



*Adelaide Brighton Cement Ltd*

ABN 96 007 870 199

## ANNUAL NOISE MANAGEMENT REPORT FOR BIRKENHEAD WORKS

---

### **COMPLIANCE DATE: 15/02/19 – Annual - 2018 EPA Licence 1126: Noise Management Plan (U-787)**

**Licensed site: Adelaide Brighton Cement, Birkenhead Works**

**62 Elder Road, Birkenhead, SA 5015**

**Date of Submission: 15 February 2019**

**Version Number: 1**



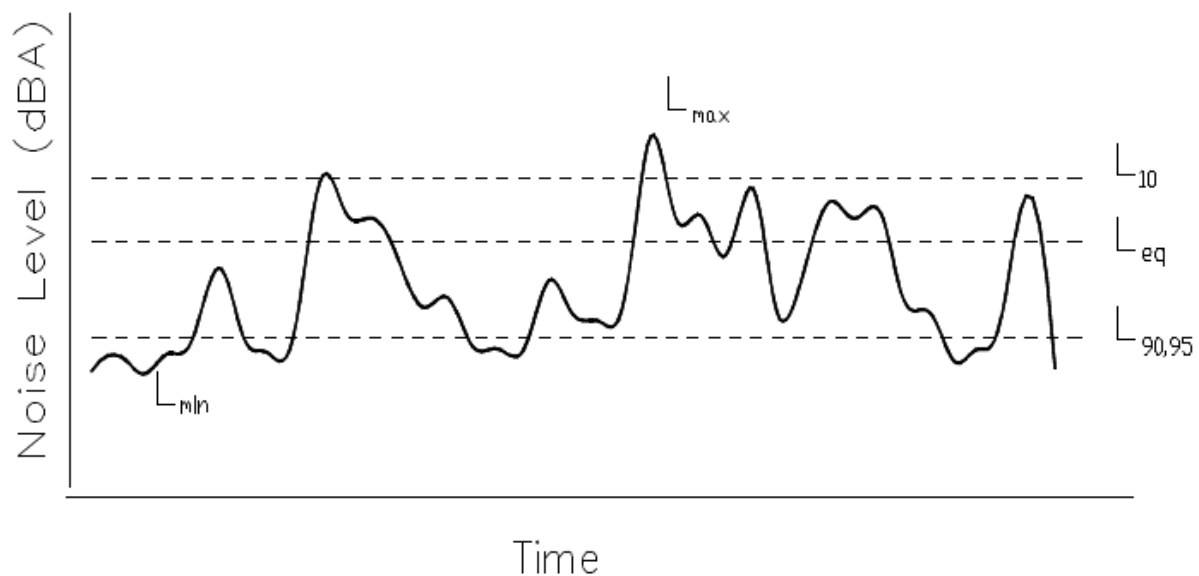
Report Submitted by: Environmental Engineer

Certified by: Compliance Manager

*I certify that to the best of my knowledge and ability all the information in this report is a true and accurate reflection of the regulatory monitoring performed.*

## Glossary of acoustic terminology

<b>dB(A)</b>	A unit of measurement, decibels(A), of sound pressure level which has its frequency characteristics modified by a filter ("A-weighted") so as to more closely approximate the frequency response of the human ear.
<b>L<sub>1</sub></b>	The noise level which is equalled or exceeded for 1% of the measurement period. L <sub>1</sub> is an indicator of the impulse noise level, and is used in Australia as the descriptor for intrusive noise (usually in dBA).
<b>L<sub>10</sub></b>	The noise level which is equalled or exceeded for 10% of the measurement period. L <sub>10</sub> is an indicator of the mean maximum noise level, and is used in Australia as the descriptor for intrusive noise (usually in dBA).
<b>L<sub>90</sub></b>	The noise level which is equalled or exceeded for 90% of the measurement period. L <sub>90</sub> is an indicator of the mean minimum noise level, and is used in Australia as the descriptor for background or ambient noise (usually in dBA).
<b>L<sub>eq</sub></b>	The equivalent continuous noise level for the measurement period. L <sub>eq</sub> is an indicator of the average noise level (usually in dBA).
<b>L<sub>max</sub></b>	The maximum noise level for the measurement period (usually in dBA).



**Note:** *The subjective reaction or response to changes in noise levels can be summarised as follows:*

A 3 dB(A) increase in sound pressure level is required for the average human ear to notice a change; a 5 dB(A) increase is quite noticeable and a 10 dB(A) increase is typically perceived as a doubling in loudness

**Monitoring Objective**

The annual report will include where applicable:

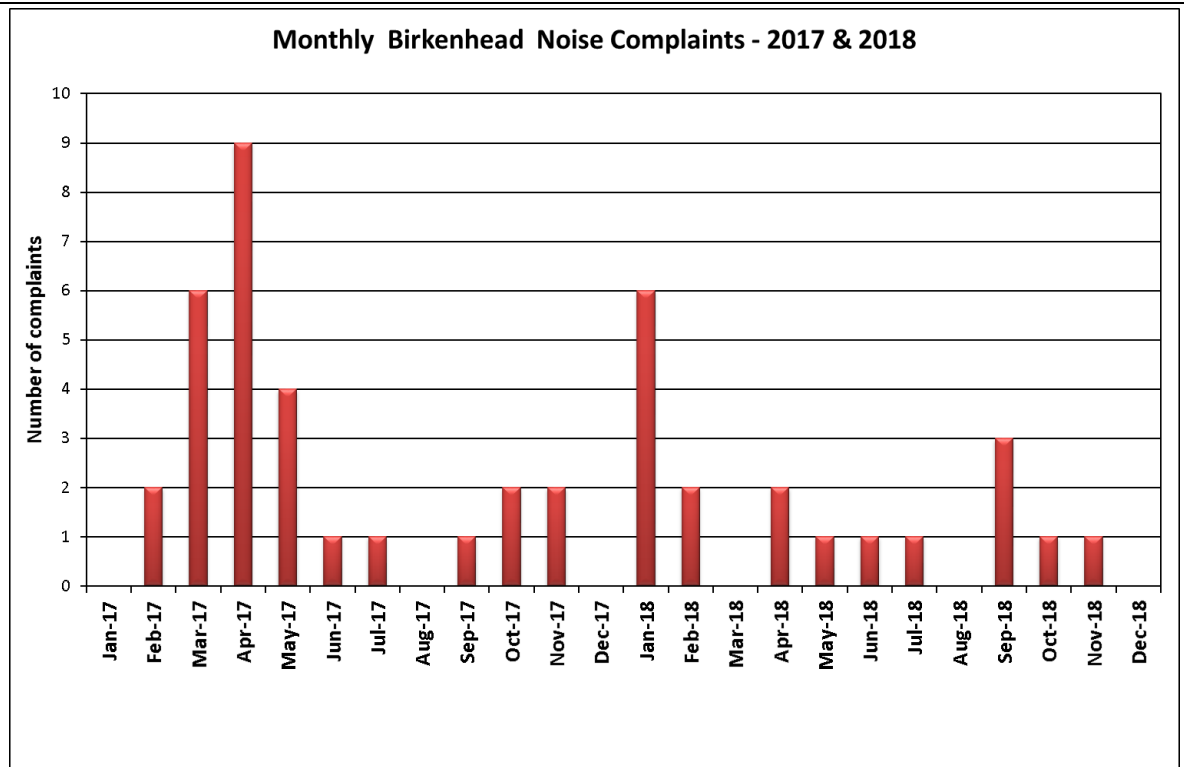
- Graph of noise complaints received for the year and trend report in noise complaints compared with the previous year
- Summary of noise monitoring in the local community and an assessment of results against previous monitoring results to identify trends in noise levels.
- Summary of noise minimisation actions and overall effectiveness
- Details of other noise minimisation activities
- Assessment of the effectiveness of this noise management plan

**Monitoring Plan**

This monitoring report complies with the Noise Management Plan approved on 16 August 2018 by the SA EPA.

The Plan is available on the ABC Birkenhead Community Website:  
<http://www.birkenheadcommunity.com.au/>

**Graph of noise complaints for 2017 & 2018**



2017 Complaints summary

- 28 complaints total (27 related to ABC)
- 1 complaint not related to Birkenhead site

2018 Complaints summary

- 18 complaints total (13 related to ABC)
- 5 complaints not related to Birkenhead site

52% Reduction in noise complaints related to ABC achieved in 2018

**Community based noise monitoring & assessment against previous year**

**Site Noise Criteria**

Noise from the activities undertaken at the ABC Birkenhead site is subject to the provisions of the Environment Protection (Noise) Policy 2007 (Noise EPP). The Noise EPP outlines Noise Goals which provide one method for demonstrating compliance with the General Environmental Duty under Section 25 of the Environment Protection Act 1993 (the Act).

As such, the following Indicative Noise Levels (INLs) apply to ABC's operations:

	Indicative Noise Levels ( $L_{eq}$ , dB(A))	
	Day-time (7am to 10pm)	Night-time (10pm to 7am)
Residential zone – Policy Area 57 (Le Fevre Peninsula East)	57	49
Residential zone – Policy Area 65 (Restricted Residential)	57	49

ABC has commissioned Vipac to undertake regular attended and unattended noise monitoring surveys in the community to gain an understanding of how noise from the site impacts the community. Attended measurements have generally been conducted both during the day-time and night-time periods (as defined by the Noise EPP), and defined measurement positions have been established allowing for trends in noise levels at each location to be established over time.



Location of attended noise measurement locations

## Attended 2018 and 2017 Day/night Noise Survey Results Using LAeq

The following tables contain the attended L<sub>Aeq</sub> noise measurements as reported in the Vipac, 2017 and 2018 noise survey reports. The L<sub>Aeq</sub> descriptor is the equivalent continuous noise level for the measurement period and is an indicator of the average noise level.

### Attended Day/Night L<sub>Aeq</sub> Noise levels for 2017 and 2018

Measurement Location	Criterion dB(A)	Day-time L <sub>Aeq</sub> Noise Level (dB(A))			Criterion dB(A)	Night-time L <sub>Aeq</sub> Noise Level (dB(A))		
		2017	2018	Difference		2017	2018	Difference
R2	57	59	57	-2	49	57	56	-1
R3	57	57	55	-2	49	51	50	-1
R4	57	50	46	-4	49	45	45	0
R5	57	54	51	-3	49	54	52	-2
R6	57	49	41	-8	49	47	46	-1
R8	57	55	47	-8	49	51	49	-2
R9	57	54	43	-11	49	45	43	-2
R10	57	75	*	-	49	56	51	-5
R11	57	57	45	-12	49	45	43	-2
R12	57	59	55	-4	49	58	54	-4
R13	57	44	42	-2	49	47	44	-3
R14	57	47	40	-7	49	44	44	0
R15	57	58	55	-3	49	55	54	-1
R16	57	77	*	-	49	71	55	-16
R17	57	59	51	-8	49	49	44	-5
R18	57	51	41	-10	49	51	45	-6
N1	57	57	52	-5	49	54	49	-5
N2	57	53	51	-2	49	52	51	-1
N3	57	58	51	-7	49	53	52	-1

\* Meaningful measurements could not be taken at locations R10 and R16 due to heavy traffic on Victoria Road.

### Attended 2017 and 2018 Day/Night Noise Survey Results Using LA90

The L<sub>A90</sub> descriptor is the noise level that is equalled or exceeded for 90% of the measurement period and is used as the descriptor for background or ambient noise, as it reduces the influence of short term, extraneous noise sources from the results such as intermittent traffic, however it does not always completely remove all extraneous sources.

ABC's noise emission profile is characterised as steady state (i.e. without significant modulation or impulsive components), and therefore the L<sub>A90</sub> descriptor provides a good representation of the level of noise contributed by ABC's operations to the overall noise level present in the community, by minimising the influence of traffic from nearby major arterial roads.

The following table compares the 2018/2017 L<sub>A90</sub> noise measurements as reported in the Vipac, 2017 and 2018 noise survey reports, and enables a better comparison of noise trends over the last two years.

### Attended Day/Night L<sub>A90</sub> Noise levels for 2017 and 2018

Measurement Location	Criterion dB(A)	Day-time L <sub>A90</sub> Noise Level (dB(A))			Criterion dB(A)	Night-time L <sub>A90</sub> Noise Level (dB(A))		
		2017	2018	Difference		2017	2018	Difference
R2	57	56	54	-2	49	55	55	0
R3	57	47	47	0	49	49	48	-1
R4	57	42	39	-3	49	44	43	-1
R5	57	51	49	-2	49	52	51	-1
R6	57	44	37	-7	49	45	44	-1
R8	57	52	46	-6	49	50	47	-3
R9	57	44	37	-7	49	43	40	-3
R10	57	64	*	-	49	50	49	-1
R11	57	50	38	-12	49	42	39	-3
R12	57	55	50	-5	49	54	51	-3
R13	57	41	40	-1	49	46	43	-3
R14	57	43	36	-7	49	42	40	-2
R15	57	55	52	-3	49	54	53	-1
R16	57	62	*	-	49	59	54	-5
R17	57	49	42	-7	49	47	43	-4
R18	57	46	38	-8	49	49	41	-8
N1	57	51	46	-5	49	51	48	-3
N2	57	49	47	-2	49	51	50	-1
N3	57	54	48	-6	49	52	51	-1

\* Meaningful measurements could not be taken at locations R10 and R16 due to heavy traffic on Victoria Road

#### Summary of Results:

#### 2018 Noise levels

In general, 2018 noise levels comply with the day-time criterion applicable under the Noise EPP, with the exception of locations R10 and R16 that were heavily influenced by traffic.

For most noise sensitive receivers, night-time noise levels also meet the criterion applicable under the Noise EPP. Where noise levels exceed the 49dB(A) night-time criterion, the exceedance is generally less than 3dB(A) which subjectively, is a 'just noticeable change' when compared with the criterion level.

## Comparison of 2018 against 2017 Noise levels

In general, 2018 noise measurements show decreases between 0-3dB(A) and were observed at most locations close to or moderately distant from the plant; higher decreases were observed at greater distances from the plant but these decreases are likely due to a greater influence of extraneous noise sources on the 2017 measurements compared with the 2018 survey.

In particular, noise levels at night showed a reasonably consistent decrease across all attended measurement locations.

## Noise Abatement Projects

Summary of noise abatement projects completed under the ABC Environmental Improvement Program 1126 EIP Version 3: 31 January – 30 June 2018.

1. In June 2018, the APA Group installed a prefabricated wider spool to reduce restrictions within the Gas Train system as their preferred noise abatement measure.



*Noise intensity reduced by 6 dB(A) at the source (Vipac Engineers report: 50B-18-0036-TRP-805631-2)*

2. ABC designed, manufactured and installed a new 75 dB rated silencer in April 2018.



*Noise intensity reduced by 4 dB(A) at the source (Vipac Engineers report: 50B-18-0036-TRP-805631-2)*

Note: measurement included several background sources within the vicinity

3. ABC refurbished internal silencer, sealed all openings and coated the fan housing with Decidamp, a constrained layer/visco-elastic damping material, designed to reduce structural vibration and sound transmission within light gauge materials during the March 2018 shutdown.



*Noise intensity reduced by 7 dB(A) at the source (Vipac Engineers report: 50B-18-0036-TRP-805631-2)*

Note: measurement included several background sources within the vicinity.

4. In late 2017, ABC replaced the entire gearbox assembly on the 4B Air slide transport system located at the top of 20,000 T Blending silo (adjacent main plant tower).



*Noise intensity reduced by 9 dB(A) at the source (Vipac Engineers report: 50B-18-0036-TRP-805631-2)*

Note: measurement included several background sources within the vicinity.

## Other Noise Minimisation Activities

### January 2018 Shutdown Noise Management

- All potential high noise impacts tasks assessed in adjacent residential locations – alternate methods applied or tasks ceased if it had potential to impact
- Daily formal communications and toolbox meeting involving all site personnel and contractors, including:
  - All complaints raised & relevant actions taken
  - Awareness of potential impacts when performing tasks
  - Assessment processes for high impact tasks – typically measure at residential locations
  - Alternate methods used and tasks not to be performed
  - 10:00 p.m. curfew for high impact tasks
- Advertising of shutdown information in the local messenger and on community website

### Noise Management Plan

An EPA approved Noise Management Plan has been developed that details how the Birkenhead site minimises noise impacts on the local community.



<p><b>Noise Monitoring Reports</b></p>	<p><b>Vipac Acoustic Engineers &amp; Scientists noise reports</b></p> <ul style="list-style-type: none"> <li>• Vipac report “Birkenhead Attended Noise Survey”, June 2018, 50B-18-0036-TPR-905659-2, 10 August 2018</li> <li>• Vipac Report “2018 Environmental Noise Model Update”, 50B-18-0036-TPR-805631-2, 10 August 2018</li> <li>• Vipac Report “Birkenhead Noise Emissions Profile Summary 50B-18-0036-TPR-805507-2, 10 August 2018</li> <li>• Vipac Acoustic Engineers &amp; Scientists were engaged to conduct a comprehensive site assessment over December 2018 to February 2019, which includes: <ul style="list-style-type: none"> <li>○ Site noise intensity measurements of all major noise sources</li> <li>○ Identification of further potential noise abatement projects</li> <li>○ Update the source intensity sound model, including the incorporation of the completed four noise projects from the ABC Environmental Improvement Program 1126 EIP Version 3 - 31 January to 30 June 2018</li> </ul> </li> </ul>
<p><b>Plan Effectiveness</b></p>	<p>The continuous improvement approach to managing noise emissions that is embodied in the Noise Management Plan is effective. This evidenced by a reduction in noise complaints and off-site noise levels between 2017 and 2018.</p> <p>A 52% reduction in noise complaints between 2017 and 2018 has been achieved.</p> <p>In general, 2018 noise measurements show decreases between 0-3dB(A) at most locations close to or moderately distant from the plant; higher decreases were observed at greater distances from the plant but these decreases are likely due to a greater influence of extraneous noise sources on the 2017 measurements compared with the 2018 survey.</p> <p>In general, 2018 noise levels comply with the day-time criterion applicable under the Noise EPP.</p> <p>For most noise sensitive receivers, night-time noise levels also meet the criterion applicable under the Noise EPP. Where noise levels exceed the 49 dB(A) night-time criterion, the exceedance is generally less than 3 dB(A) which subjectively, is a ‘just noticeable change’ as compared with the criterion level.</p> <p>In particular, noise levels at night showed a reasonably consistent decrease across all attended measurement locations from 2017 levels.</p>