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Jandra Quarry Annual Noise Monitoring Assessment

2025

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Jandra Quarry Annual Noise Monitoring Assessment
2025

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Abbreviations and Definitions

	Description
ΔT	Vertical Temperature Difference, i.e. the measured difference in ambient temperature between two elevations on the same tower. It is defined as the upper-level temperature measurement minus the lower-level temperature measurement.
°	Degree
Ambient Noise	The all-encompassing noise within a given environment. It is the composite of sounds from many sources, both near and far.
Background noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is described using the LA90 descriptor (see below).
C	Celcius
CCAM	Conformal Cubic Atmospheric Model
CSIRO	Commonwealth Scientific and Industrial Research Organisation
dB	Abbreviation for decibel, a measure of sound equivalent to 20 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure, and 10 times the logarithm of a given sound power to a reference power.
dB(A)	A measure of A-weighted sound levels. A Weighting is an adjustment made to the sound level measurement to approximate the response of the human ear.
EPA	Environment Protection Authority
EPL	Environment Protection Licence
Extraneous noise	Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods. Normal daily traffic is not extraneous noise.
IEC	International Electrotechnical Commission
m	Metre
LA1	The noise level, measured in dB(A), which is exceeded for 1 per cent of the measurement period.
LA1(1min)	The noise level, measured in dB(A), which is exceeded for 1 per cent of the time over a 1-minute measurement period, i.e., is exceeded for 0.6 seconds. This measure can approximate to the maximum noise level but may be less if there is more than 1 noise event during this 0.6 second period.
LA10	The noise level, measured in dB(A), which is exceeded for 10 per cent of the time.
LA90	The noise level, measured in dB(A), which is exceeded for 90 per cent of the time, referred to as the background noise level. This is considered to represent the background noise (see above).
LAeq	The level of noise equivalent to the energy average of noise levels occurring over a defined measurement period.
LAeq (period)	The average equivalent noise level, measured in dB(A), during a measurement period (e.g., 15-minute, day, evening, or night).
LAmax	The A-weighted sound pressure level that represents the maximum noise level measured over the time that a given sound is measured.
NATA	National Association of Testing Authorities
NMA	Noise Monitoring Assessment
NMP	Noise Management Plan

	Description
NPfI	Noise Policy for Industry 2017
NSW	New South Wales
s	Second
SPL	The Sound Pressure Level. Sound pressure is the fluctuation in air pressure, from the steady atmospheric pressure, created by sound. The sound pressure level is the sound pressure expressed on a decibel scale.
TAPM	The Air Pollution Model

Source: Noise Guide for Local Government (NSW EPA, 2023)

1. Overview

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Jandra Quarry ("the quarry") at Possum Brush, NSW. This NMA is part of the annual monitoring requirement set out in the Development Consent and the NBMP for the monitoring period 1 May 2024 to 30 April 2025.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPfI) (NSW EPA, 2017);
- Environment Protection Licence (EPL) 2796 (NSW EPA, 2021);
- Jandra Quarry Noise and Blast Management Plan (NBMP) (Holcim Australia, 2018);
- Development Consent DA 213-10-99, Notice of Modification 2015 (Delegate of the Minister for Planning and Environment, 2015); and
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018).

1.1 Site Location and Sensitive Receptors

The quarry is located on the Pacific Highway at Possum Brush, approximately 17 km south of Taree, on the mid north coast of NSW. Receivers in the locality surrounding the quarry are primarily rural/residential. The Pacific Highway is situated to the west of the site, with highway traffic a dominant noise source at receivers within its proximity. To the east, the quarry is bounded by rural properties with road noise from The Lakes Way dominating the acoustic environment. The monitoring locations with respect to the quarry and assessed receivers are presented in **Figure 1**.

Imagery@ESRI World Imagery

RAMBOLL AUSTRALIA - GIS MAP file - 318000911_GIS_P006_NoiseMonitoring | F004 NoiseMonitoring_Jandra_V02 | 14/02/2025

Legend

- Noise monitoring location
- Residence (privately owned)
- Residence (Holcim owned)

Figure 1 : Noise monitoring locations at Jandra Quarry

2. Noise Criteria

The applicable noise criteria for this NMA according to the EPL, the NBMP and the Development Consent are shown in **Table 2-1** for both quarry operations only, and **Table** 2-2 for quarry operations and asphalt production combined. It is noted that asphalt campaigns at Jandra Quarry are sporadic, however when the asphalt plant does operate it can operate for 24 hours a day.

M8.1 of EPL 2796 requires:

"*to assess compliance with the noise limits of this licence, attend noise monitoring must be undertaken:*

a) during a period of normal quarry operations.
b) at each one of the noise monitoring locations listed in the noise limits table of this licence.
c) occur once annually in the reporting period.
d) *occur during the night period as defined in the NSW Industrial Noise Policy, and in conjunction with an asphalt campaign if any such campaign occurs within the quarterly monitoring period."*

Table 2-1: Quarry operations noise criteria

Location	EPA ID	Quarry Operations
		Shoulder[1], Day[2] and Evening[3]
		LAeq (15min)
		dB(A)
R4	14	36
R5	15	40
R6	16	36
R7	17	35

[1] 6 am–7 am Monday to Saturday
[2] 7 am–6 pm Monday to Saturday
[3] 6 pm–10 pm Monday to Saturday

Table 2-2: Quarry operations and asphalt plant production noise criteria

Location	EPA ID	Quarry Operations and Asphalt Plant Production		
		Shoulder[1], Day[2] and Evening[3]	Night[4]	
		LAeq (15min)	LAeq (15min)	LA1 (1min)
		dB(A)		
R4	14	40	39	51
R5	15	41	39	51
R6	16	40	35	48
R7	17	36	35	48

[1] 6 am–7 am Monday to Saturday
[2] 7 am–6 pm Monday to Saturday
[3] 6 pm–10 pm Monday to Saturday
[4] 10 pm–6 am Monday to Saturday

3. Methodology

The monitoring program was developed in accordance with the procedures described in *Australian Standard AS 1055:2018* (Standards Australia, 2018) and the Approval Documents referenced in **Section 1**. The measurements were completed using a RION Sound Level Meter NL-52 on Thursday 13 and Friday 14 February 2025. The acoustic instrumentation used carries current National Association of Testing Authorities (NATA) calibration and complies with *AS/NZS IEC 61672-1:2019 Class 1* (Standards Australia and Standards New Zealand, 2019). Calibration of all instrumentation was checked prior to and following measurements using a Pulsar Acoustic Calibrator 105 which also carried a current NATA calibration and complies with IEC 60942:2017 (IEC, 2017). Drift in calibration did not exceed ±0.3 dBA.

Attended noise monitoring was conducted for 15-minutes in duration during the morning shoulder and day periods over two days. The operator also observed and recorded the audible contributing noise sources for the duration of the 15-minute monitoring periods. Attended noise monitoring was not conducted during the evening period as the quarry was not operational. Attended noise monitoring was also not conducted during the night period as no asphalt campaigns were conducted by the quarry during this period. Where Jandra Quarry was not distinctly audible during the attended monitoring, the quarry contribution is estimated to be at least 10 dBA below the ambient noise level, as determined by the LA90.

3.1 Meteorological Conditions

Certain meteorological/weather conditions may increase noise levels by focusing sound-wave propagation paths at a single point. Such refraction of sound waves can occur during temperature inversions, where temperatures increase with height above ground level, as well as in the presence of a wind wind gradient (wind velocities increasing with height) with wind direction from the source to the receiver.

Condition L4.6 b) of the EPL states that Stability category shall be determined using the methods from Fact Sheet D of the NPfI (NSW EPA, 2017). To determine site relevant stability category, an onsite meterological station with data recorded at 10m height has been used to adopt wind direction, wind speed and rain data to inform this assessment. Wind direction, wind speed and temperature data has been adopted from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Conformal Cubic Atmospheric Model (CCAM) and modelled using The Air Pollution Model (TAPM) to determine the atmospheric category as outline in **Table 3-1.**

Table 3-1: Classification of Atmospheric Stability (NSW EPA, 2017)

Pasquill–Gifford stability category	Standard deviation of the horizontal wind direction fluctuations (σ_A in degrees [º])
A	$\sigma_A \geq 22.5°$
B	$17.5° \leq \sigma_A < 22.5°$
C	$12.5° \leq \sigma_A < 17.5°$
D	$7.5° \leq \sigma_A < 12.5°$
E	$3.8° \leq \sigma_A < 7.5°$
F	$2.1° \leq \sigma_A < 3.8°$
G	$\sigma_A \leq 2.1°$

The noise limits set out in **Table 2-1** and **Table 2-2** apply under the meteorological conditions specified in **Table 3-2**. For noise enhancing meteorological conditions not referred to in **Table 3-2**, the noise adjusted limits that apply are the noise limits in **Table 2-1** and **Table 2-2** plus 5 dB.

Table 3-2: Meteorological Conditions

Assessment Period	Meteorological Conditions
Day	Stability Categories A, B, C and D with wind speeds up to and including 3m/s at 10m above ground level.
Evening	Stability Categories A, B, C and D with wind speeds up to and including 3m/s at 10m above ground level.
Night	Stability Categories A, B, C and D with wind speeds up to and including 3m/s at 10m above ground level; or Stability category E and F with wind speeds up to and including 2m/s at 10m above ground level.

3.2 Modifying Factor Corrections

Condition L4.9 of the EPL states that, if appropriate, the modifying factor corrections in Table C1 on Fact Sheet C of the NPfI (NSW EPA, 2017) may be applied to the noise measurements by the noise monitoring equipment for the purpose of determing the noise generated from the premises.

4. Results and Discussion

4.1 Location EPA13

Noise monitoring at location EPA13 was not completed as access approval was not able to be obtained from the resident.

4.2 Location EPA14

Noise monitoring at location EPA14 was completed on Thursday 13 February 2025 with results presented in **Table 4-1**. Noise from the quarry was inaudible at EPA14 during the morning shoulder and day monitoring periods. The ambient noise environment was dominated by the Pacific Highway, insects and birds. The results meet the established noise criteria and indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-1: Noise survey results and observations for Location EPA14

Date	Start Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
13-02-25	6:28am to 6:43am (Morning Shoulder)	52.3	46.5	43.4	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 2 m/s Rain: nil Stability Category: A[1]	Background motorway/insects/birds 40-52 Quarry inaudible[2]	<33	36
13-02-25	7:00am to 7:15am (Day)	53.4	46.5	43.8	WD: n/a WS: 0 m/s Rain: Nil	WD: NW WS: 3 m/s Rain: nil Stability Category: A[1]	Background motorway/insects/birds 41-53 Quarry inaudible[2]	<34	36

[1] Data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[2] An assessment to determine Modifying Factor Corrections was therefore not required.

4.3 Location EPA15

Noise monitoring at location EPA15 was completed on Thursday 13 February 2025 with results presented in **Table 4-2**. Noise from the quarry was inaudible at EPA15 during the morning shoulder and day monitoring periods. The ambient noise environment was dominated by the Pacific Highway, insects and birds. The results meet the established noise criteria and indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-2: Noise survey results and observations for Location EPA15

Date	Start Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
13-02-25	6:01am to 6:16am (Morning Shoulder)	69.4	47.7	41.4	WD: n/a WS: 0 m/s Rain: Nil	WD:340° WS: 0.6 m/s Rain: nil Stability Category: A[1]	Background motorway/insects/birds 37-60 Birds 60-69 Quarry inaudible[2]	<31	40
13-02-25	7:18am to 7:33am (Day)	59.5	44.8	42.1	WD: n/a WS: 0 m/s Rain: Nil	WD: NW WS: 3.5 m/s Rain: nil Stability Category: A[1]	Background motorway/insects/birds 39-59 Quarry inaudible[2]	<32	40

[1] Data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[2] An assessment to determine Modifying Factor Corrections was therefore not required.

4.4 Location EPA16

Noise monitoring at location EPA16 was completed on Thursday 13 and Friday 14 February 2025 with results presented in **Table 4-3**. Noise from the quarry was inaudible at EPA16 during the morning shoulder and day monitoring periods. The ambient noise environment was dominated by the Pacific Highway, insects and birds. The results meet the established noise criteria and indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-3: Noise survey results and observations for Location EPA16

Date	Start Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
14-02-25	6:27am to 6:42am (Morning Shoulder)	69	44.8	41.3	WD: n/a WS: 0 m/s Rain: Nil	WD: SSW° WS: 2.5 m/s Rain: nil Stability Category: B[1]	Background motorway/insects/birds 40-61 Magpie 60-69 Quarry inaudible[2]	<31	36
13-02-25	7:54am to 8:09am (Day)	64.8	43.5	40.6	WD: n/a WS: 0 m/s Rain: Nil	WD: NW WS: 5 m/s Rain: nil Stability Category: A[1]	Background motorway/insects/birds 39-44 Birds 45-64 Quarry inaudible[2]	<31	36

[1] Data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[2] An assessment to determine Modifying Factor Corrections was therefore not required.

4.5 Location EPA17

Noise monitoring at location EPA17 was completed on Thursday 13 and Friday 14 February 2025 with results presented in **Table 4-4**. Noise from the quarry was inaudible at EPA17 during the morning shoulder and day monitoring periods. The ambient noise environment was dominated by the Pacific Highway, insects and birds. The results meet the established noise criteria and indicate that noise emissions from Jandra Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-4: Noise survey results and observations for Location EPA17

Date	Start Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and LAeq (dBA)	Jandra Quarry LAeq(15min) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
14-02-25	6:00m to 6:15am (Morning Shoulder)	66.8	57.4	37.6	WD: n/a WS: 0 m/s Rain: Nil	WD: SE° WS: 2 m/s Rain: nil Stability Category: B[1]	Background motorway/insects/cicadas 37-60 Birds 60-67 Rooster 45-50 Quarry inaudible[2]	<28	35
13-02-25	8:38am to 8:53am (Day)	65	40.2	36	WD: n/a WS: 0 m/s Rain: Nil	WD: NW WS: 4 m/s Rain: nil Stability Category: A[1]	Background motorway/insects/cicadas 34-50 Birds 47-65 Quarry inaudible[2]	<26	35

[1] Data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[2] An assessment to determine Modifying Factor Corrections was therefore not required.

5. Conclusion

This NMA was completed by Ramboll at the Holcim Jandra Quarry, Possum Brush, NSW as an annual requirement of the NBMP. Monitoring was carried out on Thursday 13 and Friday 14 February 2025 at four locations selected as representative to the sensitive receptors at the surroundings to Jandra Quarry.

No audible noise from quarry operations was observed at any of the four locations during the morning shoulder and day periods. The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Jandra Quarry, NSW.

6. References

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