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Adelaide Brighton Cement Ltd
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18 May 2016

Ref: 50B-16-0007-TPR-799629-1

Attention: Tim Radimissis

1 INTRODUCTION

Vipac Engineers and Scientists were engaged by Adelaide Brighton Cement (ABC) to undertake a routine environmental noise survey at residential locations within proximity of the ABC Birkenhead plant during typical operations. The attended noise measurements were conducted on the 12th April and the 10th May 2016.

2 REFERENCES

- [1] Environment Protection (Noise) Policy 2007, South Australian government.
- [2] Guidelines for the use of the Environment Protection (Noise) Policy 2007, June 2009, Environment Protection Authority (EPA).
- [3] Vipac Report: 50B-16-0007-TRP-799543-2 – ABC Noise Survey February 2016 (Pre-noise abatement).
- [4] Vipac Report: 50B-16-007-TRP-473094-1 – Noise Modelling Prediction.
- [5] Map source – Google Earth, satellite image taken 3rd March 2016.
- [6] Port Adelaide Enfield (City) Development Plan, Consolidated 21 April 2016, Development Act 1993.

3 EQUIPMENT

The attended noise measurements were conducted during daytime and night-time periods using the following instruments:

- Brüel & Kjaer Type 1 Hand-held Analyser model 2250 Sound Level Meter (Serial No. 3002841, last calibrated on 4th Feb 2016),
- 01dB Duo Type 1 sound level meter (serial number: 10303 last calibrated on 14 October 2014).

Both sound level meters used in attended noise measurements were fitted with approved windshields. All sound level meters used in the attended measurements were calibrated before and after measurements with an acoustic pistonphone calibrator (LDCA250 serial number: 2815, last calibrated on 5 February 2016) and no or negligible drift was found in the meters.

18 May 2016



4 ASSESSMENT CRITERIA

The Environment Protection (Noise) Policy 2007 (EPA) [1] specifies the maximum allowable noise levels based on the time of day and land use, applicable at the most noise sensitive premises. These assessment criteria are determined based on the scheduled maximum noise levels for time of day and land use.

4.1 EXCERPT FROM THE CURRENT EPA POLICY 2007 (REF [2])

Part 1 – Section 5 – Indicative noise levels

(1) ... the indicative noise level for a noise source is to be determined as follows:

(a) where –

- i. the land uses principally promoted by the relevant Development Plan provisions for the noise source fall within a land use category specified in Table 1 in subclause (9); and
- ii. the land uses principally promoted by the relevant Development Plan provisions for the noise-affected premises fall within the same category as those principally promoted by the relevant Development Plan provisions for the noise source,

by reference to indicative noise factors set out in Table 1;

(b) in any other case – by reference to indicative noise factors set out in Table 2 in subclause (9).

(2) When measurements to determine the source noise level (continuous) are taken –

- (a) between 7:00am and 10:00pm on the same day – an indicative noise factor used to determine the indicative noise level for the noise source is found in Table 1 or 2 in the column under the heading “day”; or
- (b) between 10:00pm on one day and 7:00am on the following day – an indicative noise factor used to determine the indicative noise level for the noise source is found in Table 1 or 2 in the column under the heading “Night”.

(5) ...if the land uses principally promoted by the relevant Development Plan provisions for the noise source and those principally promoted by the relevant Development Plan provisions for the noise-affected premises do not all fall within a single land use category, the indicative noise level is the average of the indicative noise factors for the land use categories within which those land uses fall.

4.2 INDICATIVE NOISE FACTORS

From the Port Adelaide Enfield Development Plan [6], the residential receivers are located within the zone designated as “Residential”, whereas the Adelaide Brighton Cement Birkenhead Plant is located in the zone designated “Industry”.

Using the information contained within the excerpts detailed in Section 0, the indicative noise levels for the residential locations are detailed in Table 4-1. The average of the ‘General Industry’ and ‘Residential’ land use category indicative noise levels is presented.

Table 4-1: Indicative Noise Level

	Day	Night
Indicative noise level – dB(A)	59	50

4.3 ADJUSTMENT FOR CHARACTERISTICS

Note that for a noise containing a characteristic (tonal, impulsive, low frequency or modulating), the following adjustments are to be made to the source noise level:

- Noise containing 1 characteristic; a 5dB(A) penalty must be added to the noise level (continuous),
- Noise containing 2 characteristics; and 8dB(A) penalty must be added to the noise level (continuous),
- Noise containing 3 or 4 characteristics, a 10dB(A) penalty must be added to the noise level (continuous).

5 METHODOLOGY

5.1 MEASUREMENT LOCATIONS

Vipac conducted attended daytime and night-time measurements at 16 residential locations in accordance with the Environment Protection (Noise) Policy 2007 [1]. These locations are listed in Table 5-1, labelled R2-R18 (excluding R7) and displayed on Figure 5-1.

Table 5-1 Unattended and Attended Measurement Locations

Measurement Location	Location Address/ Description
R2	Corner of Alfred St and Hargrave St, Peterhead
R3	Adjacent to 145 Hargrave St, Peterhead (facing Fletcher Rd)
R4	Corner of Robert St and Hargrave St, Birkenhead
R5	Adjacent to 23 Levi St, Birkenhead
R6	Adjacent to 19 Craigie St, Birkenhead
R8	Adjacent to 39 Mary St, Peterhead
R9	Corner of Wills St and Whyte St, Peterhead
R10	Corner of Olive St and Victoria Rd, Largs Bay
R11	Adjacent to 158 Fletcher Rd, Largs Bay (facing east along Olive St)
R12	Adjacent to 33 Hilton St, Birkenhead
R13	Adjacent to 28 Whyte St, Peterhead (facing east down Matilda St)
R14	Adjacent to 15 Waverley St, Largs Bay
R15	Adjacent to 9 Walton St, Peterhead
R16	Adjacent to 77 Victoria Rd, Birkenhead
R17	Corner of Fletcher Rd and Rose St, Birkenhead (adjacent to 53 Fletcher Rd)
R18	Adjacent to 20 Fletcher Rd, Birkenhead (In the park)



Figure 5-1: Attended noise measurement locations near Birkenhead plant [5]

6 NOISE SURVEY

6.1 ATTENDED MEASUREMENT SURVEY

A noise survey was undertaken at 16 residential receiver locations, in order to capture the existing noise levels (and identify the dominant noise sources) in the vicinity. Table 6-1 and Table 6-2 provide a summary of the daytime and night time attended measurements respectively.

6.1.1 DAYTIME MEASUREMENT RESULTS

Table 6-1: Summary of Daytime Attended Measurements at Residential Receivers

Measurement Location	Date/Time	Criteria dB(A)	Noise Level (L _{A90}) dB(A)	Noise Level (L _{Aeq}) dB(A)	Exceedance (dBA)	Wind Speed (m/s)	Wind Direction (deg)
R2	12/04/16 12:53	59	55	58	—	5.3	225
R3	12/04/16 13:43	59	44	53	—	6.1	247.5
R4	12/04/16 14:08	59	41	53	—	6.7	247.5
R5	12/04/16 12:40	59	45	50	—	4.2	225
R6	12/04/16 13:08	59	39	45	—	5.3	225
R8	12/04/16 13:31	59	47	50	—	6.1	247.5
R9	12/04/16 14:45	59	41	46	—	7.8	225
R10	12/04/16 15:50	59	56	69	—	8.9	247.5
R11	12/04/16 14:10	59	46	53	—	6.7	247.5
R12	12/04/16 12:22	59	52	63	—	4.2	225
R13	12/04/16 14:27	59	42	49	—	6.1	225
R14	12/04/16 14:26	59	42	51	—	6.1	225
R15	12/04/16 13:13	59	50	53	—	5.3	225
R16	12/04/16 12:02	59	58	72	—	3.1	247.5
R17	12/04/16 12:39	59	41	48	—	4.2	225
R18	12/04/16 12:01	59	39	47	—	3.1	247.5

It is noted that noise from the ABC plant was audible at the receiver locations in proximity to the plant, including R2, R5, R12, R8, R15 and R10. The daytime measurements show that the relevant environmental noise criteria for the daytime period has been achieved. At locations R10, R12, and R16, the measurements were affected by high density traffic noise along Victoria Rd respectively. However, for R10, R12 and R16 the background levels as demonstrated by the L_{A90} measurements were more than 10 dB below the L_{Aeq}, indicating that the L_{Aeq} exceedance was most likely due to road traffic activities. Taking into account the effects of extraneous noise on the recent attended measurement survey, we note that the levels measured are generally congruent with the levels observed during the most recent previous surveys.

6.1.2 NIGHT-TIME MEASUREMENT RESULTS

Table 6-2: Summary of Night time Attended Measurements at Residential Receivers

Measurement Location	Date/Time	Criteria dB(A)	Noise Level (L _{A90}) dB(A)	Noise Level (L _{Aeq}) dB(A)	Exceedance (dBA)	Wind Speed (m/s)	Wind Direction (deg)
R2	10/05/16 22:05	50	53	54	4	9.7	247.5
R3	12/04/16 23:07	50	46	47	—	3.1	135
R4	12/04/16 23:28	50	39	40	—	1.9	135
R5	12/04/16 22:39	50	49	50	—	4.7	135
R6	12/04/16 22:26	50	41	42	—	4.7	135
R8	12/04/16 23:27	50	46	47	—	1.9	135
R9	12/04/16 23:59	50	38	40	—	1.7	112.5
R10	12/04/16 23:43	50	48	60	—	1.9	135
R11	13/04/16 00:00	50	42	47	—	1.7	112.5
R12	10/05/16 22:52	50	48	49	—	8.3	247.5
R13	12/04/16 23:44	50	41	42	—	1.9	135
R14	13/04/16 00:19	50	39	41	—	1.9	90
R15	12/04/16 23:12	50	50	54	4	3.1	135
R16	10/05/16 23:49	50	50	54	4	7.8	247.5
R17	12/04/16 22:42	50	40	44	—	4.7	135
R18	12/04/16 22:04	50	40	44	—	6.7	157.5

Night time measurements revealed exceedance of the relevant environmental noise criteria at locations R2, R15 and R16. Positions R10 was dominated by traffic noise along Victoria Road. For this position the L_{A90} was more than 10 dB less than the L_{Aeq} value indicating the measurement was most likely influenced by traffic noise. Although the measured noise levels at R2, R15 and R16 may have been affected by traffic noise it is likely that these affects were negligible due to the small variation between the L_{A90} and L_{Aeq}. For R2 and R15, local traffic noise was absent from the measurements however distant traffic noise may have contributed to the overall noise levels. For R16 measurements were conducted without traffic noise within the vicinity of the measurement location, however due to volume of traffic along Victoria Road, distant components of this traffic noise may have affected the overall noise levels. Contributions from constant distant traffic noise are expected to raise the background noise level.

The measured night time noise levels are generally congruent with those predicted using noise modelling software. The predicted L_{Aeq} noise levels at R2, R15 and R16 are 52, 52 and 51 dB respectively [4]. This is slightly less than the measured levels however still in exceedance of the night time noise criteria.



6.1.3 ADDITIONAL COMMENTS REGARDING THE ATTENDED MEASUREMENT SURVEY

Locations R2 and R15 were primarily impacted by industrial noise from ABC (plant noise). At location R16 the noise from the conveyor system within the reclaimer facility was the most audible component of industrial noise. Chain noise was inaudible at this location.

Inspection of the measurement spectra was also conducted. Analysis of the third octave band noise data showed that there were no tones present at the measured locations in the near vicinity of the plant during both the daytime and night-time measurements.

7 SUMMARY AND DISCUSSION

An attended measurement survey was conducted at 16 residential locations during both daytime and night-time periods. Exceedance of the relevant noise criteria was measured at locations R2, R15 and R16. Traffic noise was taken into account by considering the L_{A90} level in the case where traffic noise was considered to be a major influence.

We trust that the information provided is satisfactory. However, if you have any queries or require further information, please do not hesitate to contact us.

Yours sincerely,

Vipac Engineers & Scientists Ltd

Matthew Tripodi

Project Engineer

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