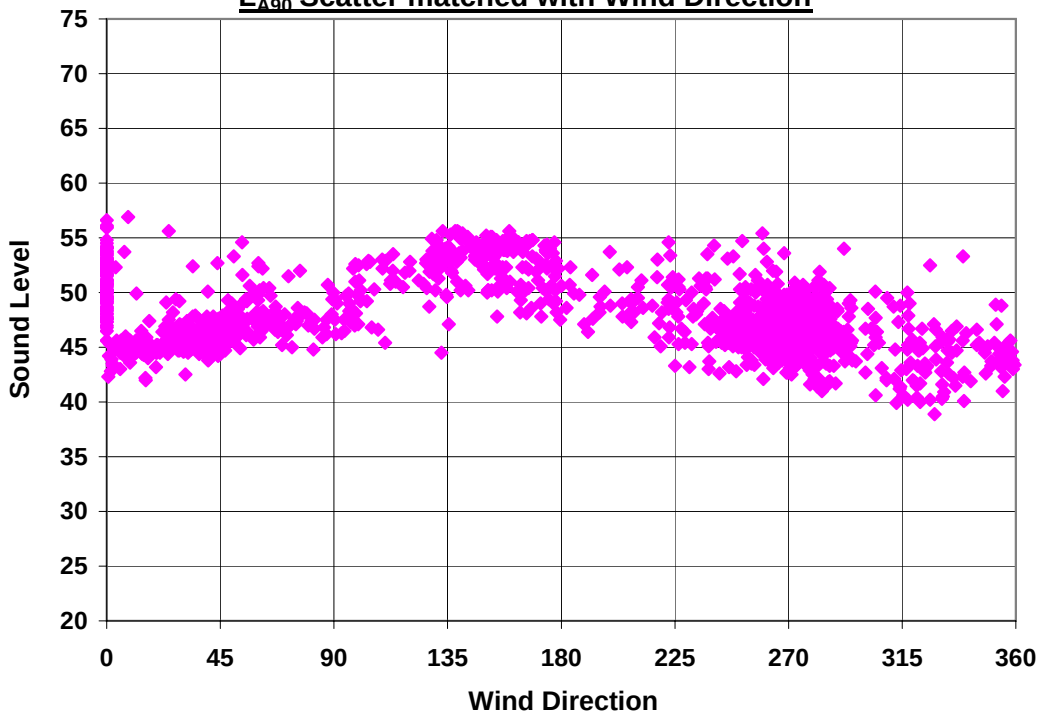
L_{A90} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

North Fence, New Berrima - 10 September to 2 October 2019

L_{A90} Scatter matched with Wind Direction



Appendix G: Unattended environmental sound level results for Store Yard Close

Stock Yard Close, New Berrima
Daytime LAEQ 6 to 19 November 2019

Time	6/11	7/11	8/11	9/11	10/11	11/11	12/11	13/11	14/11	15/11	16/11	17/11	18/11	19/11	Maximum	Minimum	Average	SD
7:00			61	61	63	57	57	60	58	64	57	57	56	59	64	56	59	2.6
7:15			62	60	62	57	58	56	57	65	57	57	55	56	65	55	58	3.0
7:30			63	62	64	56	59	57	55	65	57	57	57	54	65	54	59	3.6
7:45			64	60	64	56	57	61	57	65	57	57	53	55	65	53	59	3.8
8:00			64	58	64	56	59	57	59	67	57	57	54	55	67	54	59	4.0
8:15			64	58	65	58	60	59	59	65	57	57	56	55	65	55	59	3.5
8:30			64	58	65	57	63	56	56	64	57	57	55	59	65	55	59	3.6
8:45			63	59	65	57	62	60	58	64	58	56	55	57	65	55	60	3.3
9:00			65	58	63	58	64	57	58	64	58	58	56	58	65	56	60	3.3
9:15			66	58	62	59	60	59	58	65	58	57	55	59	66	55	60	3.2
9:30			66	59	59	59	63	60	58		57	58	53	56	66	53	59	3.4
9:45			65	61	60	57	62	60	57		56	57	53	57	65	53	59	3.3
10:00			68	59	61	58	62	59	58	68	56	56	56	58	68	56	60	4.1
10:15			67	62	59	59	64	57	59	67	57	56	57	59	67	56	60	3.9
10:30				58	60	59	67	61	57	67	56	57	60	59	67	56	60	3.8
10:45				60	59	59	69	59	58	68	57	57	57	57	69	57	60	4.3
11:00				59	60	59		61	57	65	57	57	61	61	65	57	59	2.4
11:15				61	60	58		61	58	68	58	57	60	63	68	57	60	3.1
11:30				58	63	59		63	60	66	57	57	59	61	66	57	60	2.9
11:45				62	65	61		56	58	64	56	57	60	61	65	56	60	3.0
12:00			69	62	61	62	65	61	60	67	56	57	59	62	69	56	62	3.8
12:15			70	61	59	61	69	62	60	69	57	57	59	61	70	57	62	4.6
12:30				62	58	60	71	65	59	67	56	57	60	61	71	56	61	4.5
12:45				59	60	60	71	59	59		57	57	58	64	71	57	60	4.1
13:00				59	60	60	70	66	58	66	57	57	61		70	57	62	4.4
13:15			69	59	62	61	70	63	59	67	59	59	59		70	59	62	4.2
13:30				62	64	59	71	61	61	70	58	61	58		71	58	62	4.5
13:45			70	60	62	62		63	60		56	62	60		70	56	62	3.7
14:00				64	59	61	69	62	61	68	56	60	60		69	56	62	4.1
14:15		67		62	58	60	69	62	60	68	57	59	55		69	55	62	4.6
14:30				60	60	60	69	65	60	67	57	60	57		69	57	62	4.2
14:45		67		63	60	61	69	62	63	65	63	59	58		69	58	63	3.4
15:00				64	61	62		60	63	69	62	58	57		69	57	62	3.5
15:15		66		62	60	62		63	64	69	63	59	56		69	56	62	3.6
15:30		65	68	64	61	61		62	63	64	62	59	58		68	58	62	2.9
15:45			69	64	60	59	66	62	63	67	62	61	57		69	57	63	3.7
16:00		67	70	63	61	61	68	63	63	68	58	61	59		70	58	64	3.8
16:15			69	63	58	61	66	64	60	66	60	61	59		69	58	62	3.4
16:30	61		70	66	61	63	67	66	60	66	61	60	60		70	60	63	3.4
16:45	62	67	64	67	63	61	69	65	61	65	58	62	59		69	58	63	3.3
17:00	63	67	65	62	64	61	65	66	61	67	58	60	60		67	58	63	2.9
17:15	62			65	62	60	67	63	63	65	57	59	58		67	57	62	3.1
17:30	62	68		63	57	60	67	62	61	64	56	59	58		68	56	61	3.8
17:45	62	66	67	65	57	57	63	62	63	63	57	59	58		67	57	61	3.7
18:00	64	66	61	66	55	58	67	64	61	66	56	56	56		67	55	61	4.7
Max	64	68	70	67	65	63	71	66	64	70	63	62	61	64	71	61	65	3.1
Min	61	65	61	58	55	56	57	56	55	63	56	56	53	54	65	53	57	3.6
Ave	62	67	66	61	61	59	65	61	60	66	58	58	57	59	67	57	61	3.3
SD	0.9	0.8	2.9	2.5	2.4	1.8	4.3	2.7	2.1	1.6	1.9	1.7	2.2	2.6	4.3	0.8	2.2	0.9
E Ave	62	67	67	62	62	60	67	62	60	66	58	58	58	59	67	58	62	3.4

Evening LAEQ

Time	6/11	7/11	8/11	9/11	10/11	11/11	12/11	13/11	14/11	15/11	16/11	17/11	18/11	19/11	Maximum	Minimum	Average	SD
18:00	64	66	61	66	55	58	67	64	61	66	56	56	56		67	55	61	4.7
18:15	58	66	67	65	54	56	67	63	62	67	56	55	58		67	54	61	5.0
18:30	62	65	67	63	54	54	63	62	60	64	56	55	57		67	54	60	4.4
18:45	59	64	67	64	56	56	63	63	61	64	56	57	58		67	56	61	3.8
19:00	57	61	58	64	56	55	64	64	62	61	56	56	56		64	55	59	3.5
19:15	58	62	57	61	57	56	61	61	61	59	56	55	56		62	55	58	2.5
19:30	54	58	60	64	57	55	59	63	62	63	56	55	54		64	54	58	3.7
19:45	54	59	60	62	55	54	60	62	62	56	56	55	53		62	53	58	3.3
20:00	55	56	62	57	55	55	62	62	61	57	56	54	55		62	54	57	3.1
20:15	55	56	60	63	55	56	59	62	61	55	56	55	56		63	55	58	2.9
20:30	55	55	60	62	55	55	61	62	58	55	56	54	55		62	54	57	3.1
20:45	54	58	58	60	52	54	61	60	55	55	56	54	51		61	51	56	3.0
21:00	55	56	56	58	52	53	64	58	54	54	56	53	51		64	51	55	3.2
21:15	54	58	56	59	55	53	57	61	54	55	56	54	51		61	51	56	2.7
21:30	54	57	55	59	55	53	56	63	54	55	56	53	54		63	53	56	2.7
21:45	54	56	56	60	55	52	55	63	54	55	56	52	55		63	52	56	3.0
22:00	54	56	56	65	56	53	57	61	54	55	56	54	55		65	53	56	3.3
Max	64	66	67	66	57	58	67	64	62	67	56	57	58		67	56	62	4.3
Min	54	55	55	57	52	52	55	58	54	54	56	52	51		58	51	54	2.0
Ave	56	59	60	62	55	55	61	62	59	58	56	55	55		62	55	58	2.8
SD	3.1	3.7	4.0	2.6	1.3	1.6	3.5	1.5	3.5	4.5	0.3	1.2	2.0		4.5	0.3	2.5	1.3
E Avg	58	61	62	63	55	55	62	62	60	61	56	55	55		63	55	59	3.2

Night LAEQ

Time	6/11	7/11	8/11	9/11	10/11	11/11	12/11	13/11	14/11	15/11	16/11	17/11	18/11	19/11	Maximum	Minimum	Average	SD
22:00	54	56	56	65	56	53	57	61	54	55	56	54	55		65	53	56	3.3
22:15	54	56	56	64	56	54	52	61	55	55	56	51	55		64	51	56	3.4
22:30	54	58	56	62	54	55	52	62	55	55	56	52	56		62	52	56	3.2
22:45	53	58	57	63	52	56	52	58	55	55	56	51	56		63	51	55	3.1
23:00	54	57	56	59	54	53	52	61	55	55	56	51	55		61	51	55	2.7
23:15	54	61	58	61	54	53	52	60	55	55	55	51	56		61	51	56	3.3
23:30	55	60	57	59	54	53	51	58	55	55	55	50	56		60	50	55	2.8
23:45	54	59	56	64	54	53	52	57	55	56	56	51	54		64	51	55	3.3
0:00	53	56	57	63	54	53	55	55	55	57	56	52	54		63	52	55	2.9
0:15	54	58	57	57	54	53	52	55	55	57	55	52	54		58	52	55	1.8
0:30	55	60	56	59	54	53	51	55	55	57	55	53	54		60	51	55	2.5
0:45	55	62	56	63	54	53	51	55	55	57	56	52	54		63	51	56	3.4
1:00	57	61	56	60	54	52	52	55	56	57	55	53	54		61	52	56	2.7
1:15	56	61	56	61	54	52	52	55	56	58	55	53	55		61	52	56	2.8
1:30	56	63	57	59	54	52	52	55	56	57	55	52	56		63	52	56	3.1
1:45	57	62	58	59	54	52	54	55	55	57	56	52	55		62	52	56	2.7
2:00	61	62	58	60	54	53	55	55	55	57	56	51	55		62	51	56	3.0
2:15	59	64	57	60	56	53	53	55	55	57	55	56	55		64	53	57	2.9
2:30	61	63	56	58	55	53	61	55	55	57	55	53	55		63	53	57	3.2
2:45	63	63	57	53	55	53	52	55	55	57	56	51	54		63	51	56	3.7
3:00	65	63	57	54	55	53	52	55	57	57	56	52	55		65	52	56	4.0
3:15	65	63	57	57	55	53	52	55	56	57	56	52	55		65	52	56	3.9
3:30	65	62	57	56	57	53	55	57	57	56	51	55	55		65	51	57	3.8
3:45	64	61	55	64	56	54	51	56	58	57	56	52	57		64	51	57	4.0
4:00	70	62	55	65	56	53	51	55	61	57	56	52	56		70	51	58	5.3
4:15	67	62	56	65	56	54	53	57	60	55	56	52	57		67	52	58	4.7
4:30		64	58	64	57	54	59	56	65	53	57	51	57		65	51	58	4.4
4:45		63	60	64	56	57	56	56	62	56	56	53	56		64	53	58	3.4
5:00	66	62	56	66	56	58	58	58	63	59	57	54	56		66	54	59	3.9
5:15	67	61	55	63	56	55	58	58	63	58	57	55	55		67	55	58	3.9
5:30		62	58	64	58	56	59	57	64	58	57	57	56		64	56	59	2.9
5:45	67	60	55	65	59	58	57	55	63	57	58	54	55		67	54	59	3.9
6:00	67	59	55	65	57	56	57	56	61	57	57	51	59		67	51	58	4.1
6:15	67	61	56	62	57	55	57	58	61	57	57	54	57		67	54	58	3.5
6:30	65	60	55	65	57	58	60	59	65	56	57	55	57		65	55	59	3.6
6:45		60	61	63	58	57	58	58	64	57	57	54	60		64	54	59	2.8
7:00		61	61	63	57	57	60	58	64	57	57	56	59		64	56	59	2.6
Max	70	64	61	66	59	58	61	62	65	59	58	57	60		66	57	61	2.8
Min	53	56	55	53	52	52	51	55	54	53	55	50	54		56	50	53	1.8
Ave	60	61	57	62	55	54	54	57	58	56	56	53	56		62	53	56	2.6
SD	5.6	2.2	1.4	3.2	1.5	1.9	3.0	2.1	3.7	1.1	0.7	1.6	1.4		3.7	0.7	2.0	0.9
E Avg	63	61	57	63	55	55	55	57	60	57	56	53	56		63	53	57	2.8
24hr	58	64	64	61	61	58	64	61	59	64	57	57	56	58	64	56	60	2.9

Stock Yard Close, New Berrima
Daytime LA90 6 to 19 November 2019

Time	6/11	7/11	8/11	9/11	10/11	11/11	12/11	13/11	14/11	15/11	16/11	17/11	18/11	19/11	Maximum	Minimum	Average	SD
7:00			53	54	52	55	54	52	54	55	55	56	51	54	56	51	54	1.5
7:15			54	54	52	54	53	52	53	54	56	55	50	53	56	50	53	1.5
7:30			55	54	52	54	54	52	53	54	56	56	50	53	56	50	54	1.6
7:45			55	54	52	55	52	53	53	54	56	56	50	53	56	50	53	1.6
8:00			55	54	54	54	54	52	54	56	55	56	52	53	56	52	54	1.4
8:15			55	54	54	54	54	52	54	55	56	55	52	52	56	52	54	1.3
8:30			56	53	55	53	54	52	54	54	56	55	52	53	56	52	54	1.4
8:45			55	54	55	53	53	51	54	54	56	55	52	53	56	51	54	1.4
9:00			56	53	54	54	52	51	54	54	55	55	51	53	56	51	53	1.5
9:15			56	53	54	54	52	51	53	54	55	55	50	54	56	50	53	1.6
9:30			55	54	53	53	52	51	54		55	55	50	53	55	50	53	1.6
9:45			55	55	53	52	52	51	53		55	55	51	52	55	51	53	1.6
10:00			56	55	54	53	52	51	53	55	55	55	51	53	56	51	53	1.5
10:15			56	55	53	53	53	52	54	54	55	54	51	53	56	51	54	1.5
10:30				55	54	54	53	51	54	54	54	55	51	53	55	51	53	1.2
10:45				55	53	55	54	51	54	54	54	55	51	53	55	51	53	1.6
11:00				55	53	53		50	55	54	55	55	53	54	55	50	54	1.4
11:15				55	54	55		50	54	54	55	54	53	54	55	50	54	1.4
11:30				54	55	55		51	54	53	55	54	53	53	55	51	54	1.2
11:45				55	54	53		50	54	53	54	54	53	51	55	50	53	1.5
12:00			58	55	54	53	53	51	53	54	53	55	51	53	58	51	53	1.9
12:15			59	54	53	53	55	51	53	54	54	54	51	52	59	51	54	2.0
12:30				54	53	53	56	51	53	54	53	54	51	54	56	51	53	1.4
12:45				53	54	53	57	51	53		53	55	50	54	57	50	53	1.7
13:00				53	54	56	54	53	52	54	53	54	52		56	52	54	1.1
13:15			56	53	54	53	54	51	53	54	53	54	51		56	51	53	1.5
13:30				53	54	52	57	51	53	57	53	55	50		57	50	53	2.2
13:45			57	54	54	52		50	54		53	55	51		57	50	53	2.1
14:00				54	53	53	54	51	53	55	53	54	50		55	50	53	1.5
14:15		55		54	54	53	53	51	51	53	53	54	50		55	50	53	1.6
14:30				54	54	52	52	51	52	54	54	54	51		54	51	53	1.5
14:45		57		55	53	52	53	51	52	54	55	54	51		57	51	53	1.8
15:00				54	54	52		51	52	54	55	54	50		55	50	53	1.6
15:15		55		54	53	52		51	52	56	55	55	50		56	50	53	2.0
15:30		55	56	54	53	52		50	51	54	55	54	51		56	50	53	1.9
15:45			55	55	53	53	52	51	50	51	52	54	50		56	50	52	2.0
16:00		55	58	53	54	53	54	51	51	52	54	55	52		58	51	53	2.0
16:15			58	53	53	52	52	52	51	52	53	54	53		58	51	53	1.8
16:30	53		55	54	54	52	51	51	51	53	53	55	52		55	51	53	1.4
16:45	55	55	54	55	53	52	53	51	51	53	53	56	52		56	51	53	1.4
17:00	55	55	53	53	54	53	50	52	51	53	53	55	52		55	50	53	1.5
17:15	53			54	54	52	51	50	52	54	53	55	52		55	50	53	1.5
17:30	53	57		53	53	52	52	50	51	53	53	54	52		57	50	53	1.9
17:45	53	55	54	54	53	51	49	50	52	52	53	54	52		55	49	52	1.8
18:00	53	56	52	53	52	51	51	50	52	53	53	53	52		56	50	52	1.4
Max	55	57	59	55	55	56	57	53	55	57	56	56	53	54	59	53	56	1.5
Min	53	55	52	53	52	51	49	50	51	52	53	53	50	51	55	49	52	1.5
Ave	54	55	55	54	53	53	53	51	53	54	54	55	51	53	55	51	53	1.3
SD	0.8	0.8	1.6	0.6	0.7	1.1	1.7	0.8	1.2	1.0	1.1	0.6	0.9	0.7	1.7	0.6	1.0	0.3
90%	53	55	53	53	52	52	51	50	51	53	53	54	50	52	55	50	52	1.4
																Median	53	

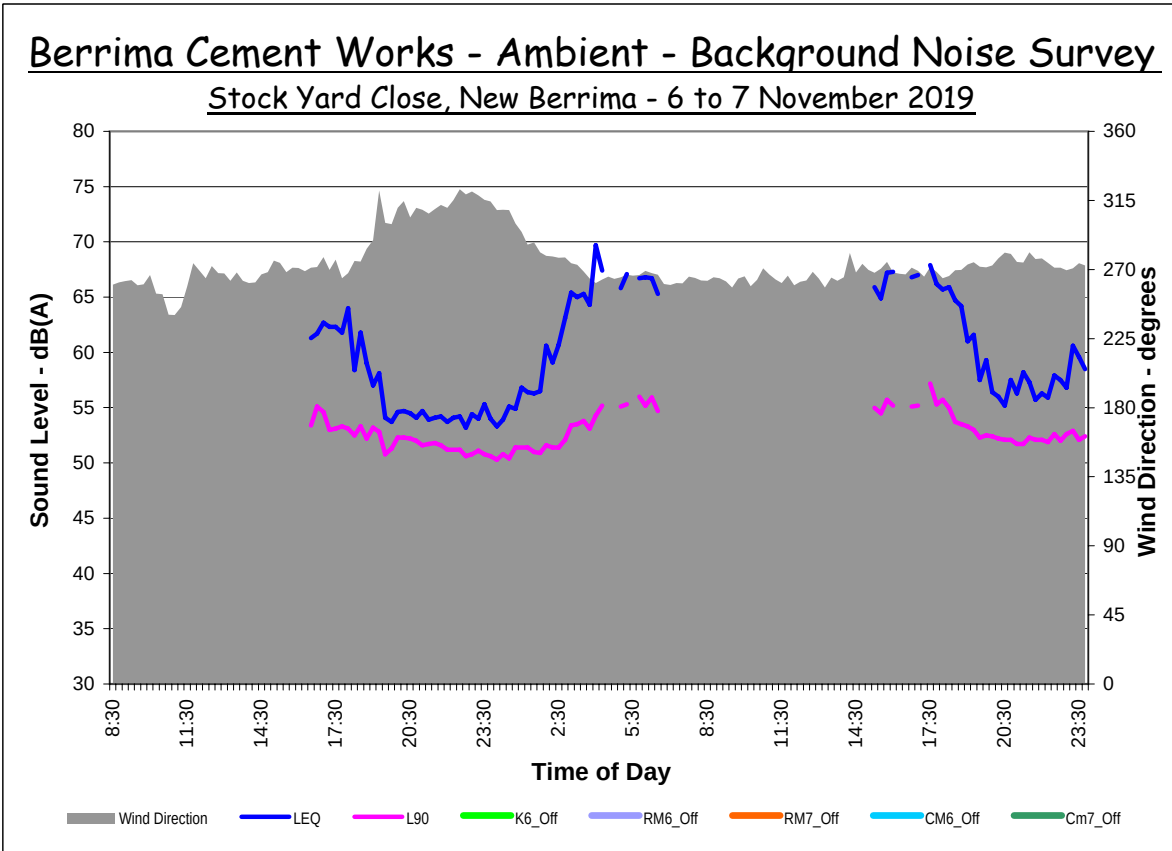
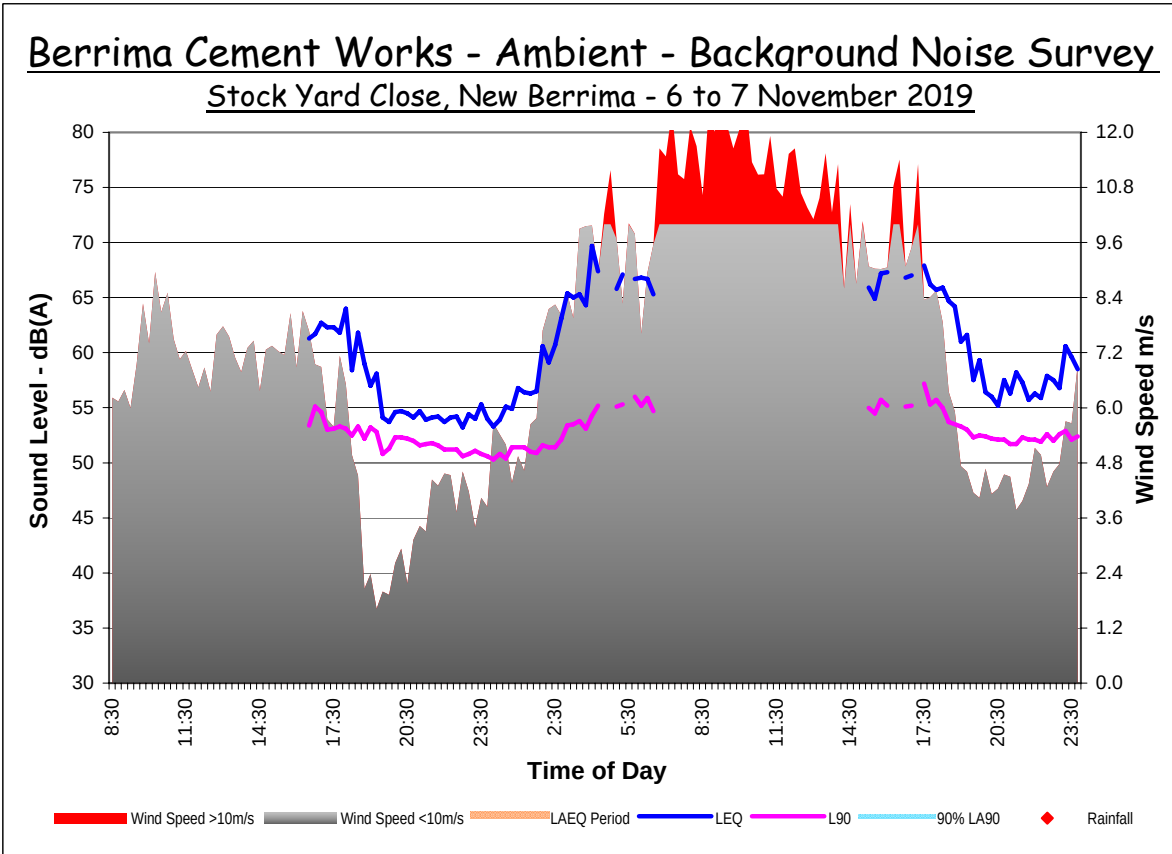
Evening LA90

Time	6/11	7/11	8/11	9/11	10/11	11/11	12/11	13/11	14/11	15/11	16/11	17/11	18/11	19/11	Maximum	Minimum	Average	SD
18:00	53	56	52	53	52	51	51	50	52	53	53	53	52		56	50	52	1.4
18:15	53	55	53	53	51	51	51	50	51	54	53	52	52		55	50	52	1.6
18:30	53	54	53	54	51	51	49	50	51	53	53	53	52		54	49	52	1.5
18:45	52	54	53	55	53	52	50	50	52	54	54	53	52		55	50	52	1.5
19:00	53	53	53	54	53	52	52	51	51	52	53	52	52		54	51	52	0.9
19:15	53	53	52	54	53	51	51	51	52	51	54	52	52		54	51	52	1.0
19:30	51	52	53	53	53	52	50	51	52	52	54	53	51		54	50	52	1.1
19:45	51	53	53	52	52	53	51	51	52	52	54	53	51		54	51	52	0.9
20:00	52	52	53	52	52	52	51	51	52	52	53	52	52		53	51	52	0.7
20:15	52	52	52	52	53	52	52	53	52	52	53	53	52		53	52	52	0.5
20:30	52	52	52	54	53	53	50	53	51	52	54	53	51		54	50	52	1.1
20:45	52	52	52	53	51	52	51	53	51	53	54	53	50		54	50	52	1.1
21:00	52	52	53	52	51	52	51	52	51	52	54	52	50		54	50	52	0.9
21:15	52	52	53	52	52	52	51	53	51	53	54	52	50		54	50	52	1.0
21:30	52	52	53	53	53	52	50	53	51	53	55	51	51		55	50	52	1.1
21:45	52	52	53	53	53	51	50	53	51	52	55	51	52		55	50	52	1.3
22:00	51	52	53	53	53	51	50	53	52	53	55	51	52		55	50	52	1.2
Max	53	56	53	55	53	53	52	53	52	54	55	53	52		56	52	53	1.2
Min	51	52	52	52	51	51	49	50	51	51	53	51	50		53	49	51	1.0
Ave	52	53	53	53	52	52	51	52	51	53	54	52	51		54	51	52	0.8
SD	0.7	1.1	0.5	0.9	0.8	0.6	0.6	1.2	0.4	0.6	0.5	0.6	0.8		1.2	0.4	0.7	0.2
90%	51	52	52	52	51	51	50	50	51	52	53	51	50		53	50	51	0.9
																Median	51	

Night LA90

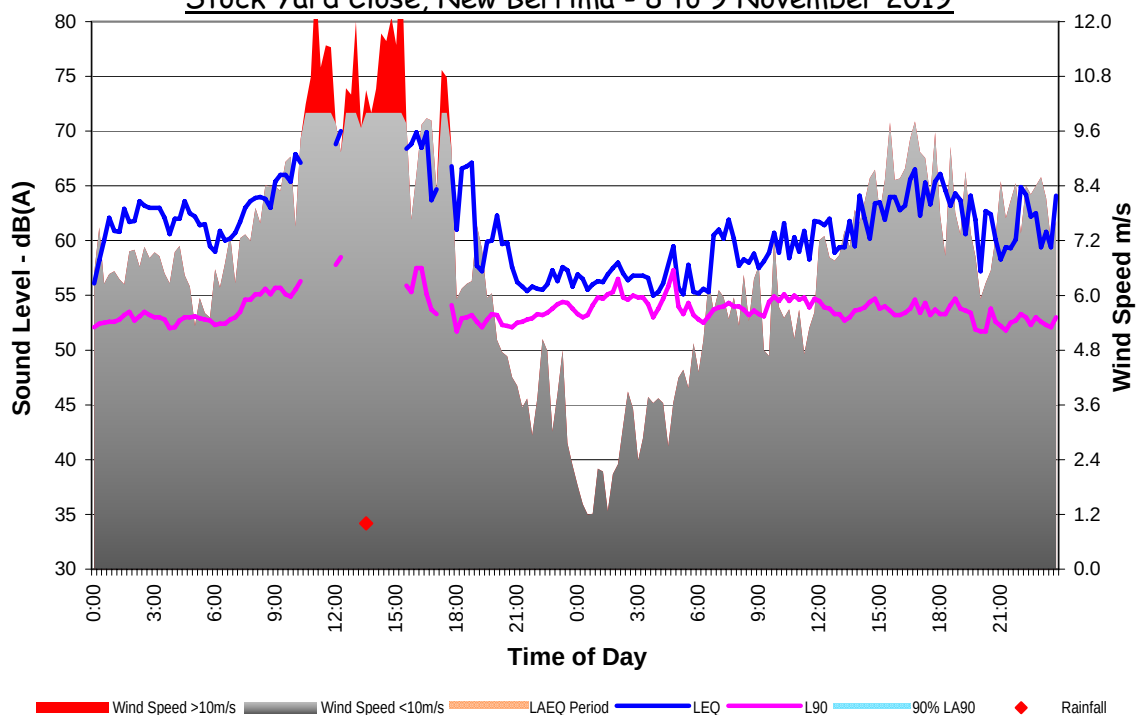
Time	6/11	7/11	8/11	9/11	10/11	11/11	12/11	13/11	14/11	15/11	16/11	17/11	18/11	19/11	Maximum	Minimum	Average	SD
22:00	51	52	53	53	53	51	50	53	52	53	55	51	52		55	50	52	1.2
22:15	51	52	53	53	53	52	51	53	52	53	54	50	52		54	50	52	1.1
22:30	51	53	53	52	53	52	51	53	52	52	54	50	53		54	50	52	1.1
22:45	51	52	54	53	51	51	51	53	52	52	54	50	53		54	50	52	1.3
23:00	51	53	54	53	50	51	51	53	53	53	53	50	53		54	50	52	1.3
23:15	51	53	54	52	52	51	51	53	53	53	54	50	54		54	50	52	1.4
23:30	51	52	54	52	53	51	51	53	53	54	53	50	54		54	50	52	1.5
23:45	51	52	54	53	53	50	52	53	53	54	54	50	53		54	50	52	1.3
0:00	50	52	53	52	52	51	52	53	53	55	53	50	53		55	50	52	1.2
0:15	51	52	53	52	53	52	51	53	53	55	53	51	52		55	51	52	1.1
0:30	50	53	53	51	53	51	50	53	52	55	53	51	52		55	50	52	1.3
0:45	51	53	54	52	53	51	50	53	52	55	53	51	53		55	50	52	1.3
1:00	51	53	55	52	53	50	51	53	53	55	53	51	53		55	50	53	1.4
1:15	51	53	55	52	53	51	51	53	53	56	53	51	53		56	51	53	1.5
1:30	51	53	55	51	53	50	51	53	53	56	54	51	54		56	50	53	1.7
1:45	51	54	55	51	52	51	51	53	53	56	54	51	53		56	51	53	1.7
2:00	52	53	57	51	52	51	51	53	52	55	54	50	53		57	50	53	1.9
2:15	51	53	55	51	54	51	51	53	52	55	54	51	53		55	51	53	1.6
2:30	51	54	55	51	54	51	51	53	52	55	54	51	53		55	51	53	1.6
2:45	52	53	55	50	54	51	50	52	52	55	55	50	53		55	50	53	1.9
3:00	53	53	55	51	53	51	50	53	52	55	55	51	53		55	50	53	1.8
3:15	54	53	55	51	53	50	49	53	52	55	55	50	53		55	49	53	1.9
3:30	54	53	54		54	51	50	53	52	56	55	50	53		56	50	53	1.9
3:45	53	52	53	52	54	51	50	53	53	55	55	50	54		55	50	53	1.7
4:00	54	52	54	53	55	51	50	53	53	56	54	50	54		56	50	53	1.8
4:15	55	53	55	53	55	51	50	53	53	52	55	50	54		55	50	53	1.8
4:30		53	56	52	55	51	51	53	54	52	56	50	53		56	50	53	2.0
4:45		53	57	54	55	54	51	54	54	52	55	50	53		57	50	53	2.0
5:00		55	53	54	53	55	54	52	55	55	56	55	50	53		56	50	54
5:15	55	53	53	53	54	52	51	55	54	56	56	50	53		56	50	53	1.8
5:30		53	54	53	54	53	51	54	55	56	56	50	52		56	50	53	1.8
5:45	56	53	53	53	54	53	51	53	54	56	56	50	52		56	50	53	1.7
6:00	55	52	53	53	53	52	51	54	54	56	55	50	53		56	50	53	1.7
6:15	56	52	53	52	53	52	51	54	54	55	55	50	53		55	50	53	1.6
6:30	55	52	53	54	54	51	51	54	54	55	56	50	53		56	50	53	1.7
6:45		53	54	52	54	52	51	54	55	55	56	50	55		56	50	53	1.8
7:00		53	54	52	55	54	52	54	55	55	56	51	54		56	51	54	1.5
Max	56	54	57	54	55	54	52	55	55	56	56	51	55		57	51	55	1.7
Min	50	52	53	50	50	50	49	52	52	52	53	50	52		53	49	51	1.3
Ave	52	53	54	52	53	51	51	53	53	55	54	50	53		55	50	53	1.3
SD	1.9	0.4	1.0	0.9	1.1	1.0	0.7	0.6	1.0	1.4	0.9	0.5	0.6		1.9	0.4	0.9	0.4
90%	51	52	53	51	52	50	50	53	52	52	53	50	52		53	50	52	1.2
																Median	52	

Two Day Results of Ambient Noise Monitoring



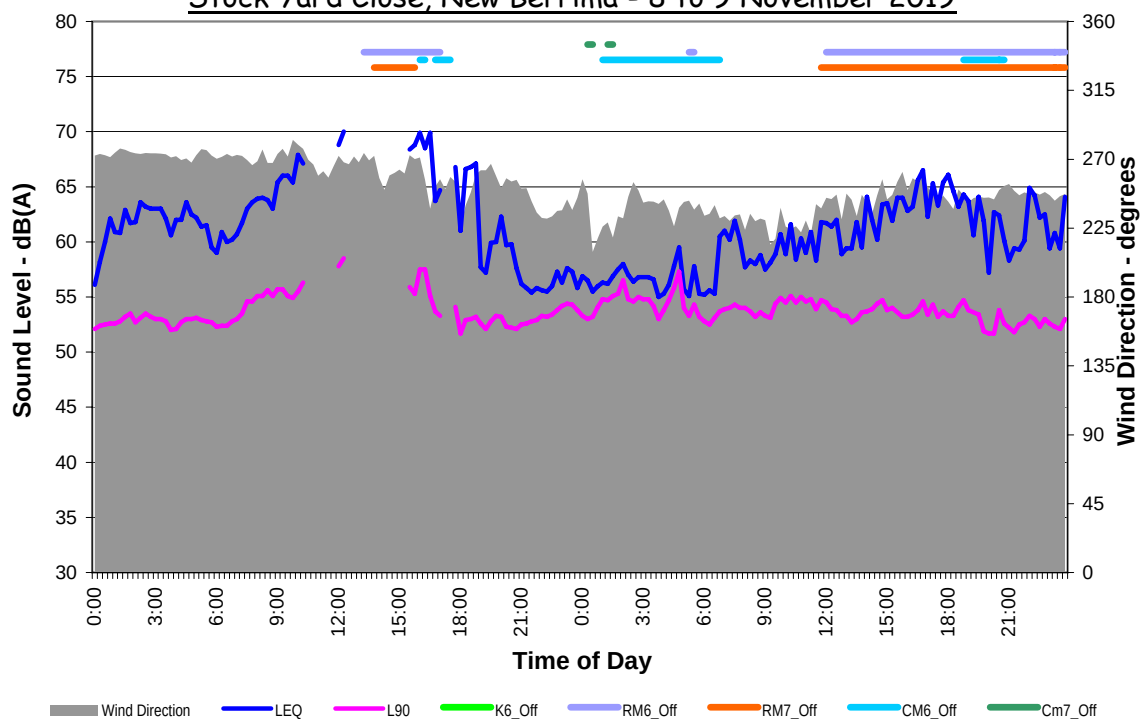
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close, New Berrima - 8 to 9 November 2019



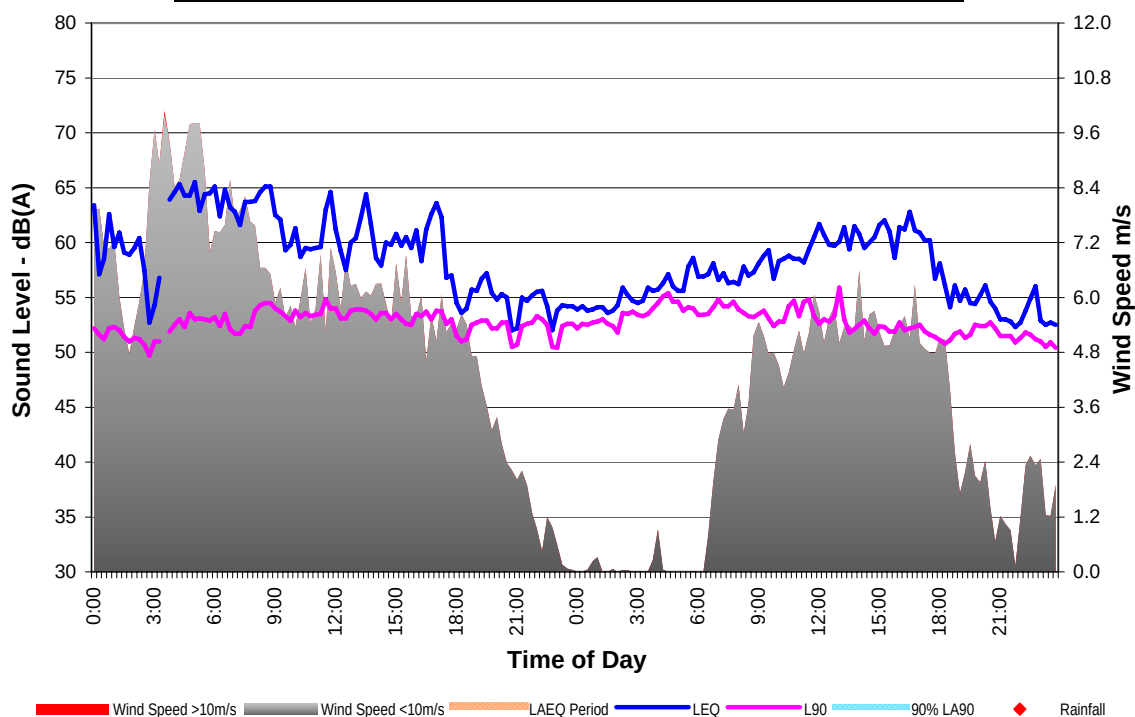
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close, New Berrima - 8 to 9 November 2019



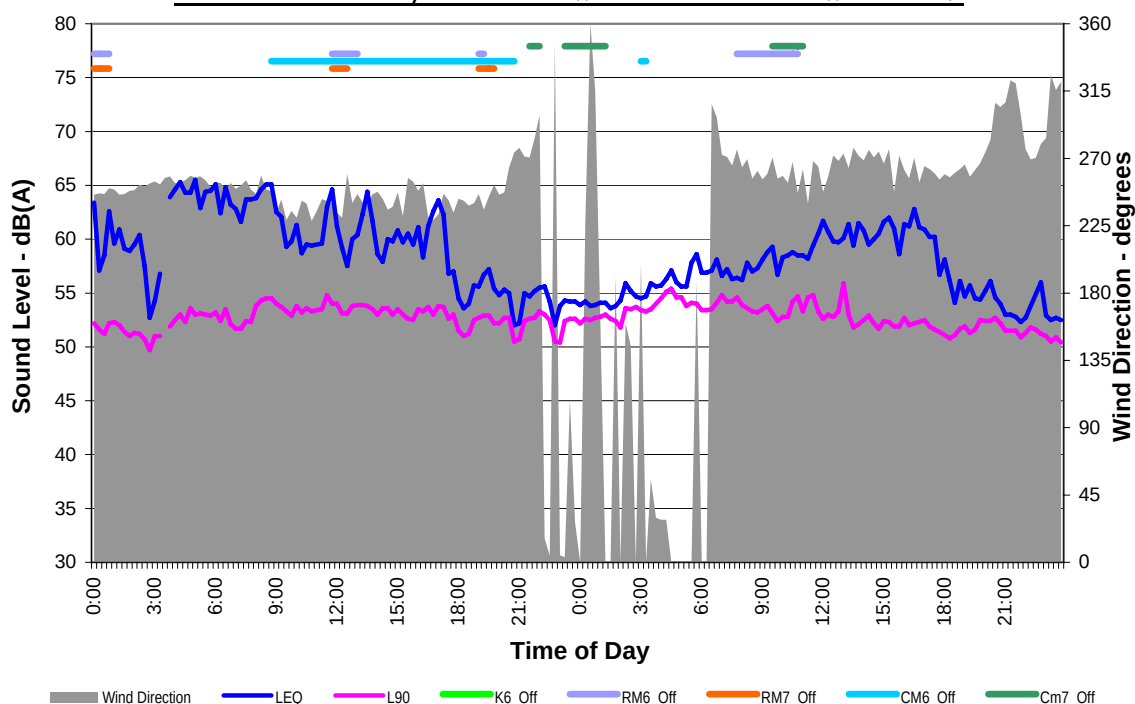
Berrima Cement Works - Ambient - Background Noise Survey

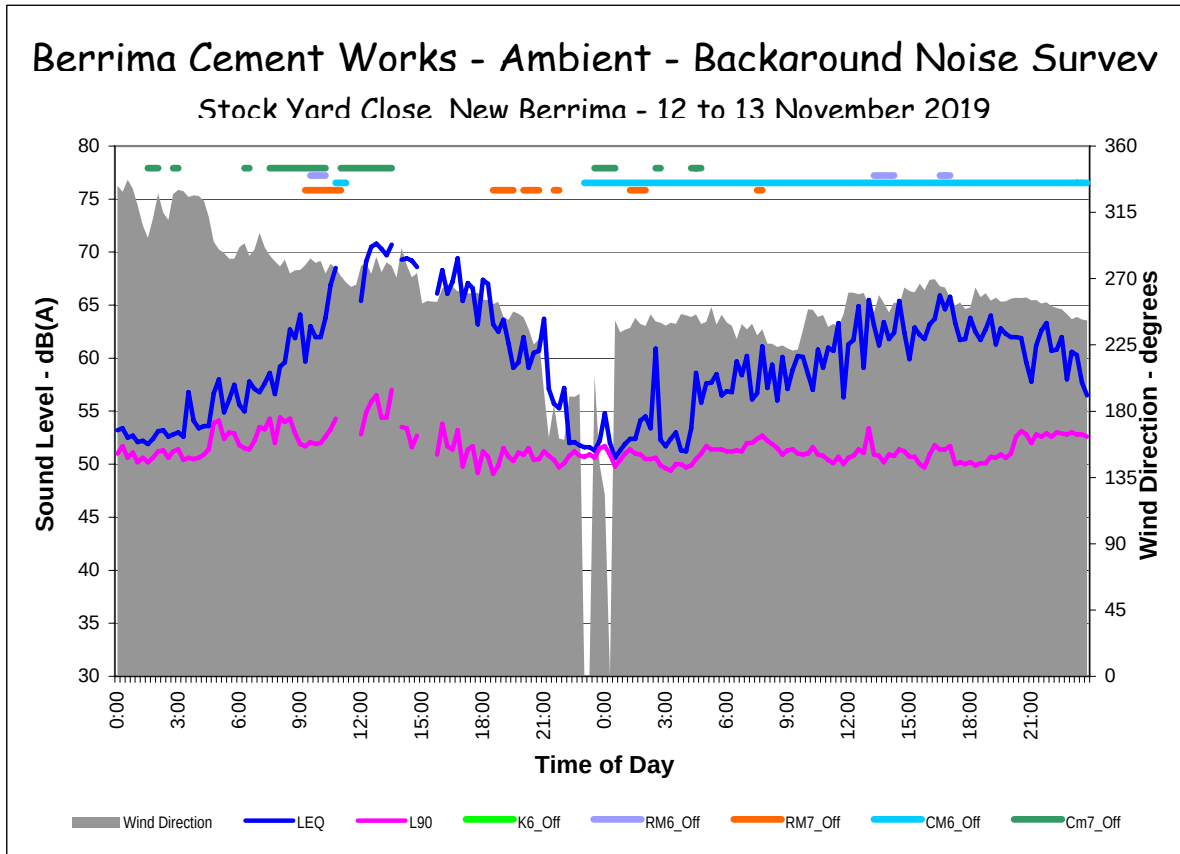
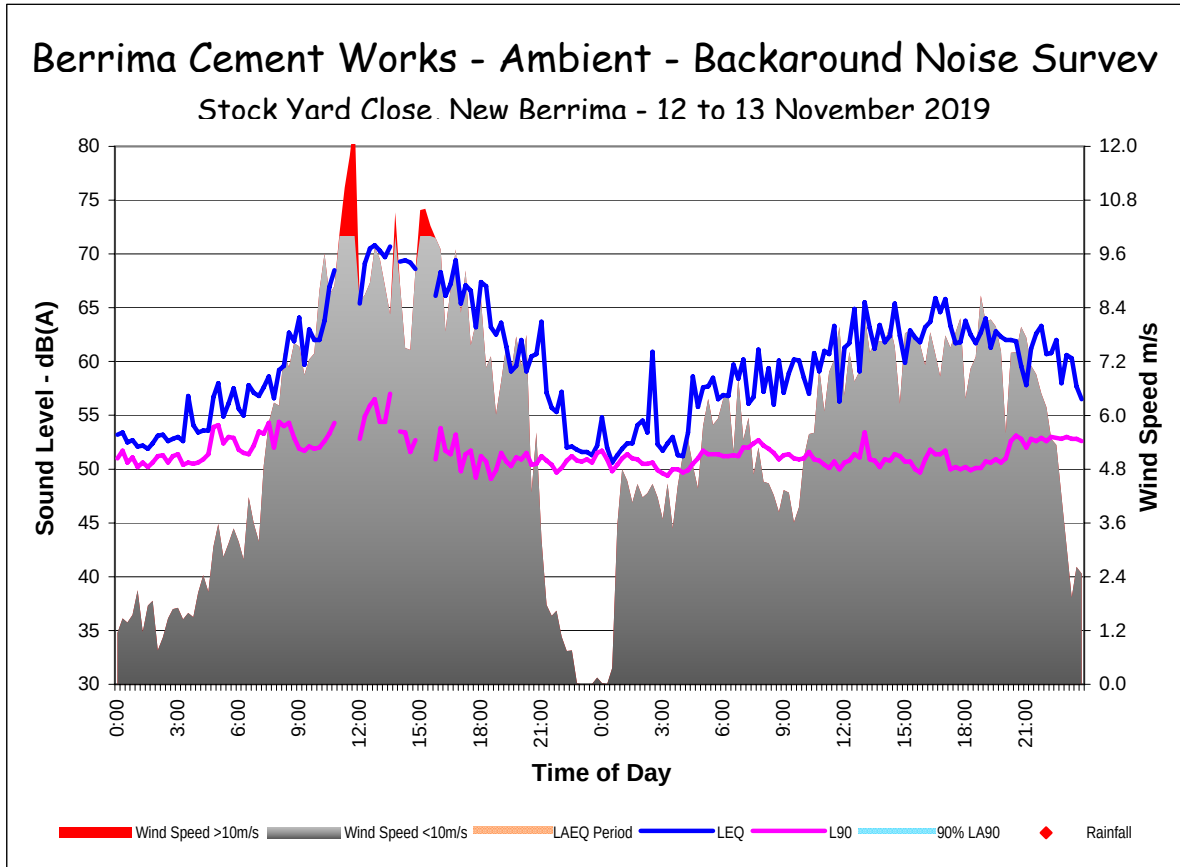
Stock Yard Close, New Berrima - 10 to 11 November 2019



Berrima Cement Works - Ambient - Background Noise Survey

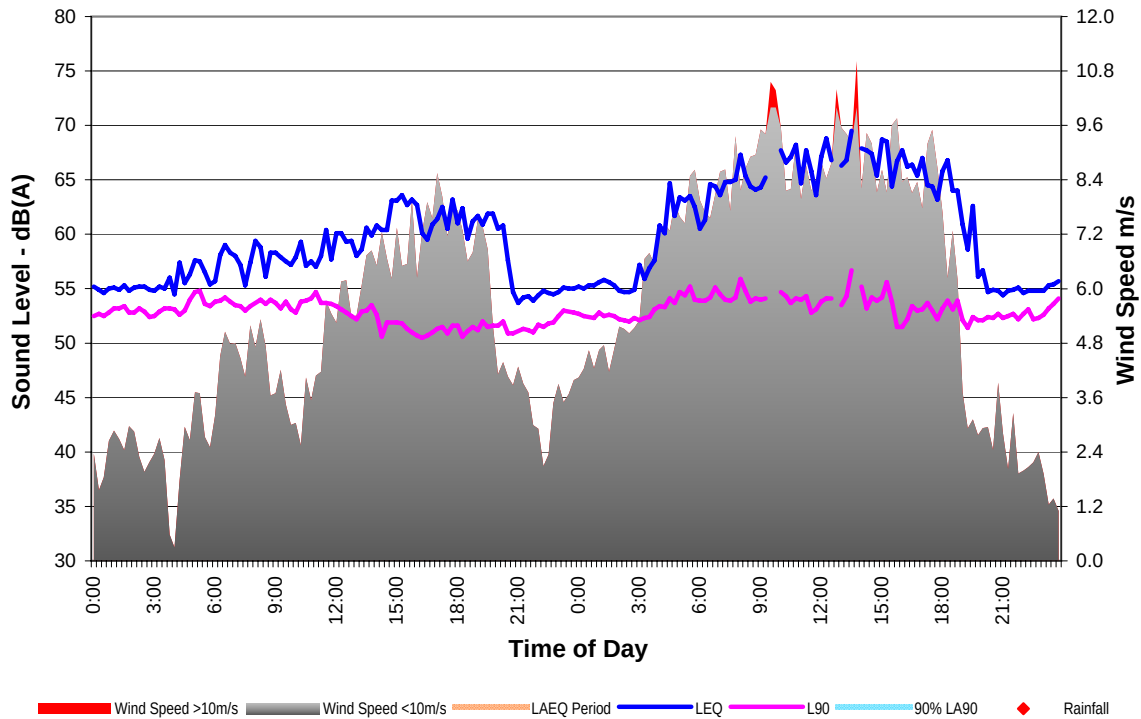
Stock Yard Close, New Berrima - 10 to 11 November 2019





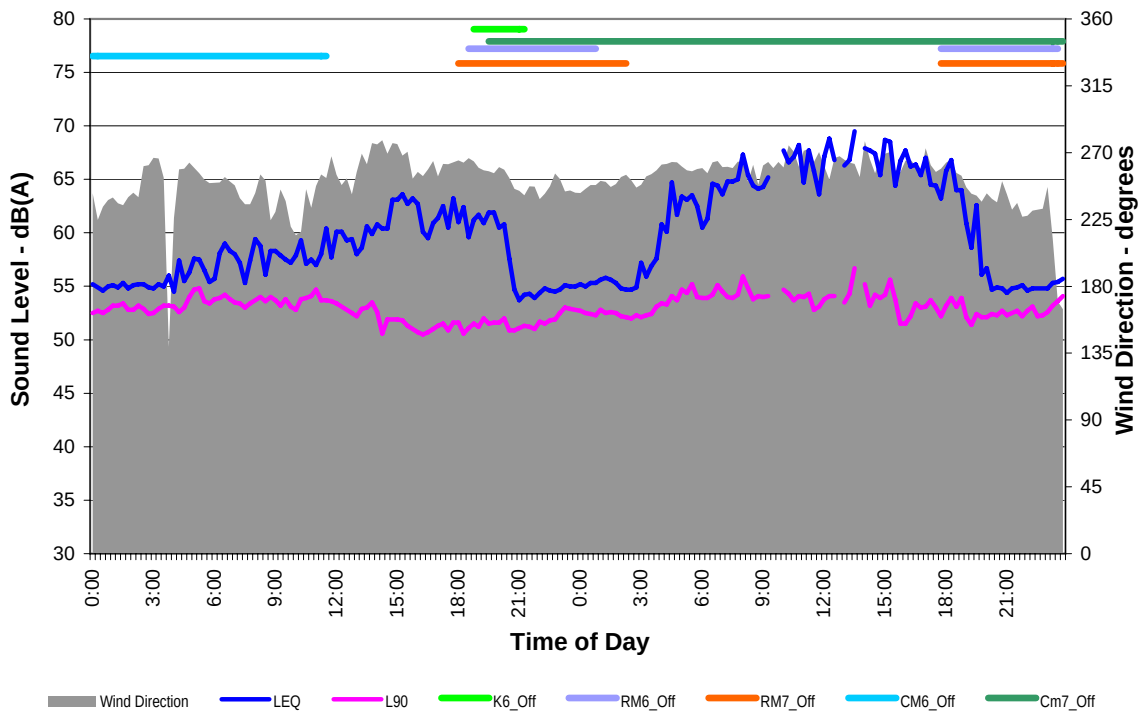
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close. New Berrima - 14 to 15 November 2019



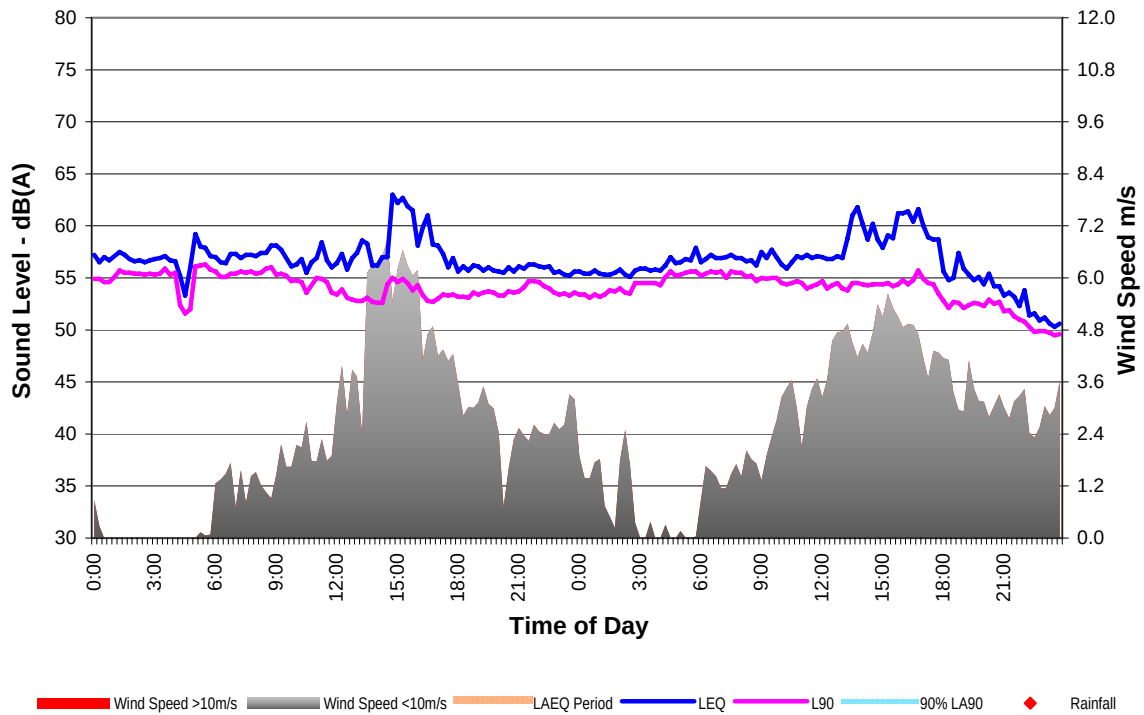
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close. New Berrima - 14 to 15 November 2019



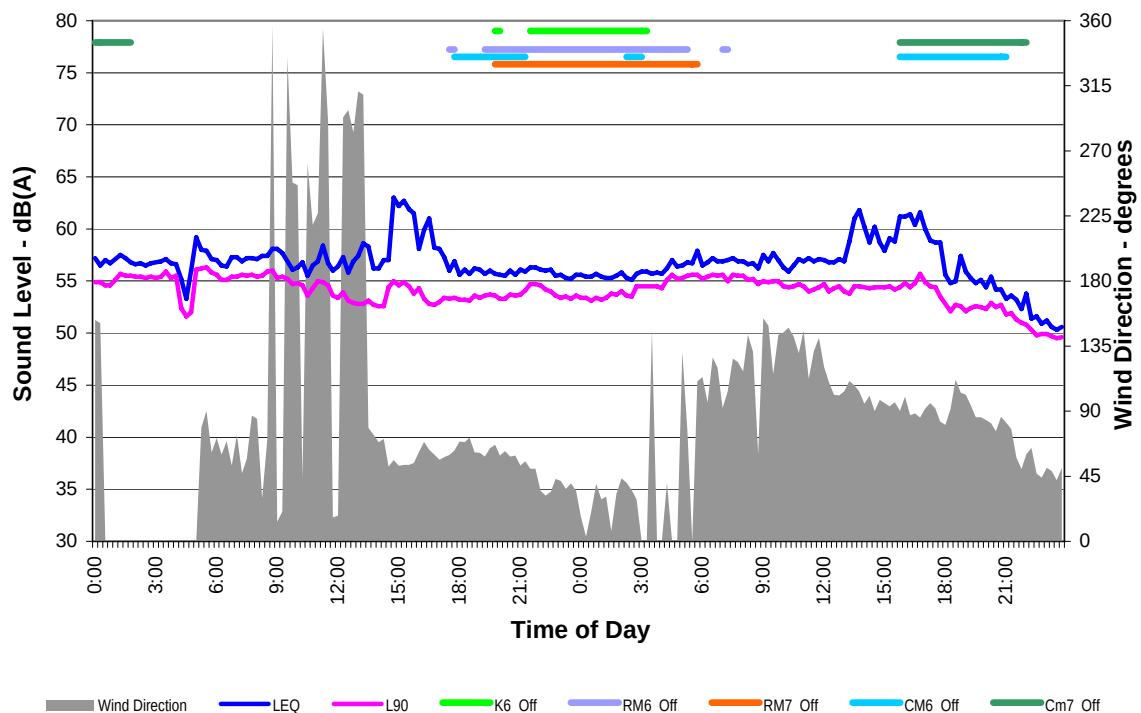
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close. New Berrima - 16 to 17 November 2019



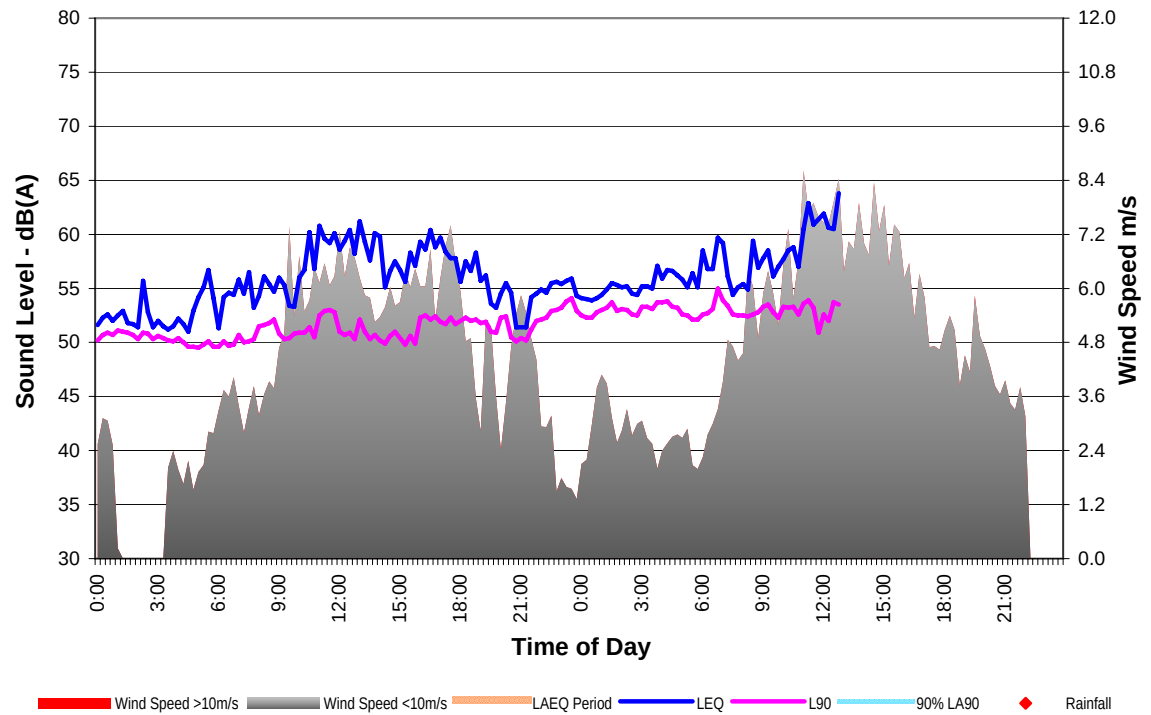
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close. New Berrima - 16 to 17 November 2019



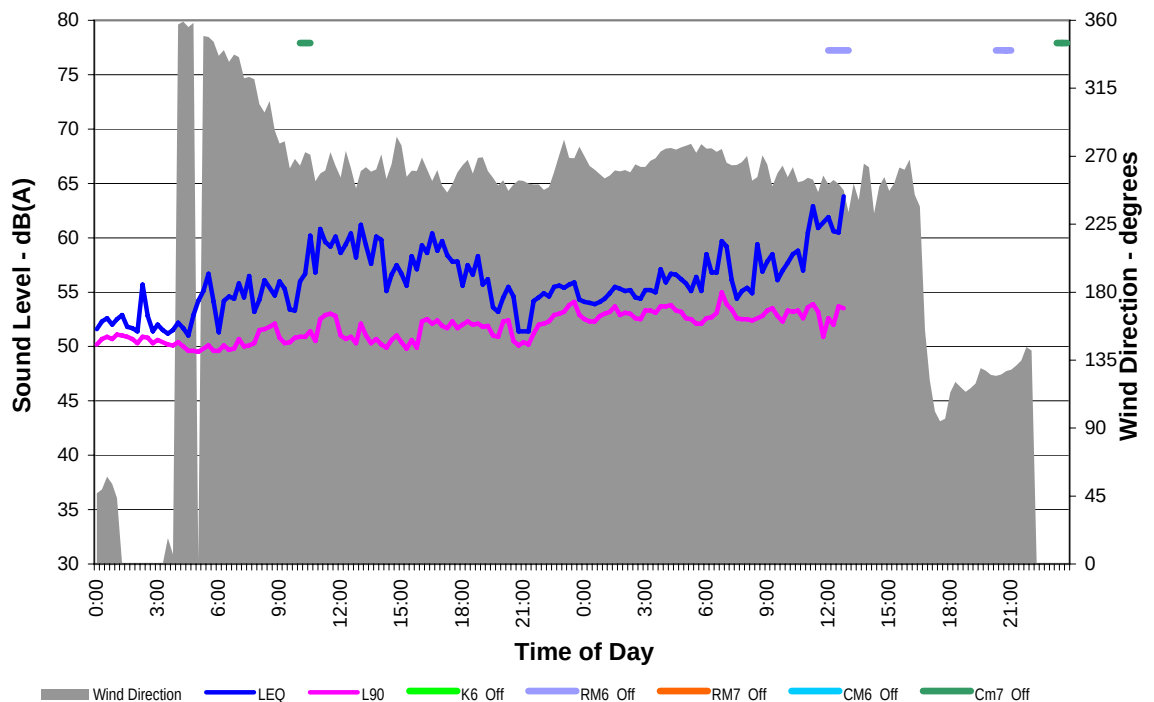
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close, New Berrima - 18 to 19 November 2019



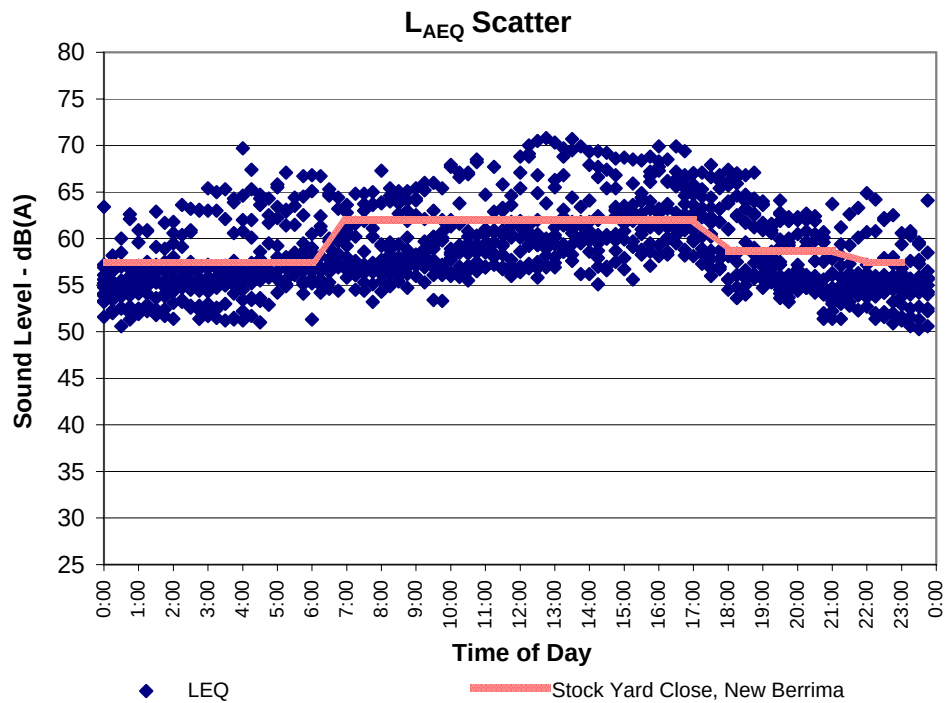
Berrima Cement Works - Ambient - Background Noise Survey

Stock Yard Close, New Berrima - 18 to 19 November 2019



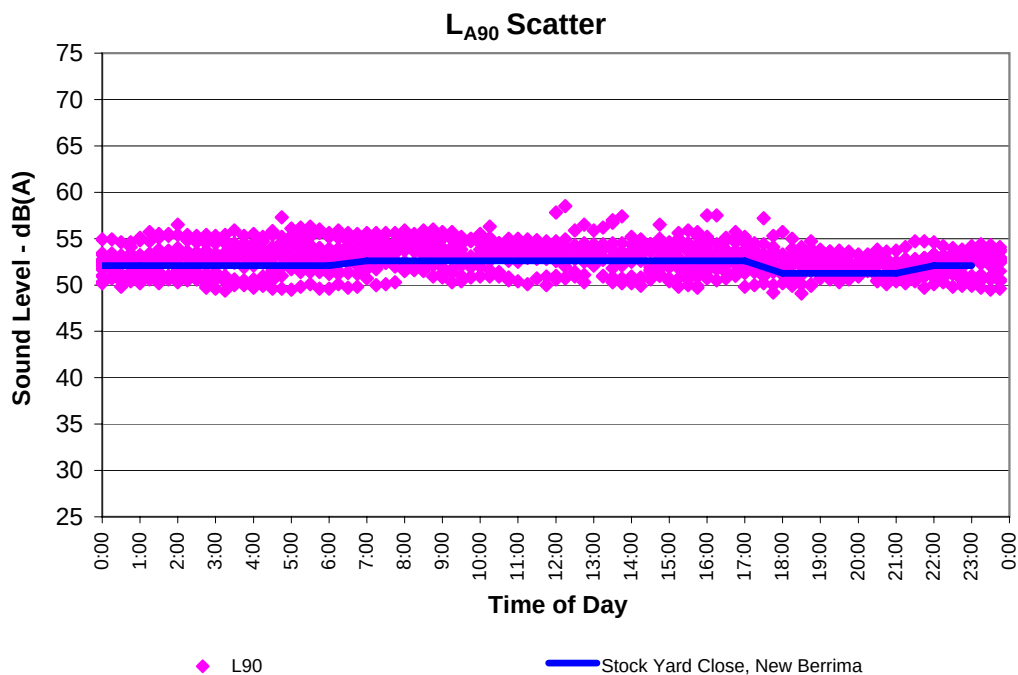
Berrima Cement Works - Ambient - Background Noise

Stock Yard Close, New Berrima - 6 to 19 November 2019



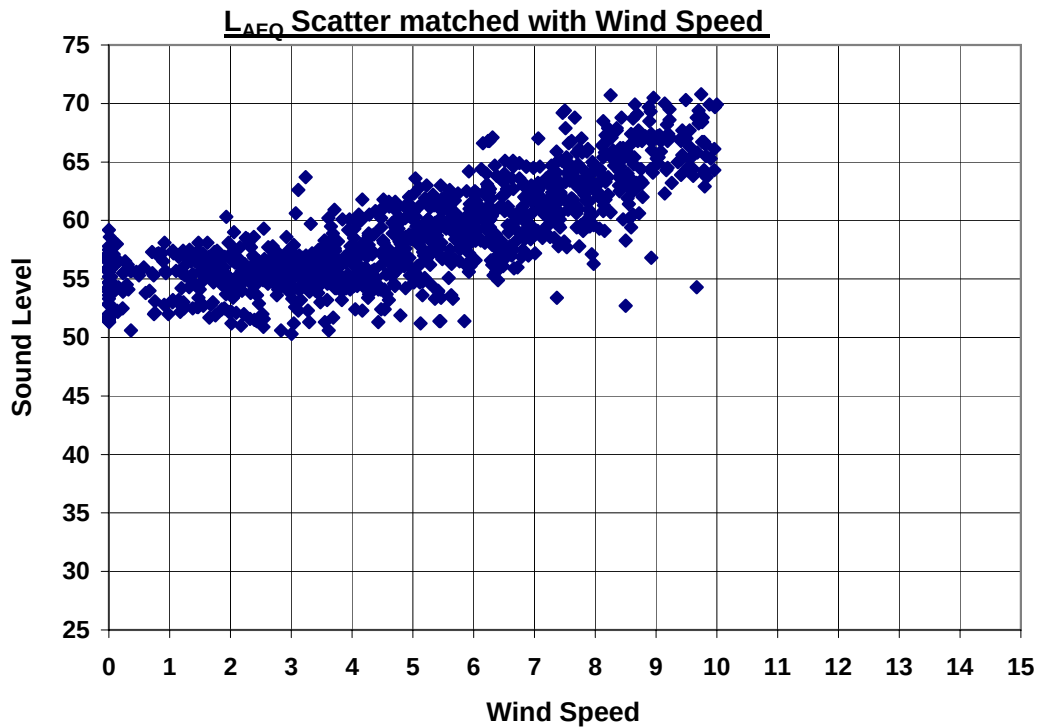
Berrima Cement Works - Ambient - Background Noise

Stock Yard Close, New Berrima - 6 to 19 November 2019



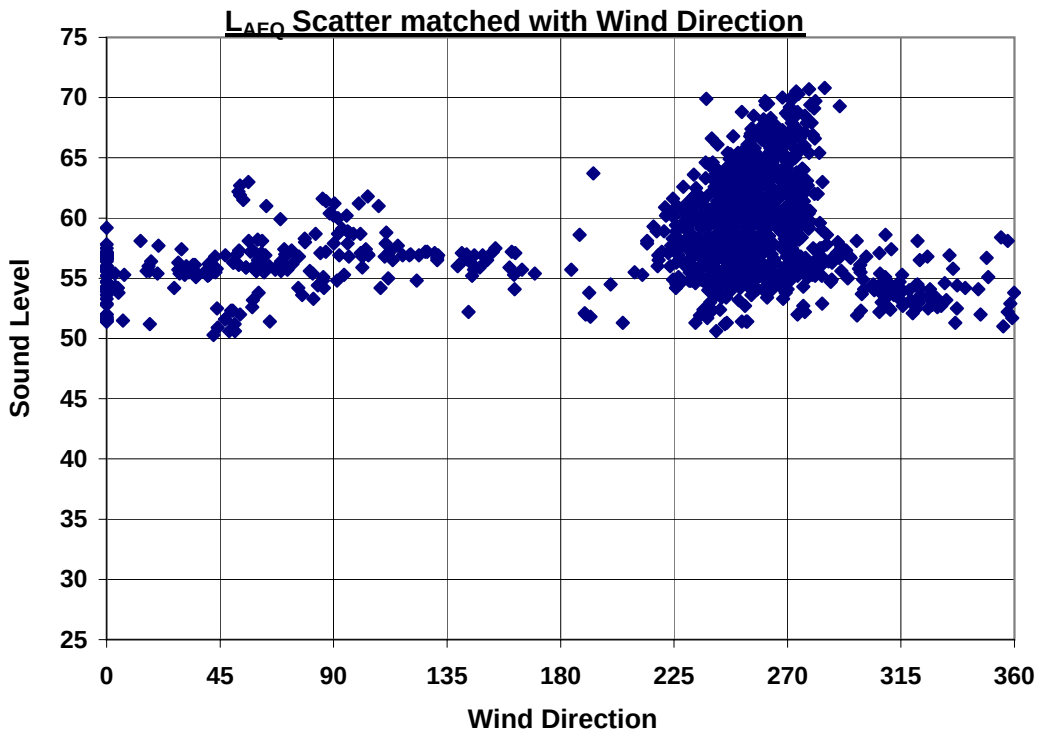
Berrima Cement Works - Ambient - Background Noise

Stock Yard Close, New Berrima - 6 to 19 November 2019



Berrima Cement Works - Ambient - Background Noise

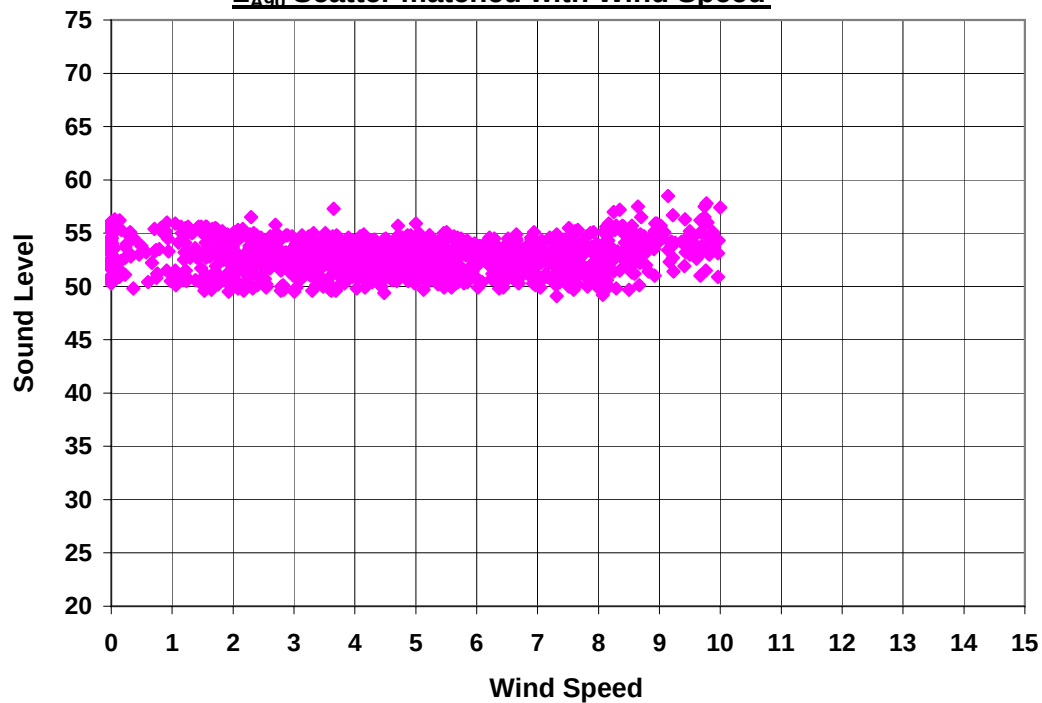
Stock Yard Close, New Berrima - 6 to 19 November 2019



Berrima Cement Works - Ambient - Background Noise

Stock Yard Close, New Berrima - 6 to 19 November 2019

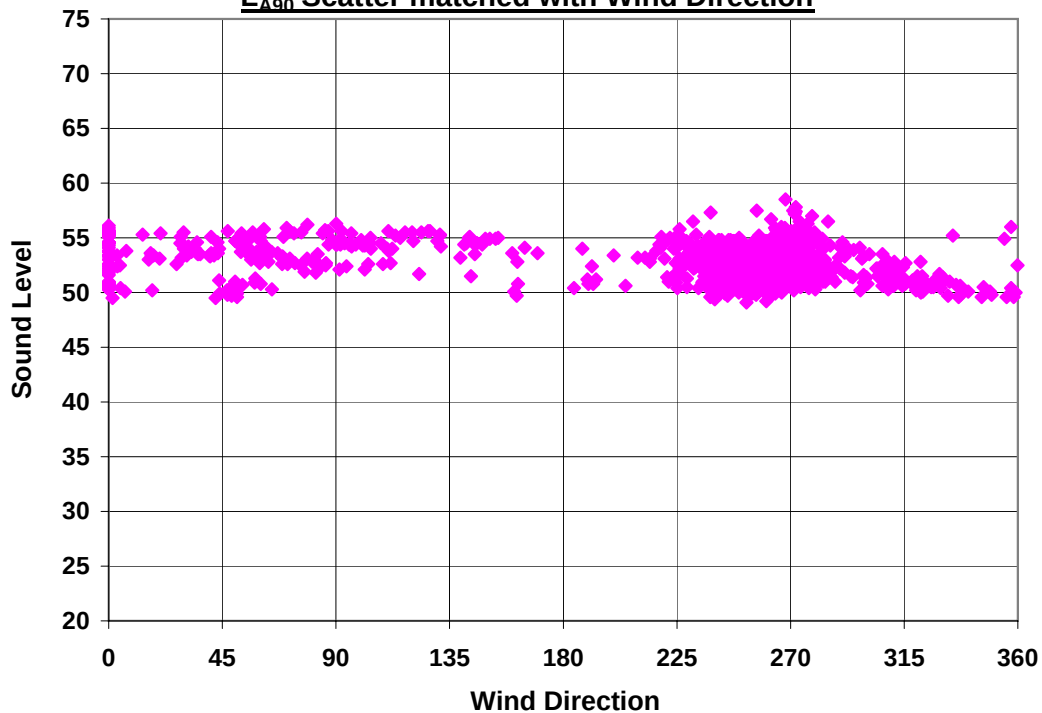
L_{A90} Scatter matched with Wind Speed



Berrima Cement Works - Ambient - Background Noise

Stock Yard Close, New Berrima - 6 to 19 November 2019

L_{A90} Scatter matched with Wind Direction



Appendix H: Narrow-band spectra from attended measurement recordings

Narrow Band Analysis

Berrima Cement Annual Compliance Noise Study June 2019

Figure H1:

Day time Spectrum for 4 Melbourne St

measured at 12:17 PM 10/09/19

2m1sec

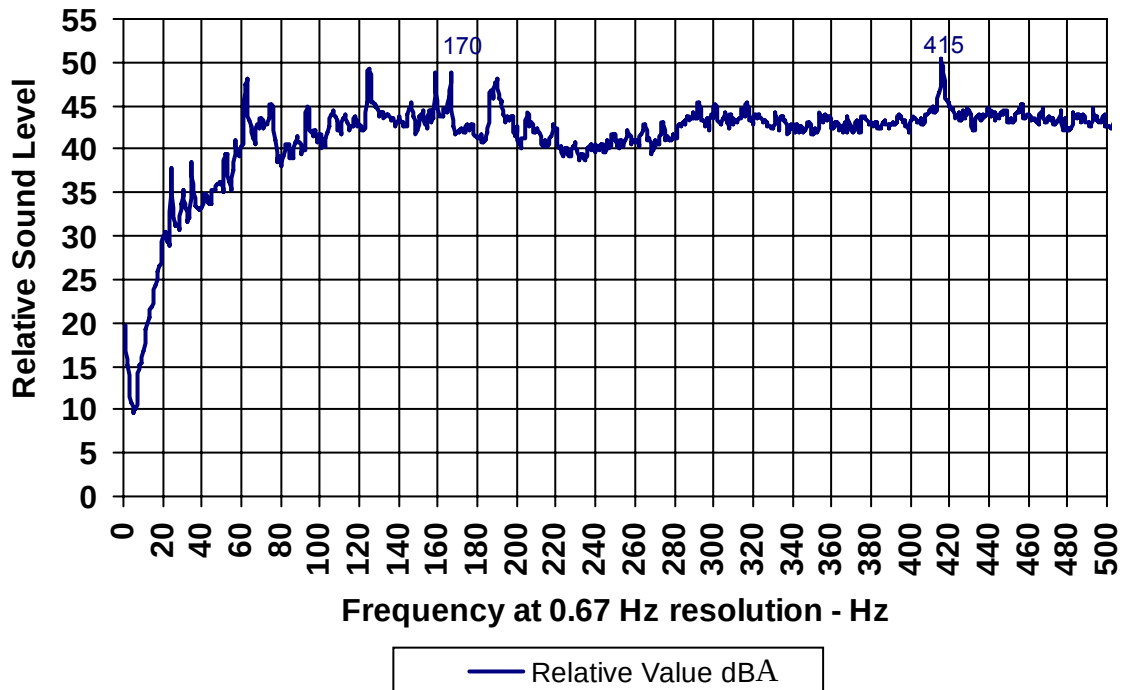
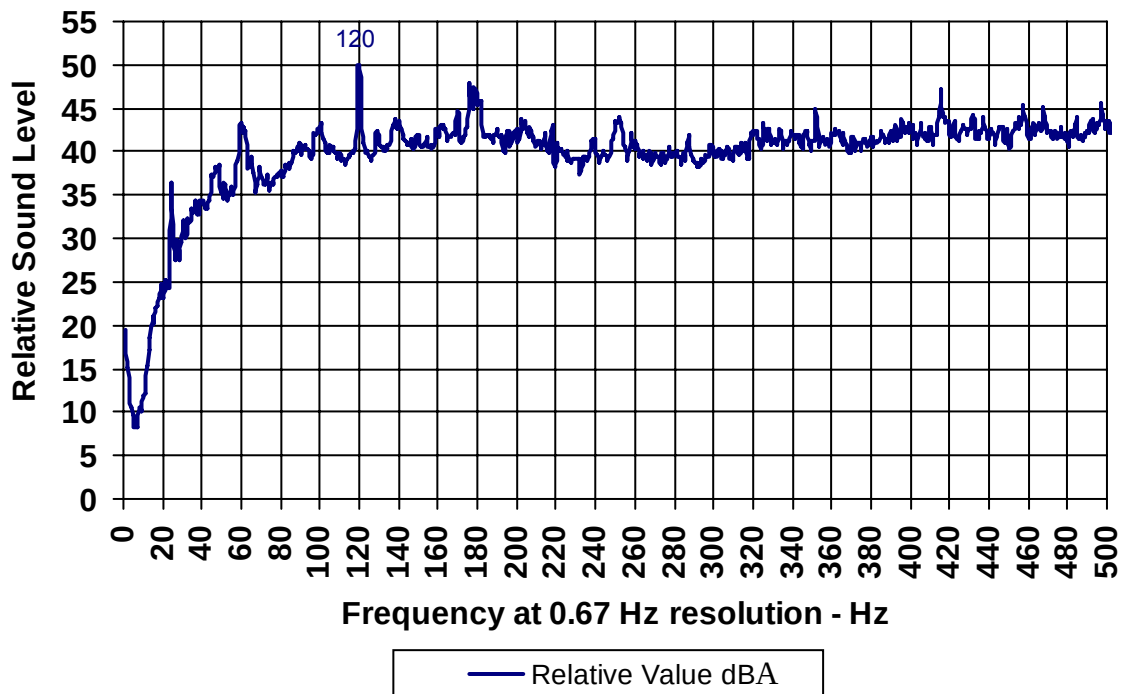


Figure H2:

Day time Spectrum for 4 Melbourne St

measured at 4:50 PM 02/10/19

2m1sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H3:

Day time Spectrum for 72 Taylor Ave

measured at 5:28 PM 02/10/19

3m13sec

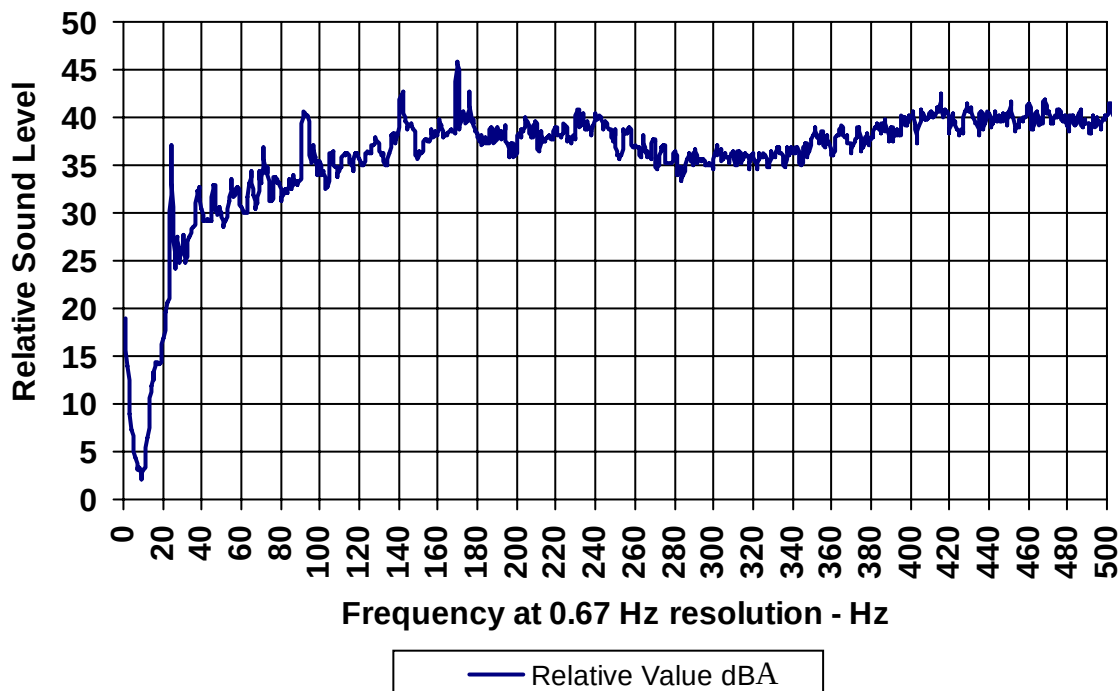
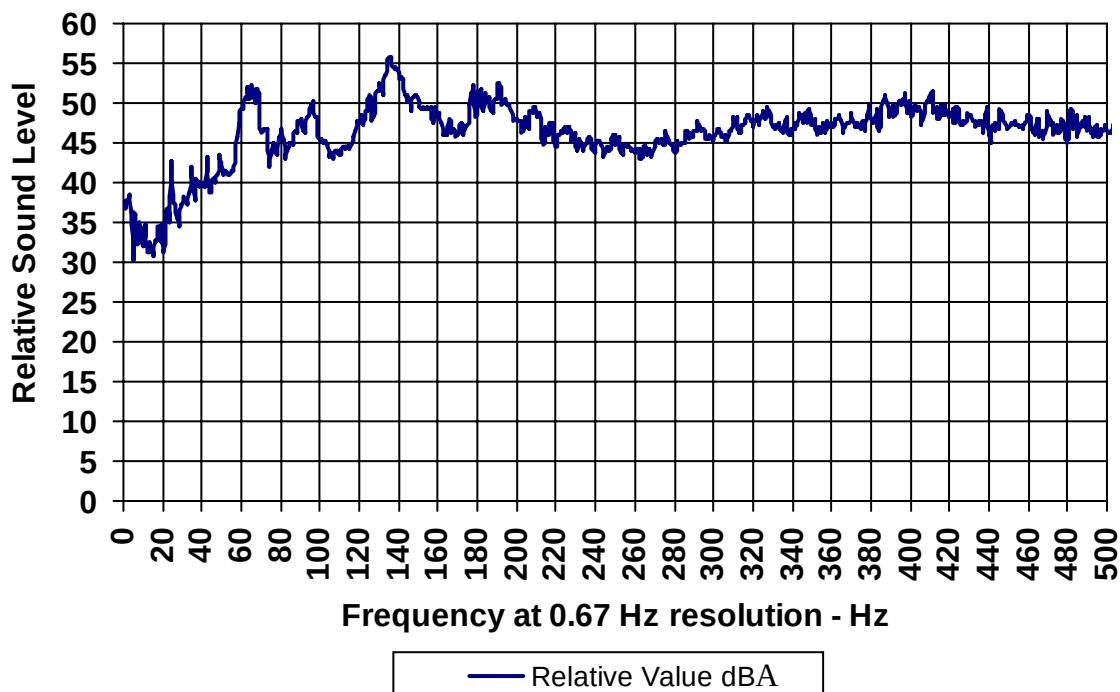


Figure H4:

Day time Spectrum for 72 Taylor Ave

measured at 12:55 PM 10/09/19

2m6sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H5:

Day time Spectrum for 72 Taylor Ave'
measured at 11:25 PM 02/10/19

3m12sec

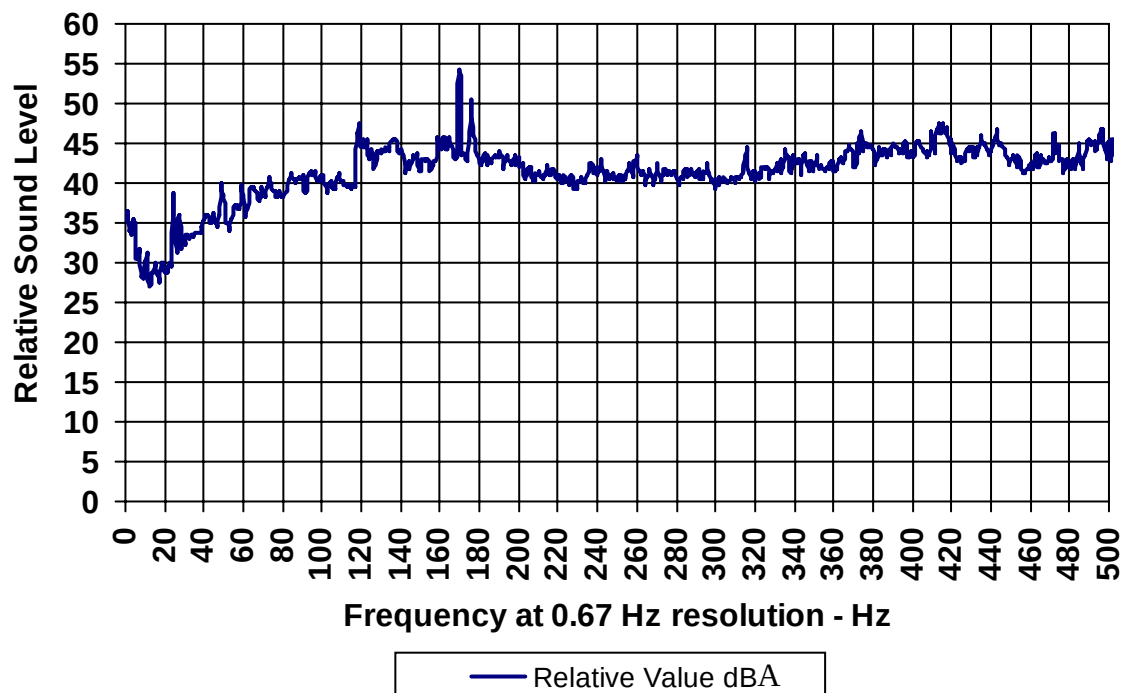
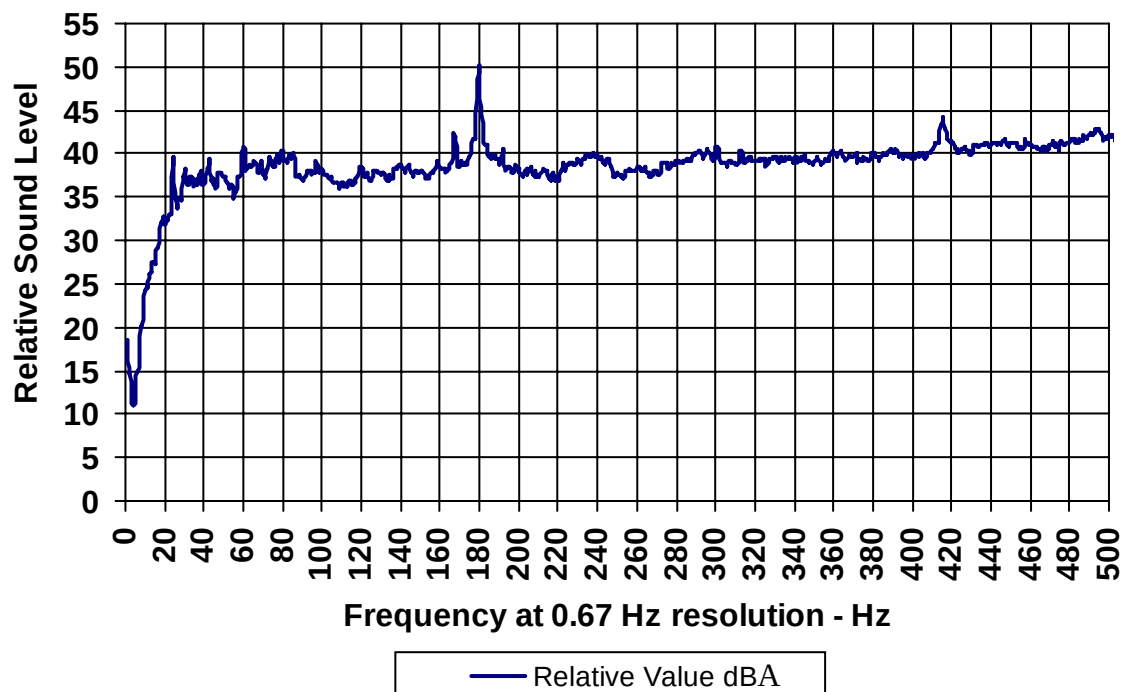


Figure H6:

Day time Spectrum for North Fence
measured at 12:31 PM 19/11/19

2m1sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H7:

Day time Spectrum for North Fence

measured at 3:11 PM 06/11/19

1m3sec

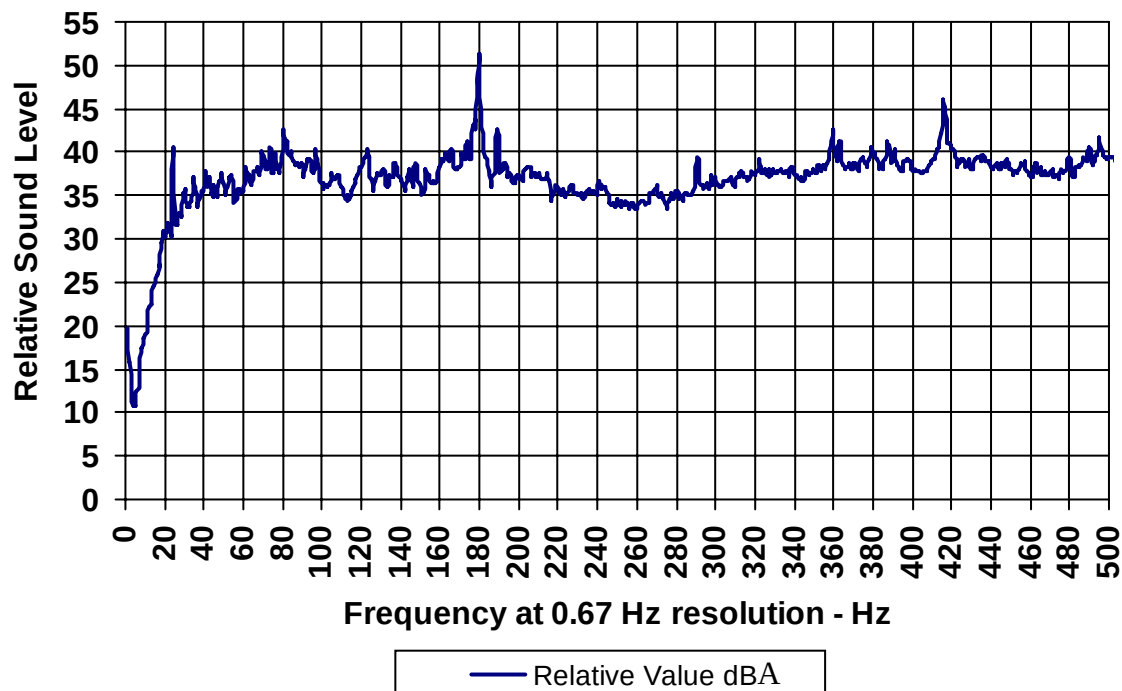
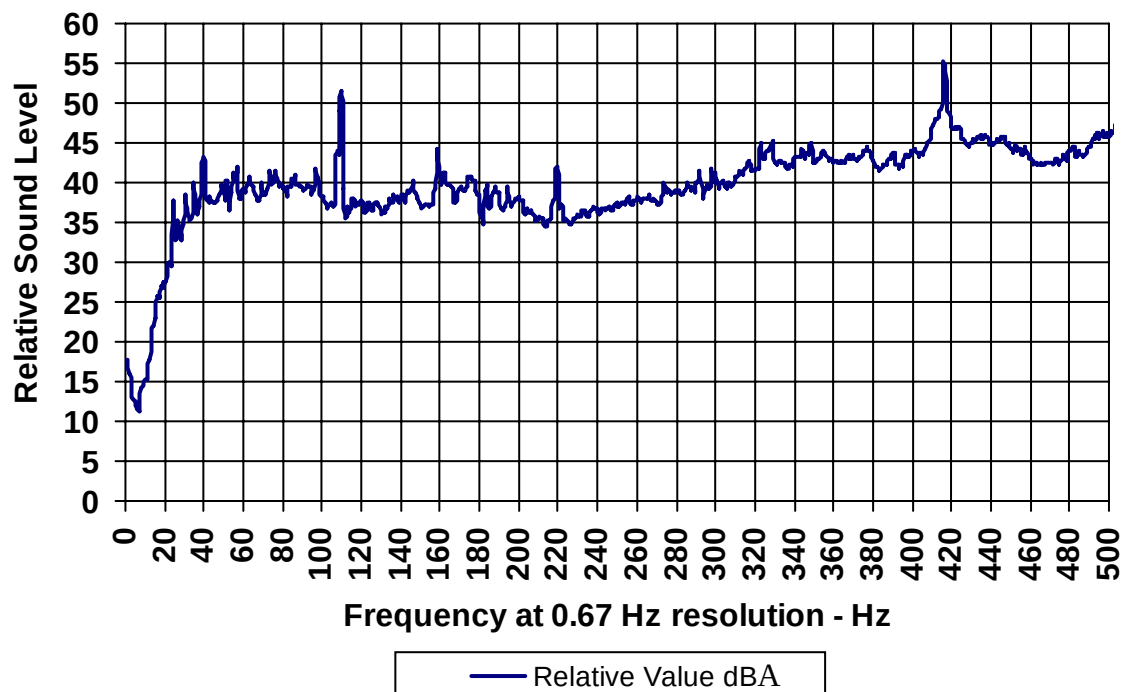


Figure H8:

Day time Spectrum for North Fence

measured at 10:34 AM 10/09/19

2m15sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H9:

Day time Spectrum for North Fence

measured at 4:03 PM 02/10/19

2m4sec

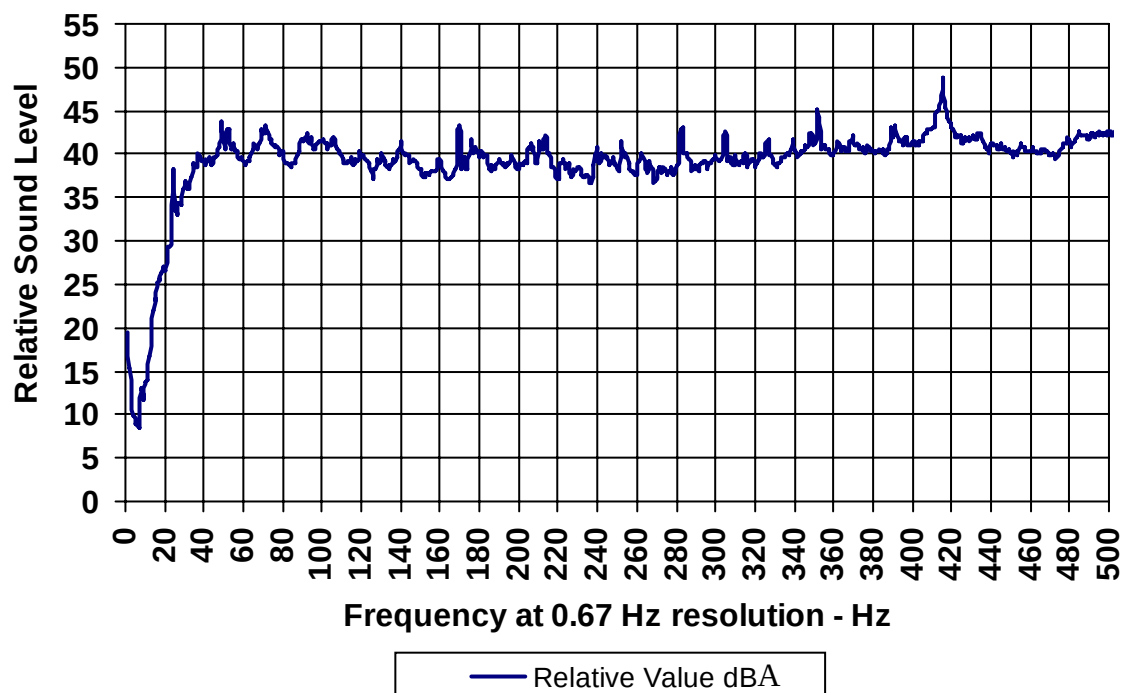
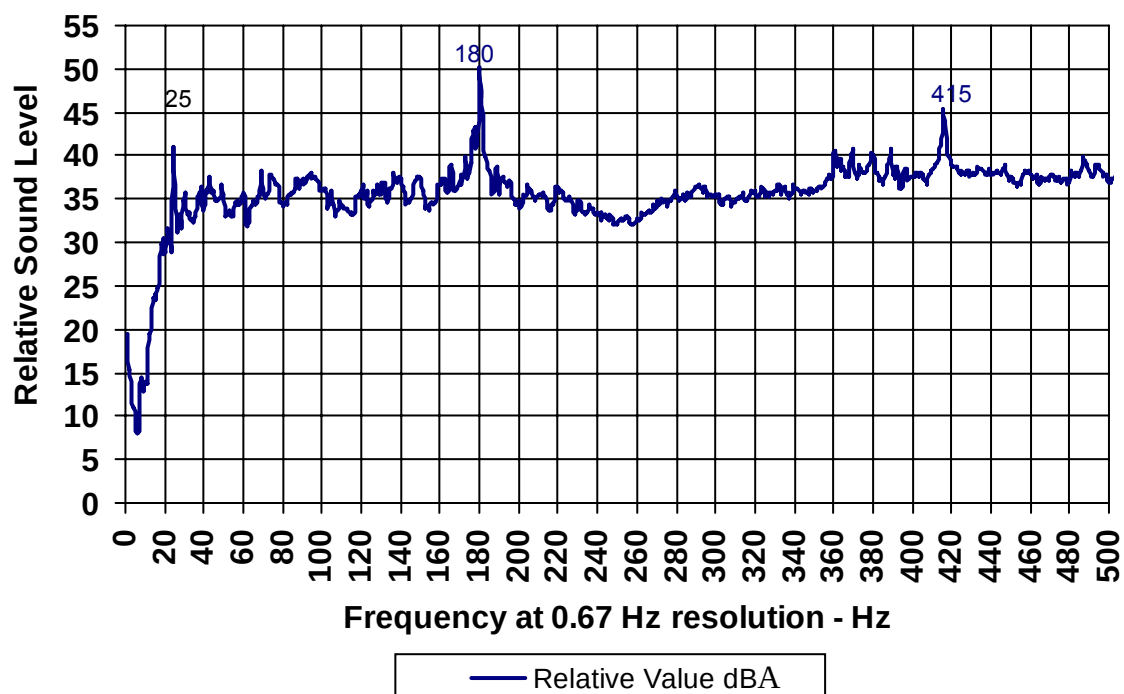


Figure H10:

Day time Spectrum for North Fence

measured at 2:22 PM 15/10/19

1m14sec



Berrima Cement Annual Compliance Noise Study June 2019

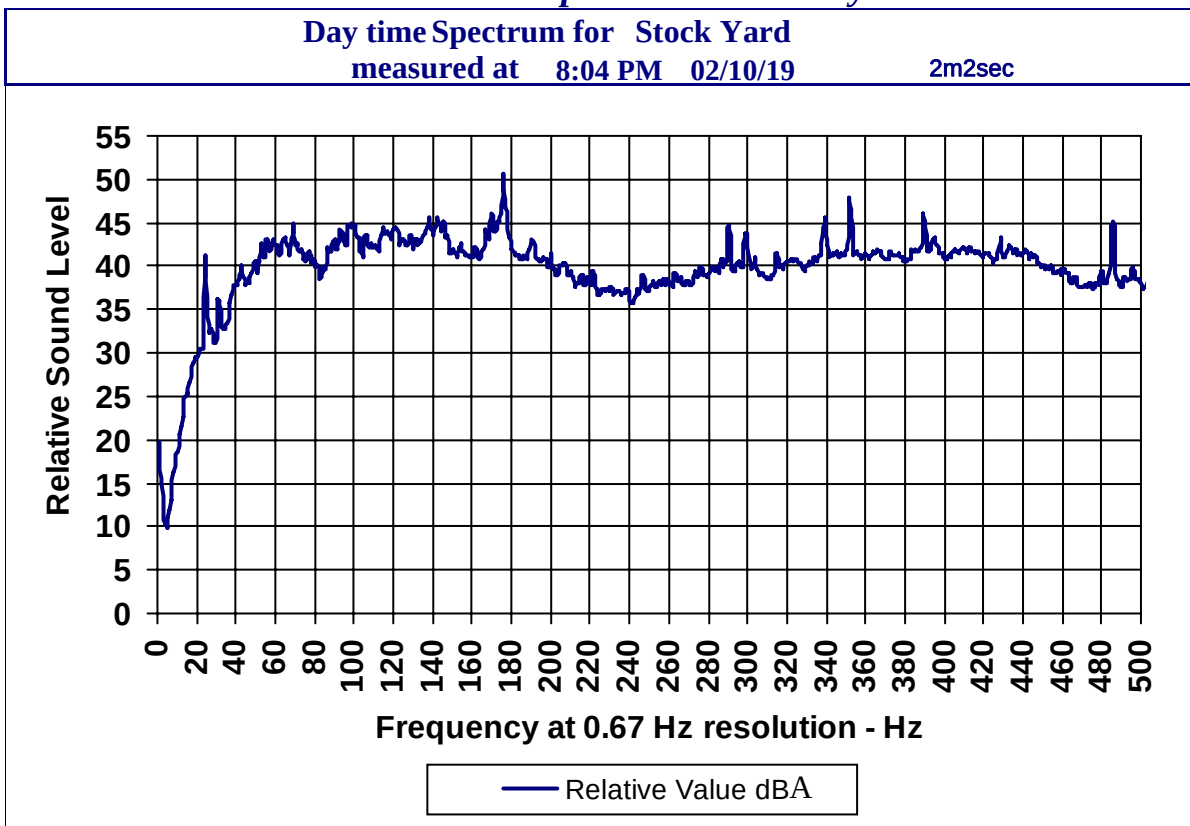
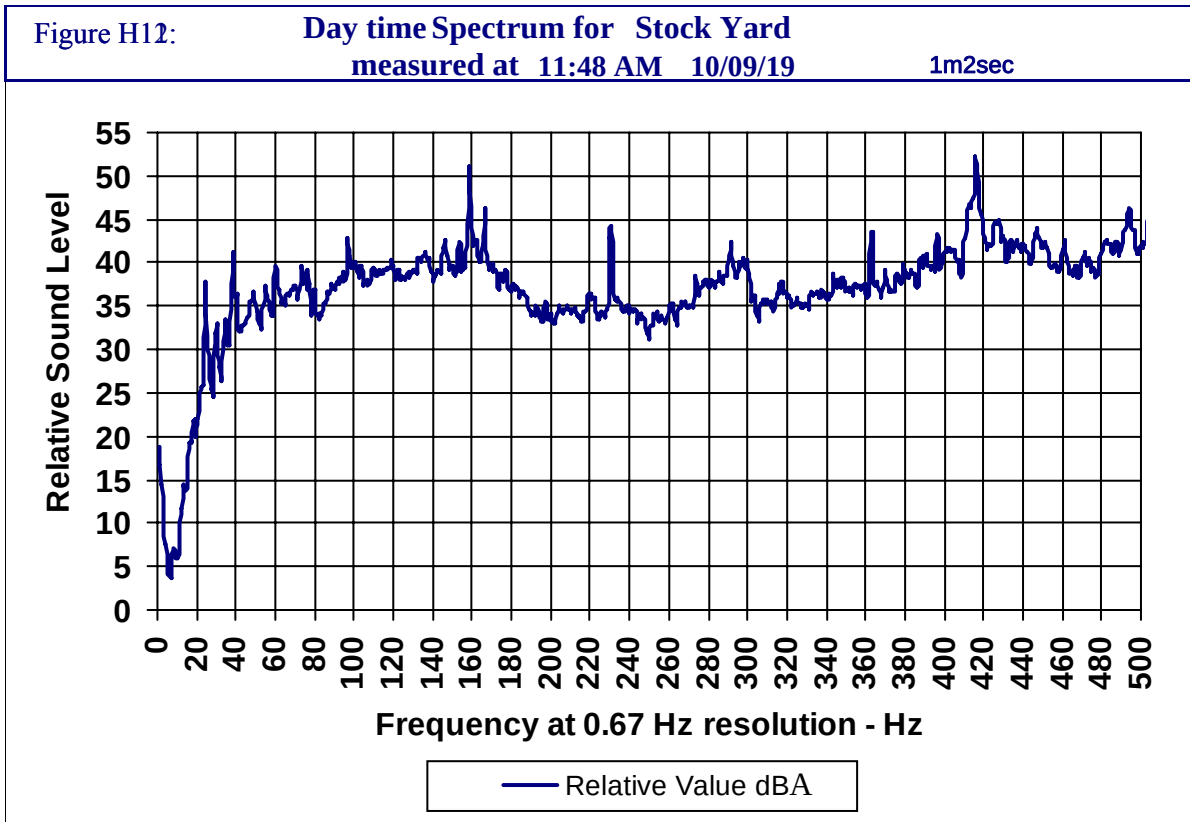


Figure H12:



Berrima Cement Annual Compliance Noise Study June 2019

Figure H13:

Day time Spectrum for Stock Yard
measured at 3:04 PM 15/10/19

2m6sec

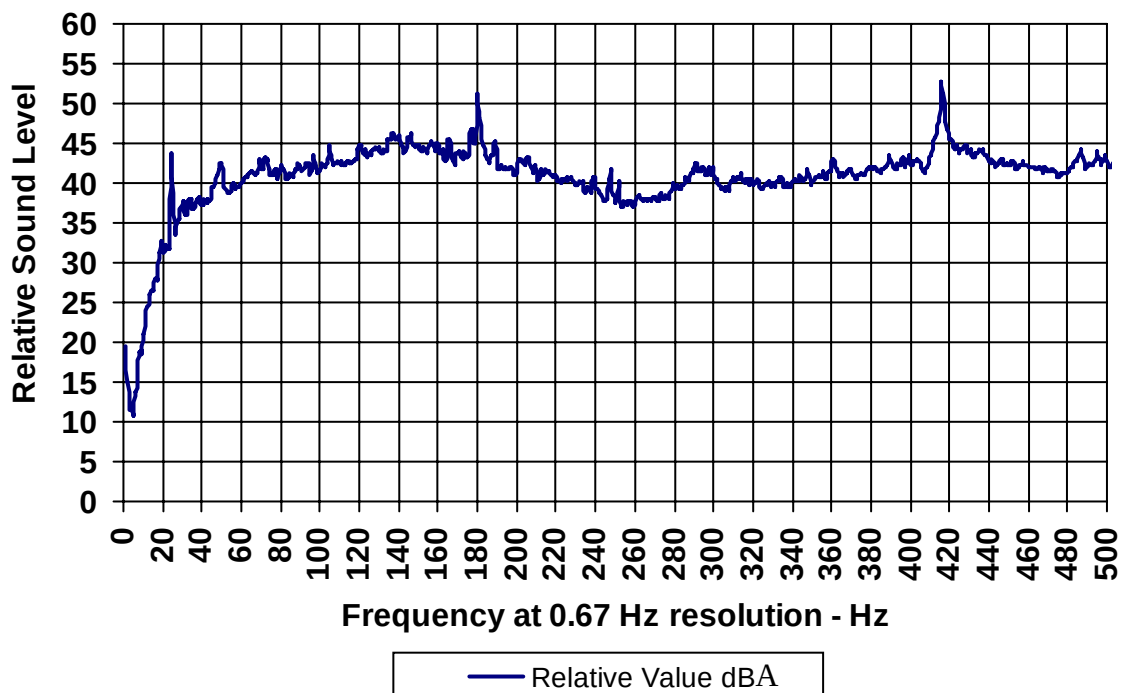
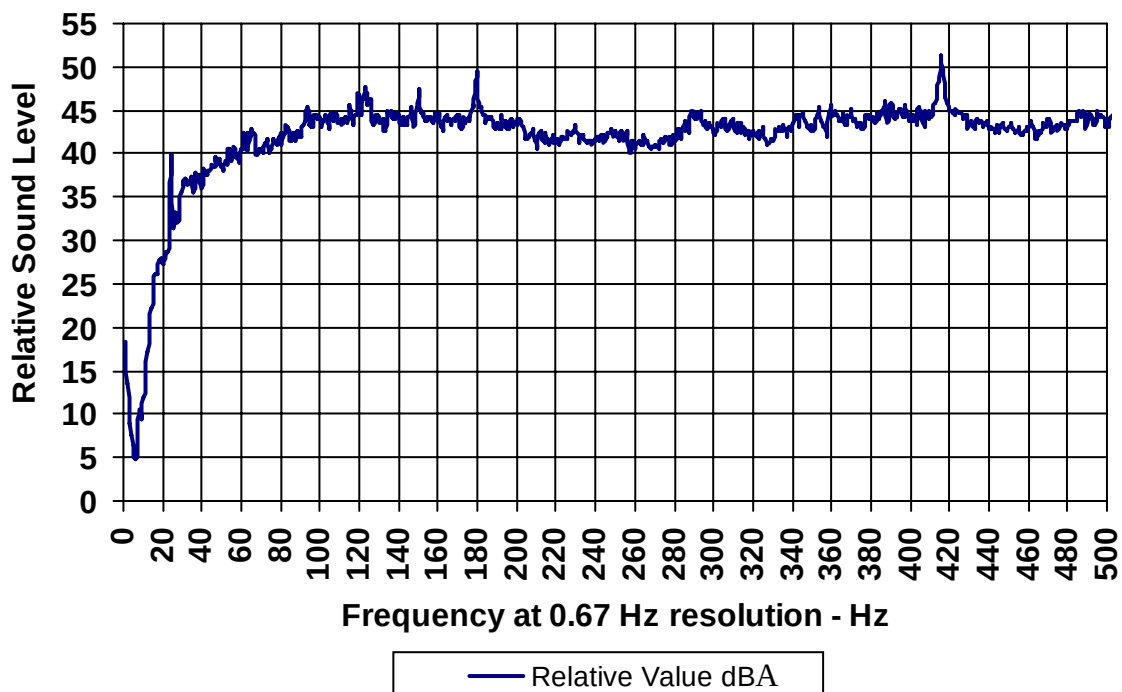


Figure H14:

Day time Spectrum for Stock Yard
measured at 1:18 PM 19/11/19

2m1sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H15:

Day time Spectrum for Stock Yard

measured at 1:30 PM 01/11/19

1m3sec

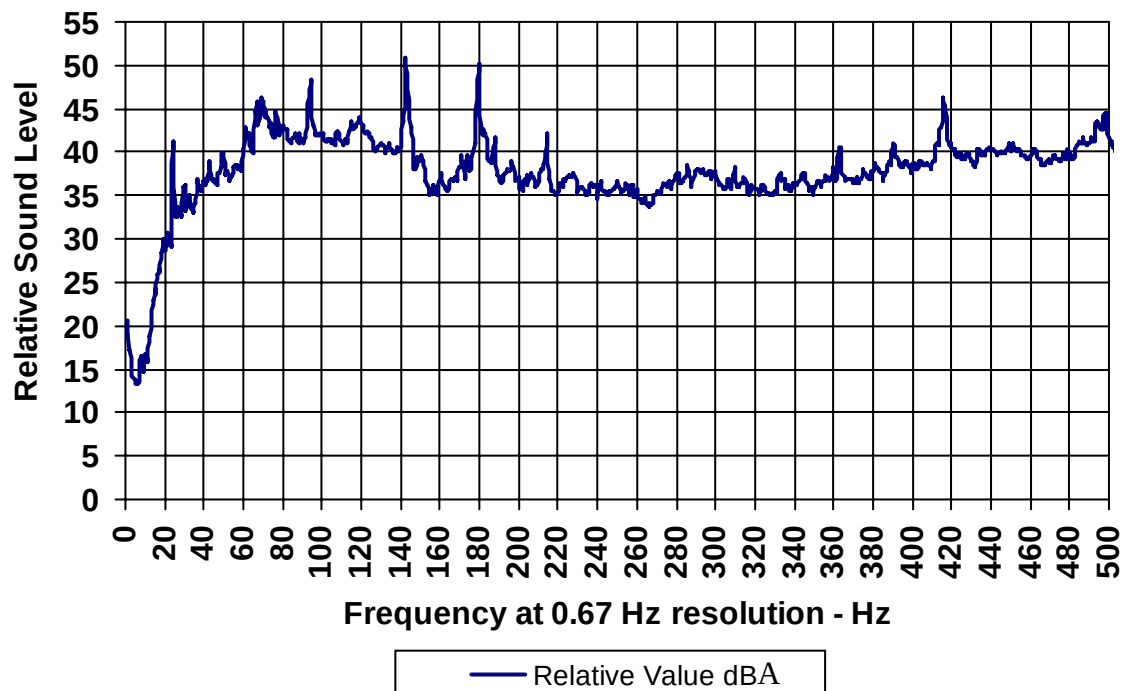
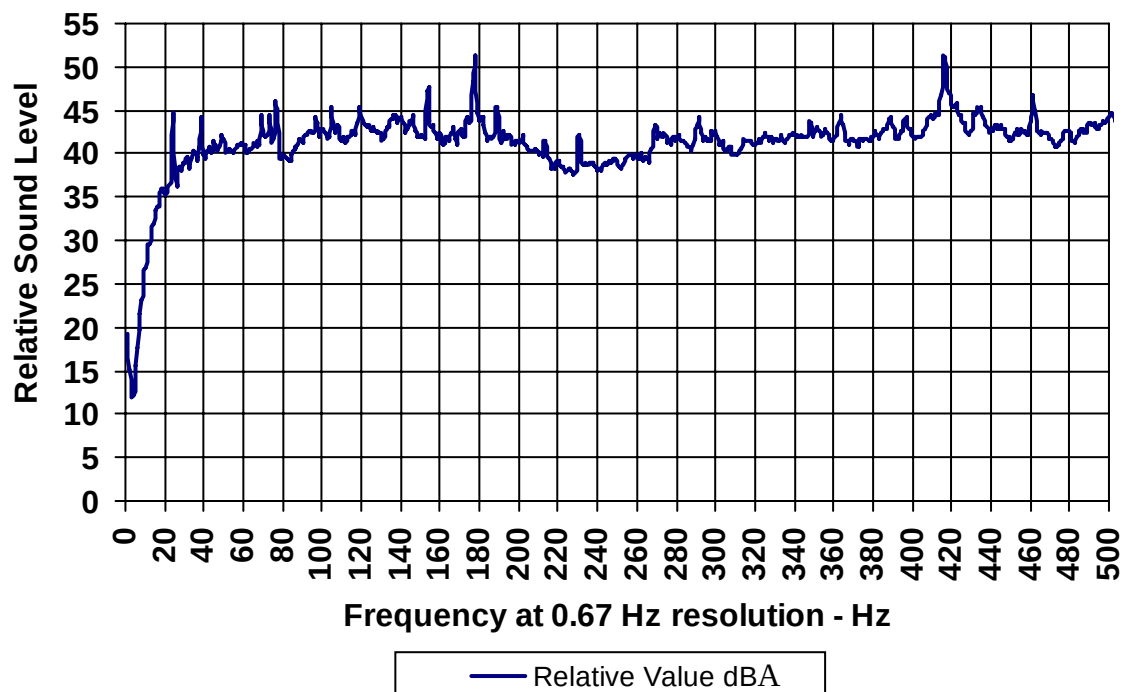


Figure H16:

Day time Spectrum for Stock Yard

measured at 4:24 PM 06/11/19

2m1sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H17:

Day time Spectrum for Stock Yard
measured at 11:30 AM 10/09/19

2m15sec

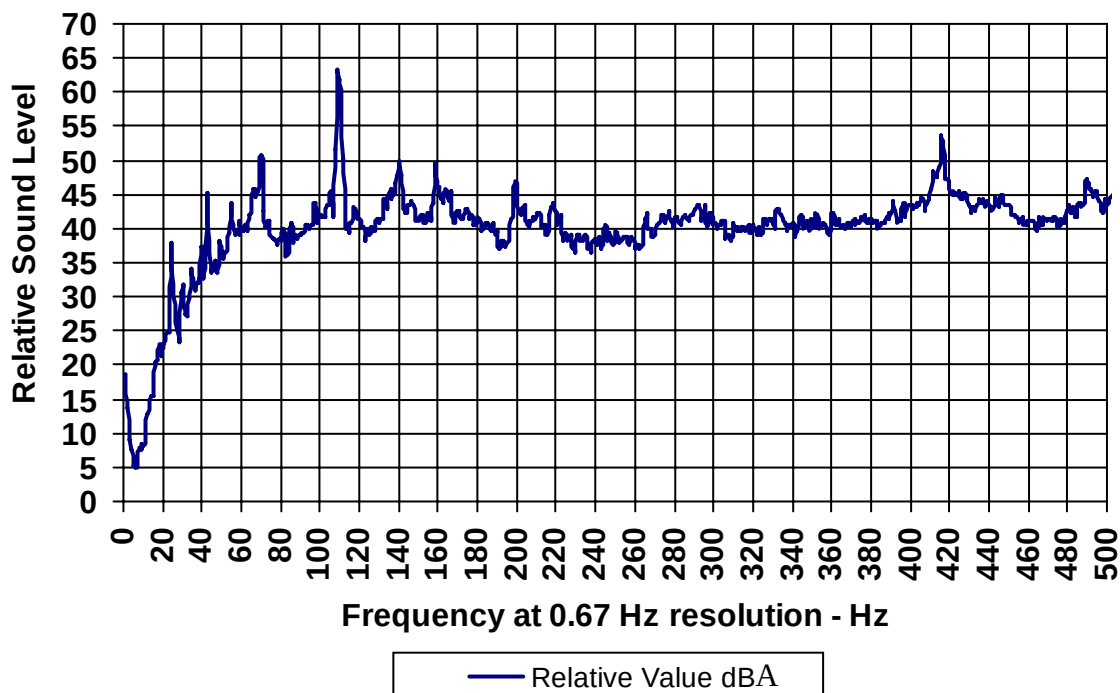
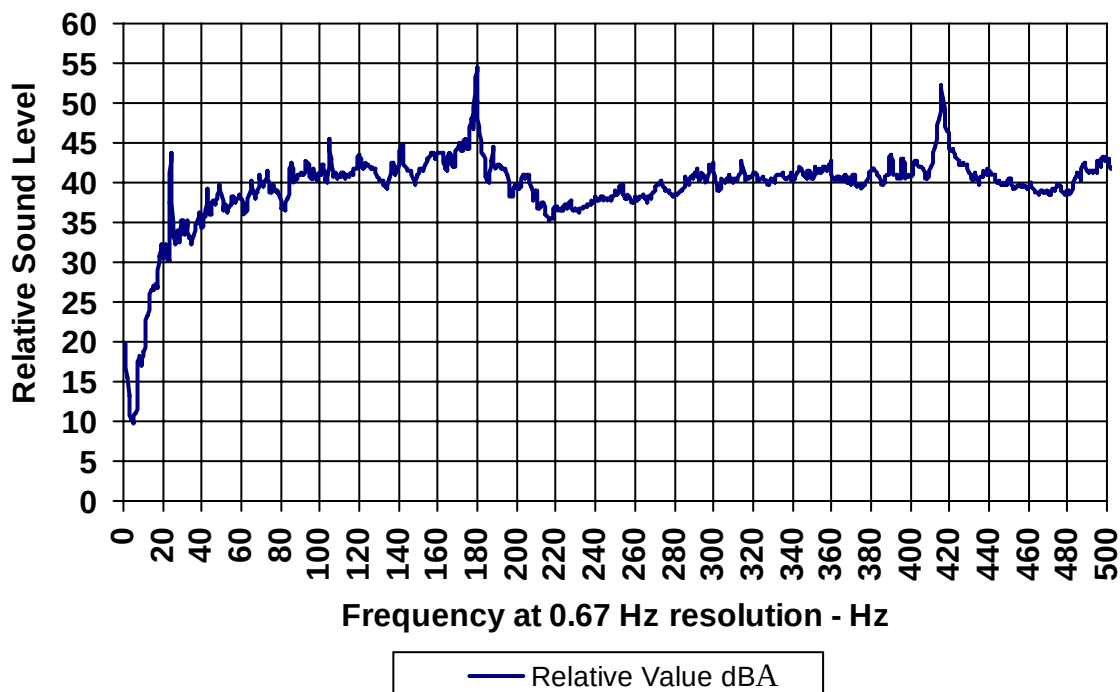


Figure H18:

Day time Spectrum for Stock Yard
measured at 3:33 PM 01/11/19

2m1sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H19:

Day time Spectrum for Stock Yard noise event

measured at 4:24 PM 06/11/19

0m32sec

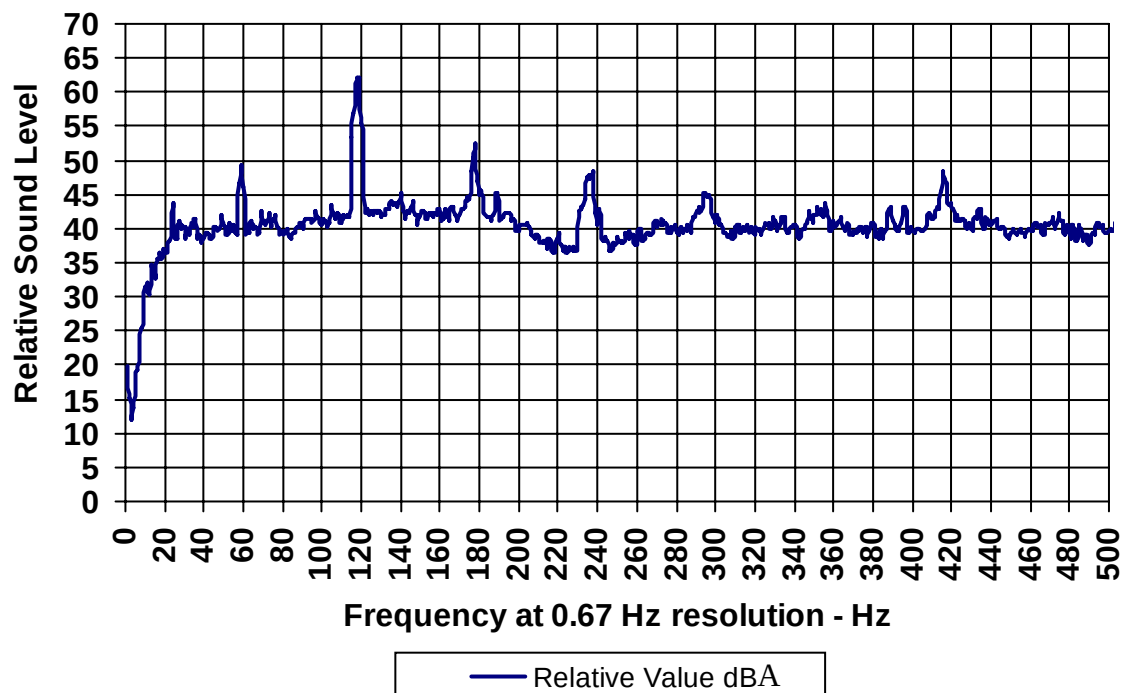
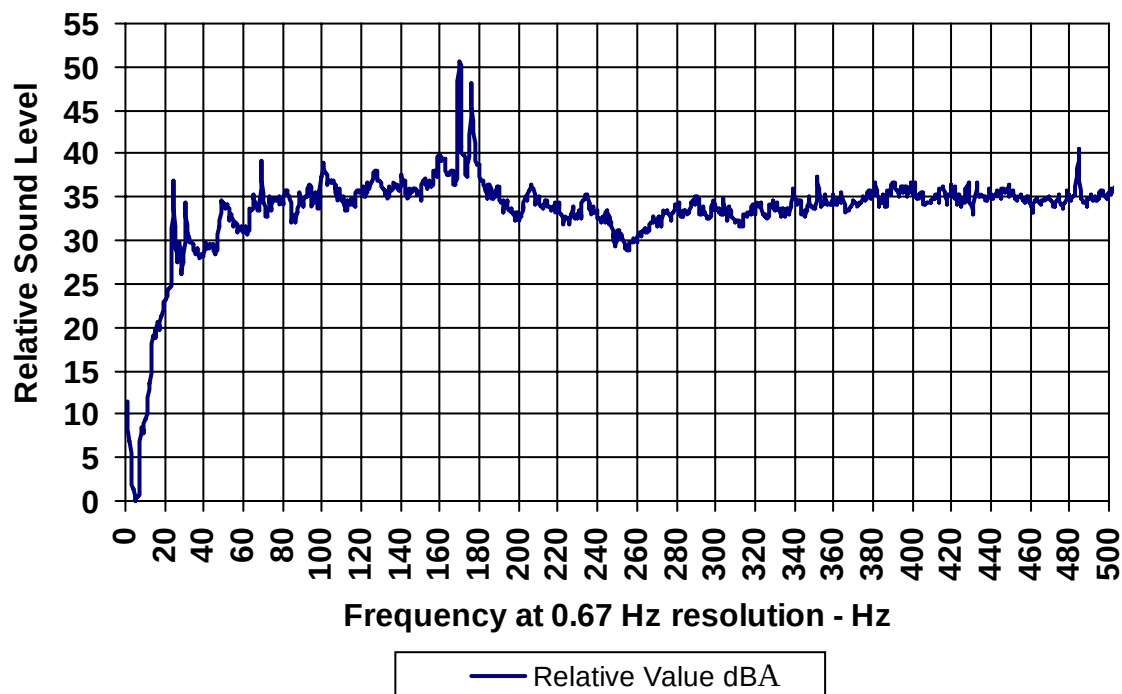


Figure H20:

Evening time Spectrum for 12 Brisbane St

measured at 9:28 PM 02/10/19

2m21sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H21: Evening time Spectrum for 30 Adelaide St
measured at 9:09 PM 02/10/19 1m31sec

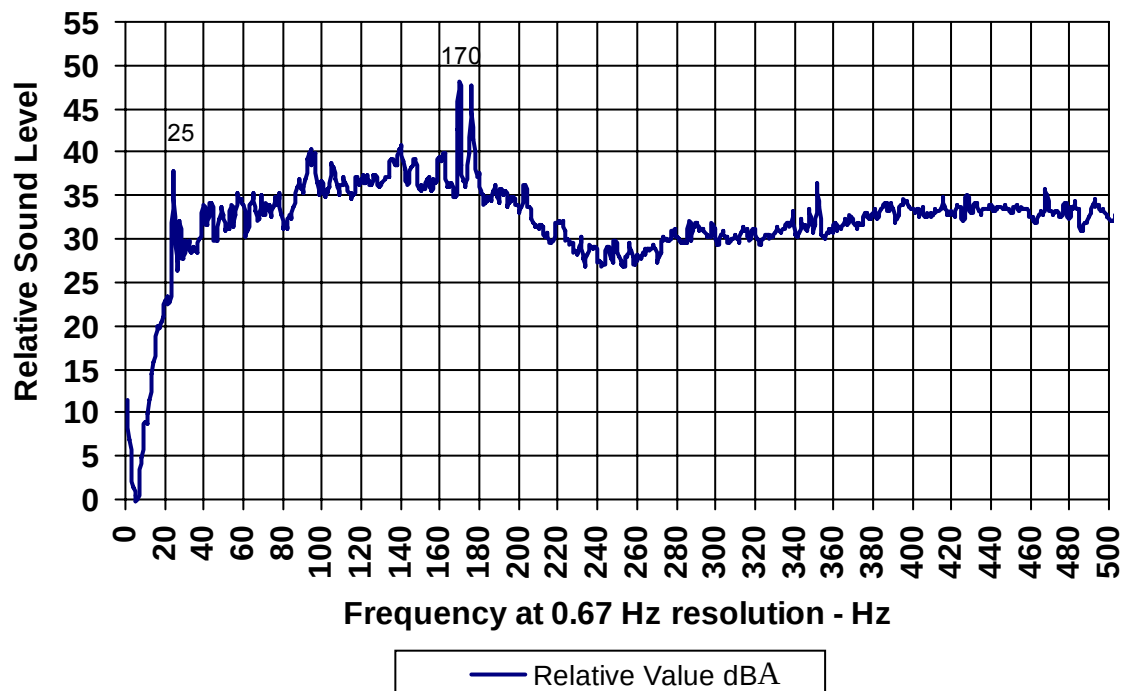
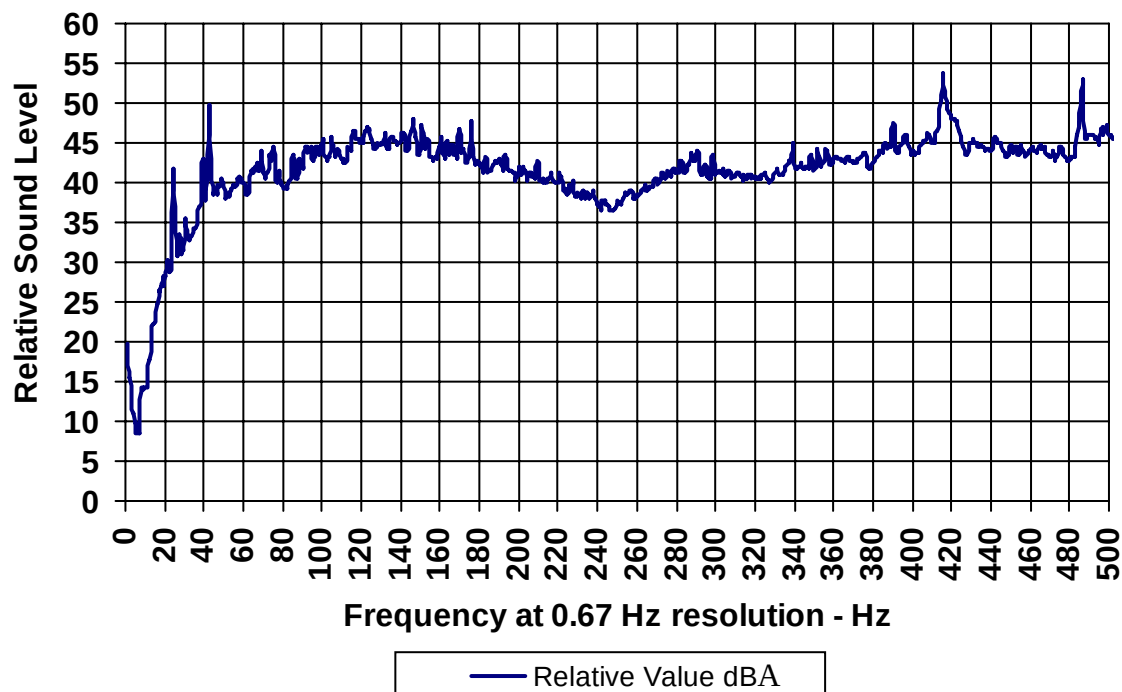


Figure H22: Evening time Spectrum for 4 Melbourne St
measured at 8:28 PM 02/10/19 2m4sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H23: Evening time Spectrum for 72 Taylor Ave
measured at 8:47 PM 02/10/19

1m35sec

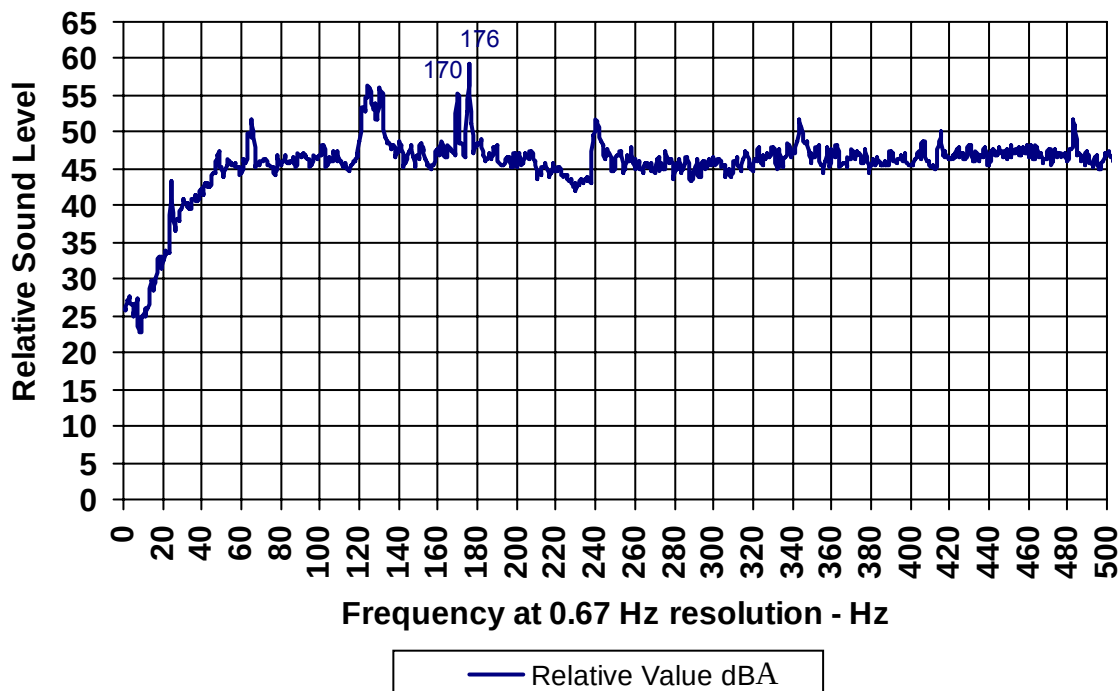
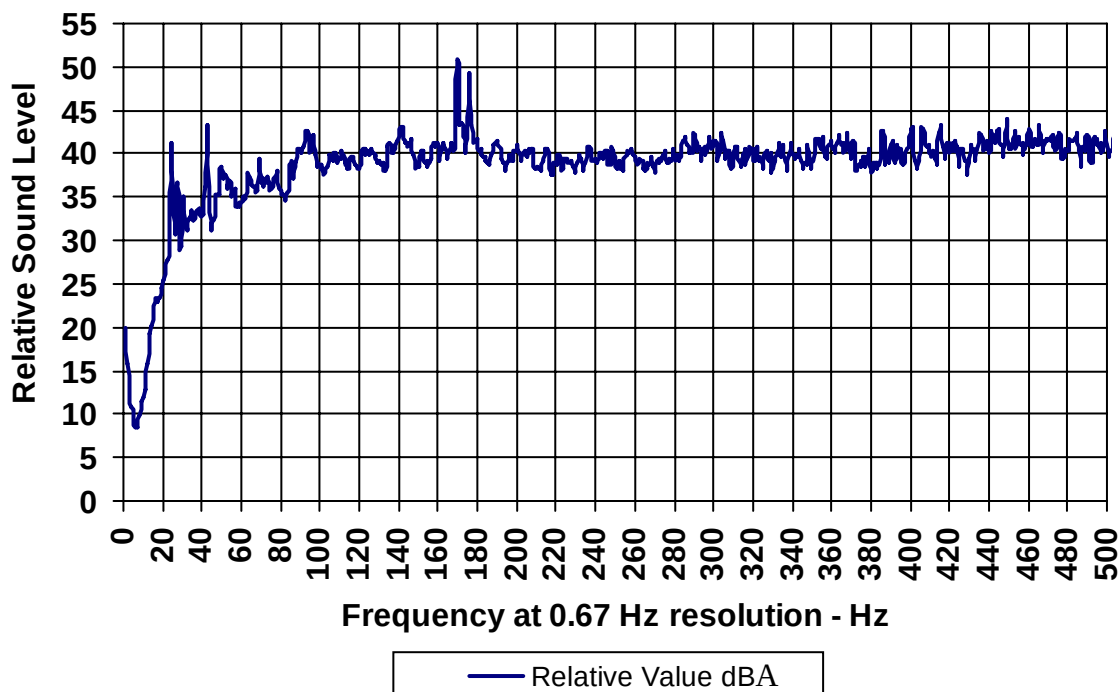


Figure H24: Evening time Spectrum for 72 Taylor Ave
measured at 8:48 PM 02/10/19

1m41sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H25: Evening time Spectrum for Argyle St
measured at 9:47 PM 02/10/19 2m15sec

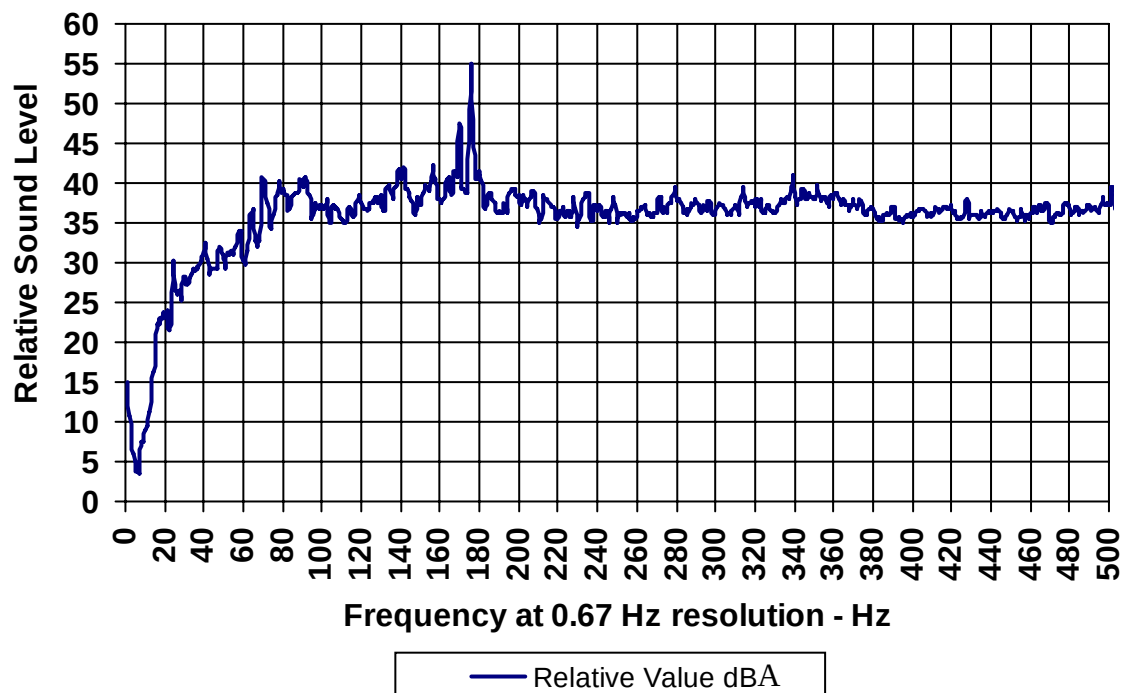
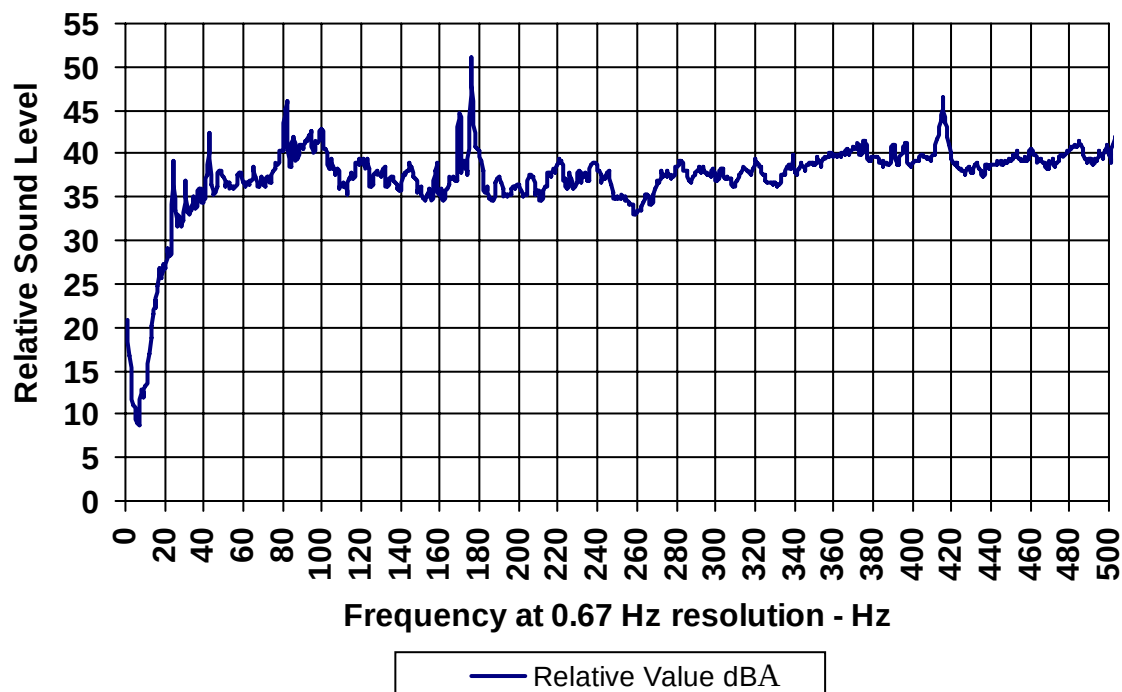


Figure H26: Evening time Spectrum for North Fence
measured at 7:37 PM 02/10/19 2m4sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H27: Evening time Spectrum for North Fence
measured at 7:37 PM 02/10/19

1m5sec

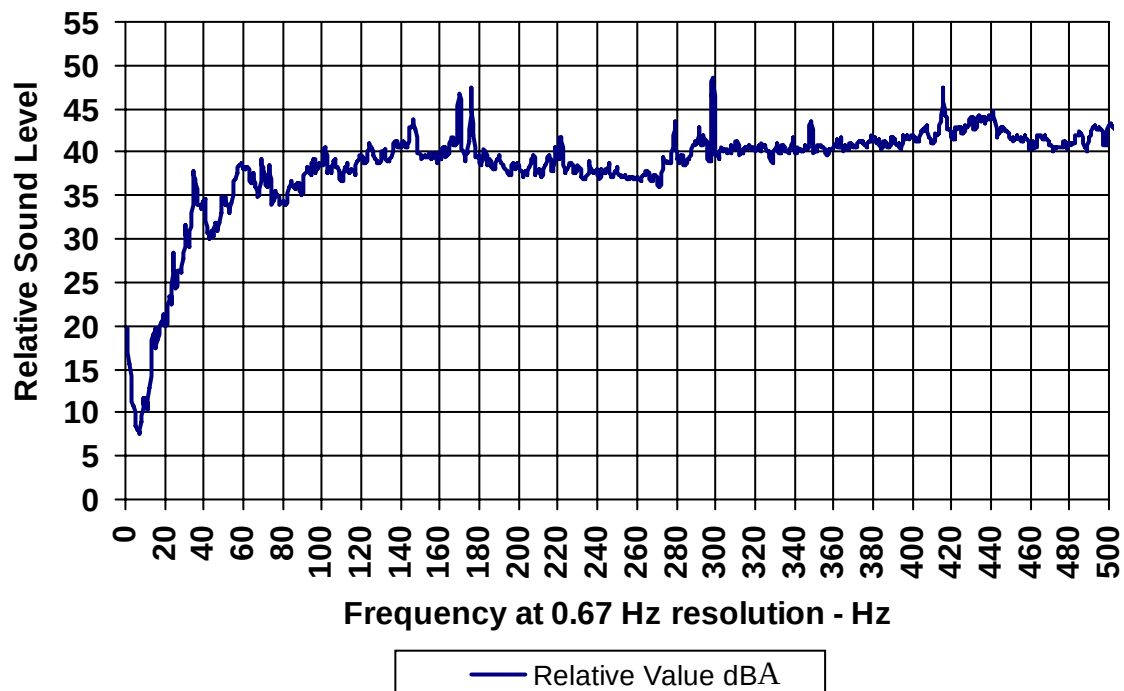
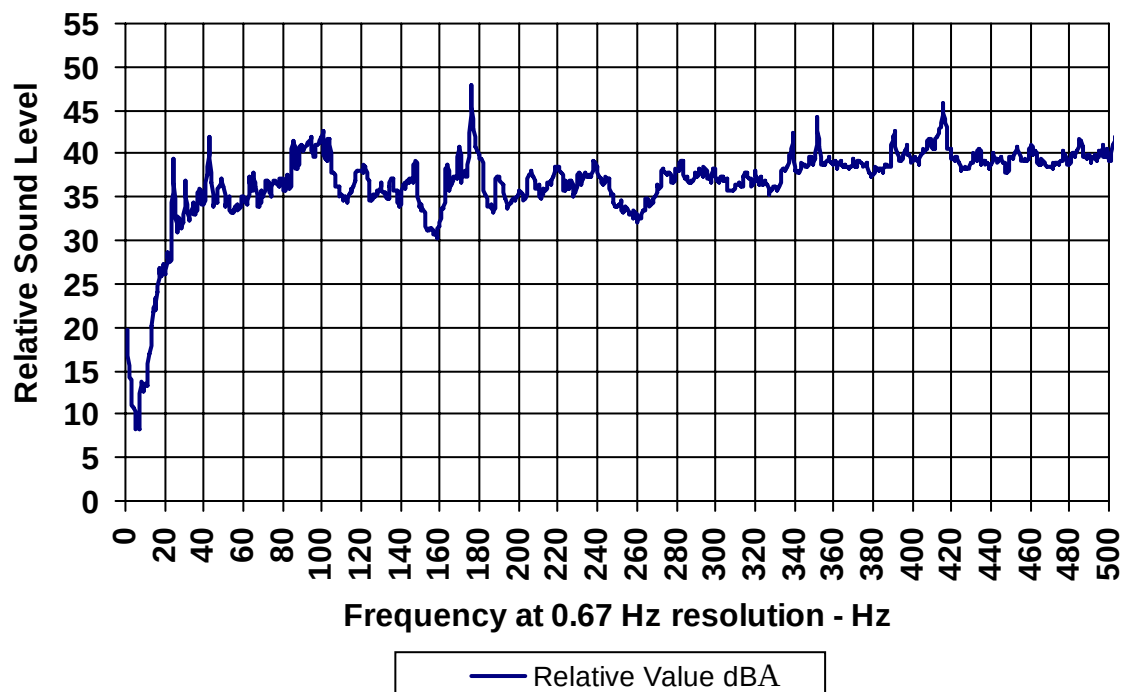


Figure H28: Evening time Spectrum for Stock Yard
measured at 8:04 PM 02/10/19

1m7sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H29:

Night time Spectrum for 12 Brisbane St
measured at 10:45 PM 02/10/19

2m21sec

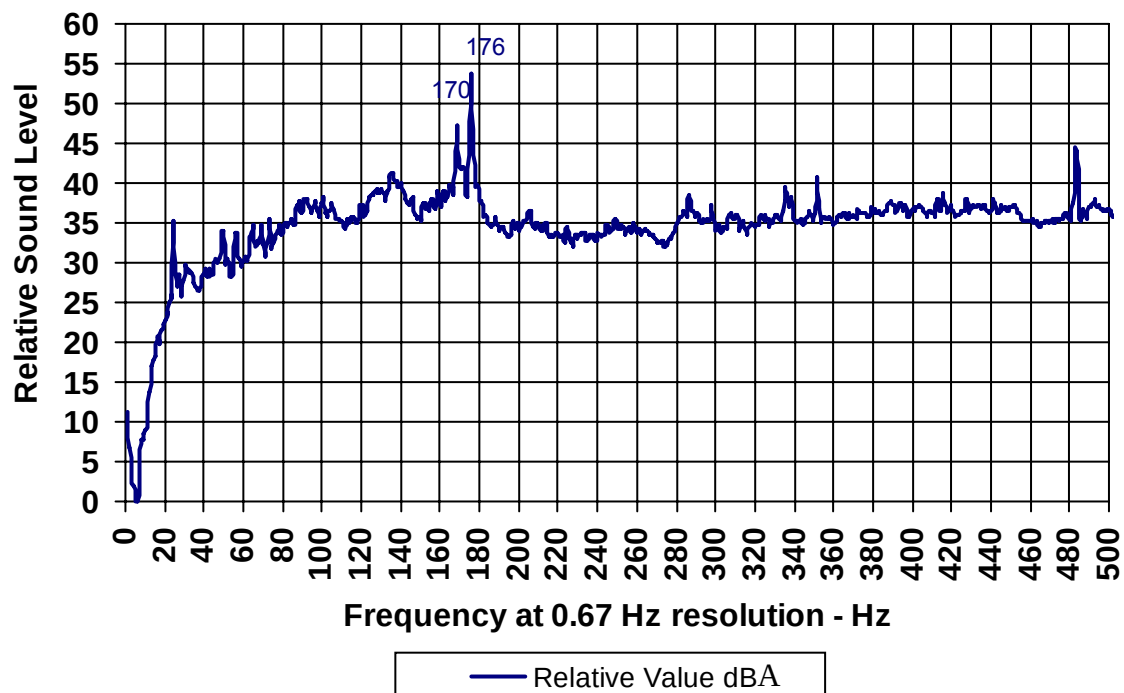
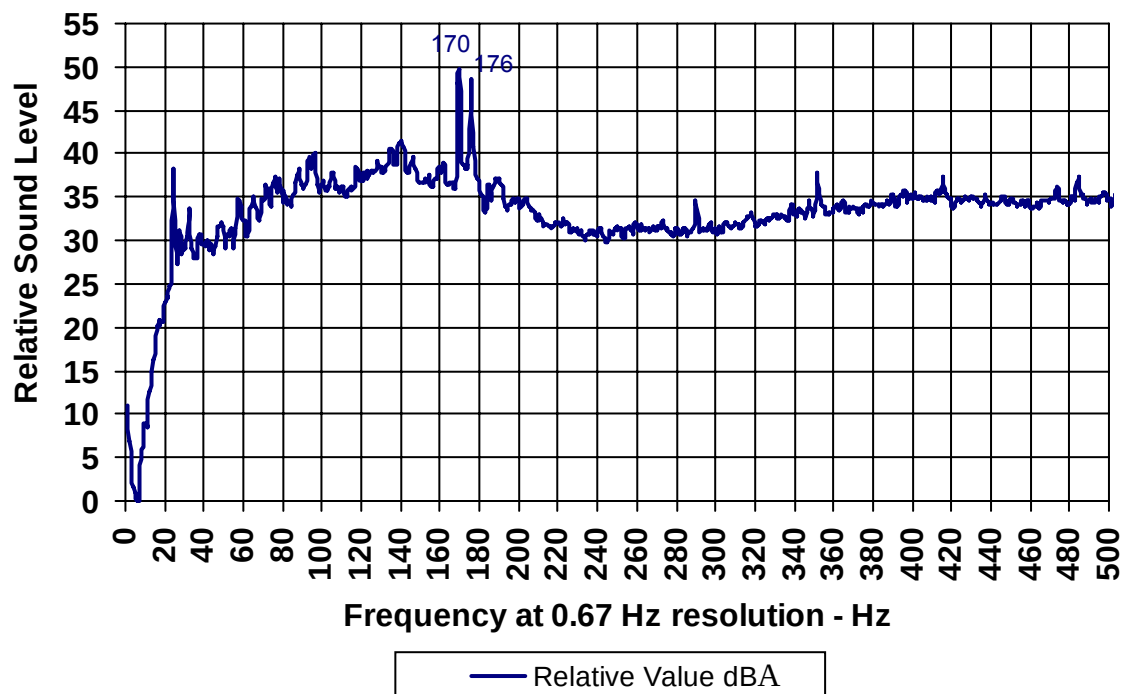


Figure H30:

Night time Spectrum for 30 Adelaide St
measured at 11:05 PM 02/10/19

2m1sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H31:

Night time Spectrum for 4 Melbourne St

measured at 10:25 PM 02/10/19

2m1sec

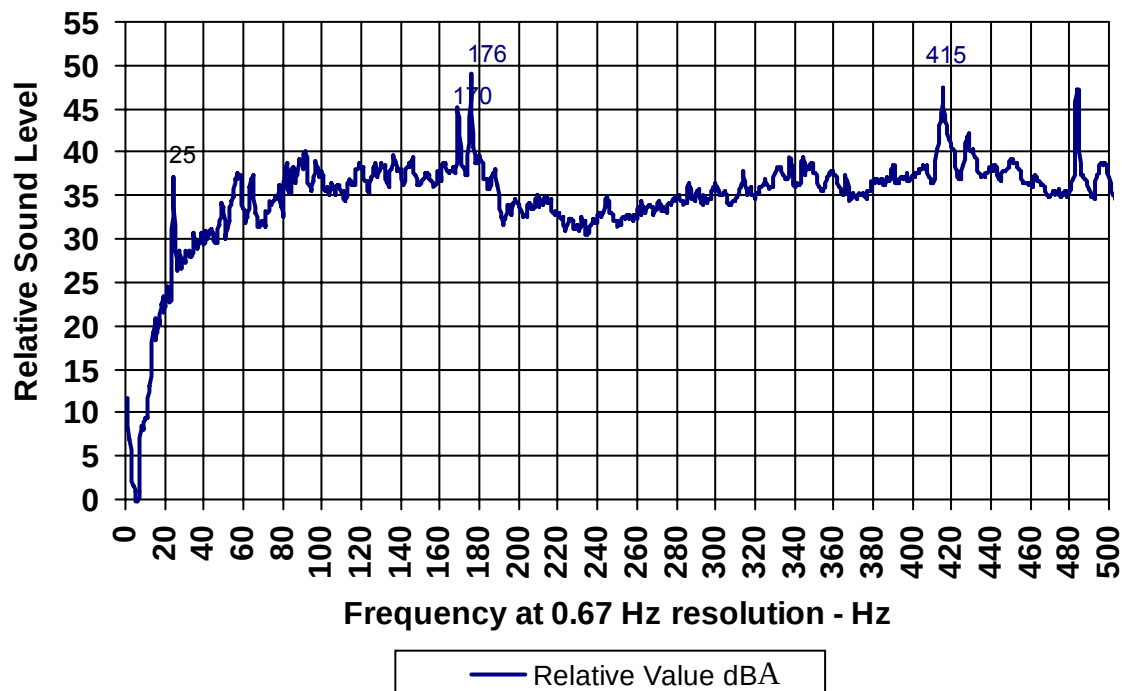
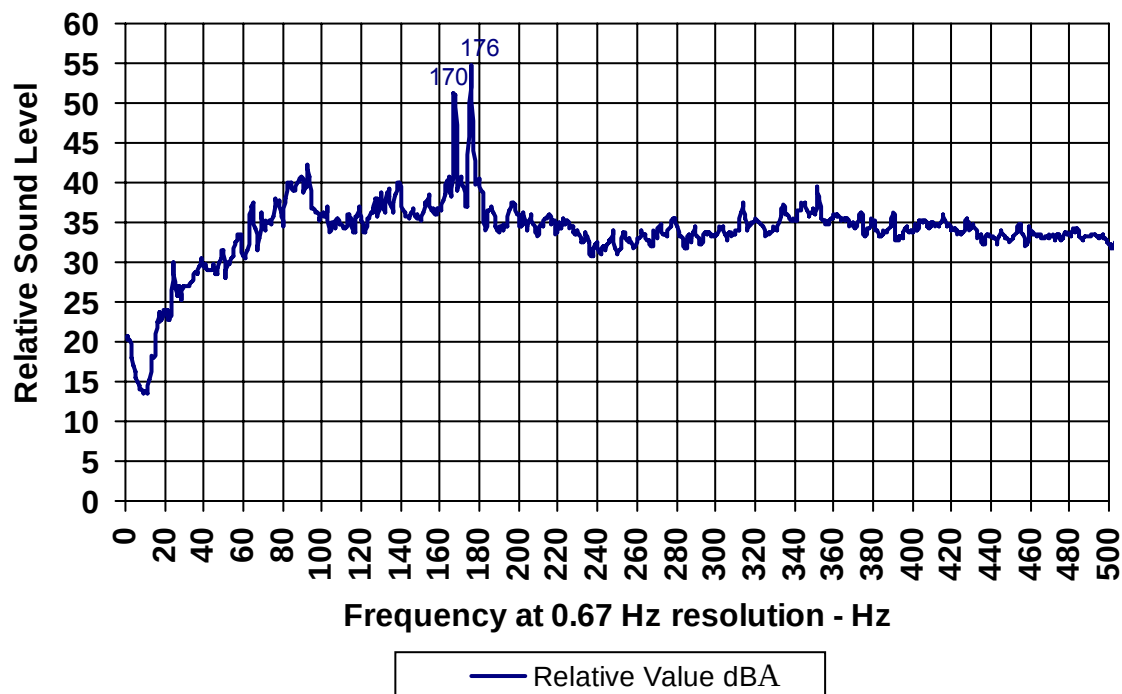


Figure H32:

Night time Spectrum for Argyle St

measured at 10:04 PM 02/10/19

1m44sec



Berrima Cement Annual Compliance Noise Study June 2019

Figure H33:

Night time Spectrum for North Fence
measured at 12:14 AM 03/10/19

2m2sec

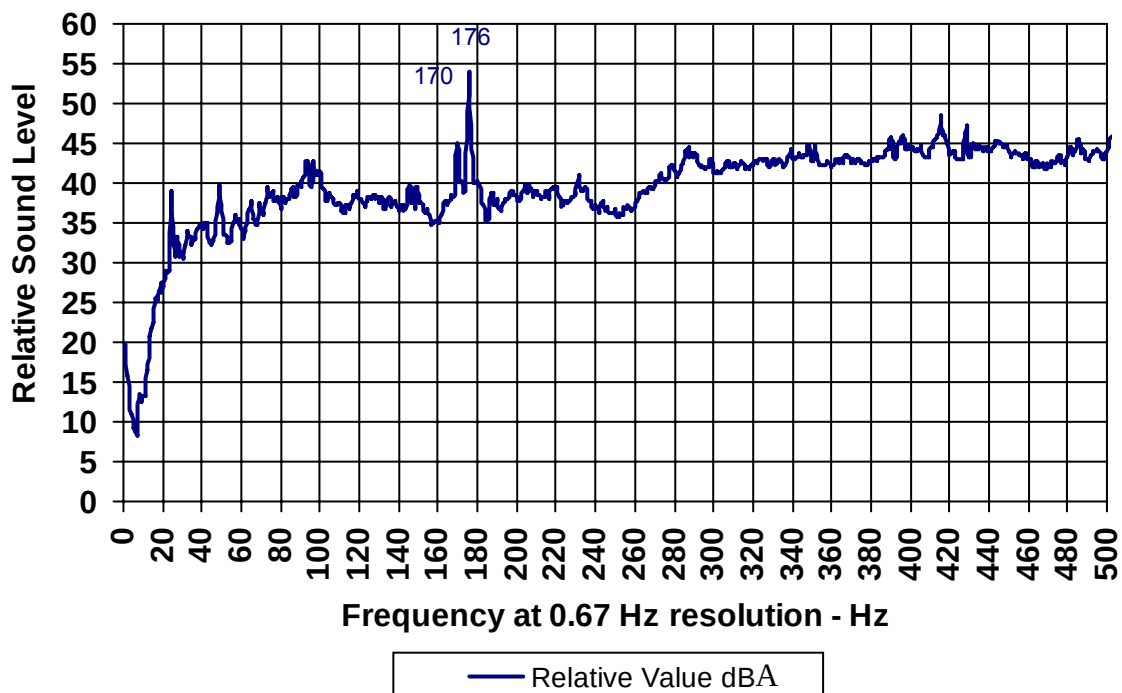
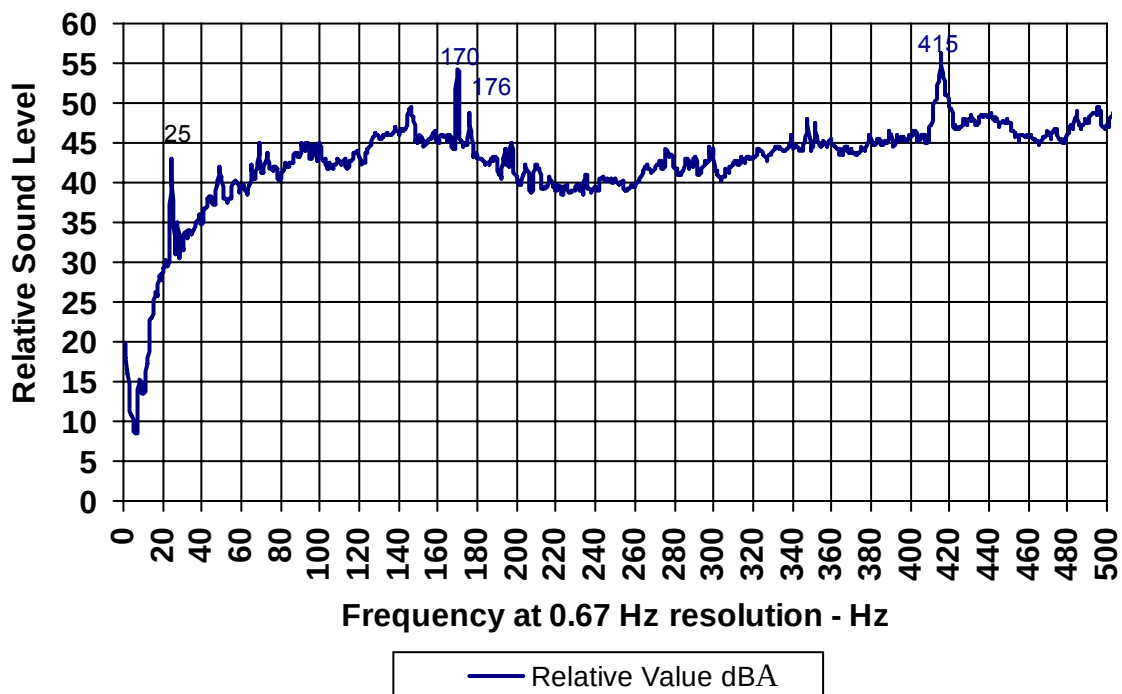


Figure H34:

Night time Spectrum for Stock Yard
measured at 12:37 AM 03/10/19

2m3sec



Appendix I: Attended monitoring results

Enviromental Noise Level Assessment Report



for :

Commencing on:

Berrima Cement Annual Compliance Noise Study - 2019 Tuesday, 10 September 2019

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	Duration weighting (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Day Time	30 Adelaide St.	Rion NA-28	200	A	900	10/09/2019 10:06 AM	52	46	48	66	17.7	Clear, sunny 10oC, wind SE to S 2 to 3 m/s to calm. Ambient 46 to 50 ave. 49. Birds, distant traffic, plant is base, occasional tone at 160 Hz band
Hourly Average												
Temp °C Wind speed (Km/hr) Direction degrees												
9 13 170												
	North Fence	Rion NA-27	119	A	900	10/09/2019 10:34 AM	61	52	55	69	14	Still Conditions industrial noise 51-52 dBA Truck Front 56 dBA Train start activity 54-55 dBA Birds ; Train Horn ; Dropping Thud Rail Squeal 60 dBA (8136 Loco) Rear Carriage 58dBA industrial surge (10:45)
Hourly Average												
Temp °C Wind speed (Km/hr) Direction degrees												
9 13 170												
	Stock Yard	Rion NA-27	120	A	900	10/09/2019 11:30 AM	72	59	62	78	15.6	Truck Front 72,72 dBA LFN present 100Hz 60dBA 125Hz 54dBA overloads on 80FSD moved up to 100FSD Vacum truck LFN?? Frontv end loader 73 dBA Still bump in road
Hourly Average												
Temp °C Wind speed (Km/hr) Direction degrees												
10 13 183												

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Day Time	Stock Yard	Rion NA-27	121	A	302	10/09/2019	11:48 AM	62	55	57	71	13.7	There was a level drop , so 5min to check La90 55 compared to 59 previous Truck over bump 67 11:45 to 11:50am
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		10	13	183									
	4 Melbourne St.	Rion NA-27	122	A	900	10/09/2019	12:17 PM	69	50	58	69	10.7	Industrial Noise from Plant ~ 52 dBA Truck 62, 67 dBA Bdouble 70 dBA Truck Start 67 dBA Truck Empty 68 dBA Car 55, 61, 63, 53 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		12	12	165									
	72 Taylor Ave ~ Outside house	Rion NA-27	123	A	900	10/09/2019	12:55 PM	80	49	67	79	12.4	Industrial Noise from Plant ~ 49 dBA Truck 81, 78, 80, 84 dBA Truck Small 71, 75, 78 dBA Truck Empty 68 dBA Car 70, 63 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		12	12	165									
	Stock Yard	Rion NA-27	192	A	900	2/10/2019	3:12 PM	67	52	55	71	15.5	
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		22	16	253									

Berrima Cement Annual Compliance Noise Study - 2019

<i>Condition</i>	<i>Description</i>	<i>Meter</i>	<i>Ref #</i>	<i>weighting</i>	<i>Duration (secs)</i>	<i>Date</i>	<i>Time</i>	<i>L01</i>	<i>L90</i>	<i>Leq</i>	<i>Lce</i>	<i>Lceq -Laeq</i>	<i>Comments:</i>
Day Time	Stock Yard	Rion NA-27	193	A	900	2/10/2019	3:33 PM	66	52	56	71	15.3	Industrial Noise ~ 52 dBA truck 73, 62
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		22	16	253									
	North Fence	Rion NA-27	194	A	900	2/10/2019	4:03 PM	56	49	51	68	17	industrial noise 49-50 dBA Plane 58 dBA Train 53 dBA
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		22	14	255									
	12 Brisbane St.	Rion NA-28	639	A	900	2/10/2019	4:23 PM	62	43	51	65	13.9	Wind calm here, possibly 1m/s above in trees. Truck pass Taylor 65 to 70, truck bump 60, car pass 48. Ambient 44, quiet 42, no WITN. 160 Hz is highest band. Car pass meter 64 to 70. Dog bark 62 to 65
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		22	14	255									
	30 Adelaide St.	Rion NA-28	640	A	900	2/10/2019	4:45 PM	53	42	45	63	18.6	Plant is background. Car traffic on Taylor barely audible. Ambient 40, kids playing & talking @ 50m, dog barking 50 @ 100m. Trucks out of gate affect 100 Hz and 125 Hz bands. Wind 2 to 3m/s SSW from site to here. ~20C, clear sky. Dogs bark 55 to 62, birds to 56. Traffic on freeway audible.
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		22	14	255									

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Day Time	4 Melbourne St.	Rion NA-27	195	A	900	2/10/2019	4:50 PM	67	46	56	67	11.1	Industrial Noise from Plant ~ 46dBA Truck 72, 68 dBA Bdoulbe 70 dBA Car local 65, 58, 63, 53, dBA Car Taylor 63, 60, 66, 68, 57, 54, 62 dBA Dog bark 53 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		22	14	255									
	72 Taylor Ave ~ Outside house	Rion NA-27	196	A	900	2/10/2019	5:28 PM	75	47	63	72	8.5	Industrial Noise from Plant ~ 45-47 dBA Truck 73, 75 dBA Dog Barking 47, 53 dBA Car 72, 73, 68 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		21	12	266									
	North Fence	Rion NA-27	13	A	900	15/10/2019	1:59 PM	56	47	50	69	19.2	
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		24	17	25									
	North Fence	Rion NA-27	14	A	900	15/10/2019	2:22 PM	56	46	50	68	18.7	Truck Taylor 50
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		24	18	22									

Berrima Cement Annual Compliance Noise Study - 2019

<i>Condition</i>	<i>Description</i>	<i>Meter</i>	<i>Ref #</i>	<i>weighting</i>	<i>Duration (secs)</i>	<i>Date</i>	<i>Time</i>	<i>L01</i>	<i>L90</i>	<i>Leq</i>	<i>Lce</i>	<i>Lceq -Laeq</i>	<i>Comments:</i>
Day Time	Stock Yard	Rion NA-27	15	A	900	15/10/2019	3:04 PM	60	52	55	71	16.8	Road Noise Taylor (High Whisle) Rail Movement Train Horn 56 dBA
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		24	18	14									
	North Fence	Rion NA-27	16	A	900	1/11/2019	1:30 PM	57	46	51	69	18.2	Truck Taylor 50 NE Wind Slight
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		28	18	49									
	Stock Yard	Rion NA-27	17	A	900	1/11/2019	2:03 PM	66	53	57	73	15.9	
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		28	19	47									
	Stock Yard	Rion NA-27	18	A	900	1/11/2019	3:33 PM	60	53	55	72	17.3	All Industry
Hourly Average													
		<i>Temp °C</i>	<i>Wind speed (Km/hr)</i>	<i>Direction degrees</i>									
		27	25	51									

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Day Time	North Fence	Rion NA-27	19	A	900	6/11/2019	3:11 PM	57	48	50	68	17.8	Still conditions Truck Taylor 50, 50 Ambient 48
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		22	27	272									
	Stock Yard	Rion NA-27	20	A	900	6/11/2019	4:24 PM	64	53	59	79	19.9	Wind Gusting Front end Loader 57 dBA Car 58 dbA Machine in Yard SW 55 dBA tonal 58 @125 Hz 60 -62 AP Wav 84 for this event 4:37pm
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		22	27	271									
	North Fence	Rion NA-27	21	A	900	19/11/2019	12:31 PM	57	49	52	68	16.5	Still conditions Truck Taylor 55 Truck Local 56, 59 dBA Ambient 51
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		30	28	251									
	Stock Yard	Rion NA-27	22	A	900	19/11/2019	1:18 PM	68	54	58	74	15.9	Ambient 55 dBA Truck 70, 69, 65, 63, 59
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		31	25	248									

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Evening Time	North Fence	Rion NA-27	199	A	900	2/10/2019	7:37 PM	53	49	51	67	16.5	industrial noise 50 dBA Truck Taylor 51,53, 51 dBA Train 52 dBA Dog in Village (just) Nor FFT files 529,28,27
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		12	1	239									
	Stock Yard	Rion NA-27	200	A	900	2/10/2019	8:04 PM	61	56	58	72	14	Industrial Noise ~ 52 dBA Train idling 57-58- 59 dBA Train increasing revs 60 pulling out Front End loader working SW Reversing Beacon
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		10	0	176									
	4 Melbourne St.	Rion NA-27	1	A	900	2/10/2019	8:28 PM	64	45	51	66	14.7	Industrial Noise from Plant ~ 46dBA Thumps from works Car local 70 dBA Car Taylor 61 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		10	0	176									
	72 Taylor Ave ~ Outside house	Rion NA-27	2	A	900	2/10/2019	8:48 PM	70	46	57	69	11.7	Industrial Noise from Plant ~ 45-47 dBA Thumping from works Car 72, 72,70,67,77 dBA Gate Alarm
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		10	0	176									

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Evening Time	30 Adelaide St.	Rion NA-27	3	A	900	2/10/2019	9:09 PM	58	42	46	63	16.6	Industrial Noise from Plant ~ 42 dBA Dog Barking 52 dBA Freeway heard
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		9	0	45									
	12 Brisbane St.	Rion NA-27	4	A	900	2/10/2019	9:28 PM	52	43	45	62	17	Industrial Noise from Plant ~ 42-43 dBA Car Taylor 42,49 dBA Tonal noise 160 Hz 40 dB Nor FFT 34-37S Freeway heard Still Conditions
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		9	0	45									
	Argyle St, 30m N of Taylor Ave.	Rion NA-27	5	A	900	2/10/2019	9:47 PM	60	46	50	62	11.5	Nor FFT 38-41S some tonal aspects Freeway heard Voices from corner house
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		9	0	45									
Night Time	Argyle St, 30m N of Taylor Ave.	Rion NA-27	6	A	900	2/10/2019	10:04 PM	62	44	50	61	10.7	Nor FFT 38-41S some tonal aspects Car 60, 54, 57 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		8	0	113									

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Night Time	4 Melbourne St.	Rion NA-27	7	A	900	2/10/2019	10:25 PM	60	45	50	63	13.6	Industrial Noise from Plant ~ 46 dBA Nor FFT 43-46S 2min recording Car 62 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		8	0	113									
	12 Brisbane St.	Rion NA-27	8	A	900	2/10/2019	10:45 PM	54	45	47	62	14.1	Nor FFT 48-50S Car 59 Taylor dBA Truck 59 dBA Highway noise detected Tonal @ 160 Hz
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		8	0	113									
	30 Adelaide St.	Rion NA-27	9	A	900	2/10/2019	11:05 PM	51	42	45	63	17.8	Nor FFT 52-54S 51 S normal measurement Car 59 Taylor dBA Truck 48 dBA Truck taking off from lower gate 57 dBA Air brakes distant (Highway?) Tonal @ 160 Hz
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		7	0	99									
	72 Taylor Ave ~ Outside house	Rion NA-27	10	A	900	2/10/2019	11:25 PM	67	49	54	67	12.8	Extra measurement Industry noise ~ 50 dBA Nor FFT 60-61S 59 S normal measurement (15min) Car 76 dBA Truck 75, 79, 87, 83 dBA
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		7	0	99									

Berrima Cement Annual Compliance Noise Study - 2019

Condition	Description	Meter	Ref #	weighting	Duration (secs)	Date	Time	L01	L90	Leq	Lce	Lceq -Laeq	Comments:
Night Time	North Fence	Rion NA-27	11	A	900	3/10/2019	12:14 AM	58	54	55	67	11.8	Industry noise ~ 55 dBA Nor FFT 3-6S 251003 S normal measurement (2min)
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		6	0	43									
	Stock Yard	Rion NA-27	12	A	900	3/10/2019	12:37 AM	62	59	60	72	11.8	Industry noise ~ 55 dBA Nor FFT 8-10S 251003 -7S normal measurement (2min)
Hourly Average													
		Temp °C	Wind speed (Km/hr)	Direction degrees									
		6	0	43									
		Instrument : Rion NA-27	Serial No 00270216	Calibrate Date 5/08/2019		Measurement Date :		Pre Cal :		Post Cal :			
						10/09/2019		93.9		93.9			
						2/10/2019		94		93.8			
						3/10/2019		94		93.8			
						15/10/2019		94		93.8			
						1/11/2019		94		93.7			
						6/11/2019		94		93.8			
						19/11/2019		93.9		93.7			
		Rion NA-28	860028	28/08/2019		10/09/2019		94		94			
						2/10/2019		94		94			

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