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Cooma Road Quarry Quarterly Noise Monitoring Assessment

Quarter 1 2025

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Cooma Road Quarry Quarterly Noise Monitoring Assessment

Quarter 1 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.
DPHI	Department of Planning, Housing, and Infrastructure
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.
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

1.1 Project Driver

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for Cooma Road Quarry ("the quarry") at Googong, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPfI) (NSW EPA, 2017)
- Cooma Road Quarry Noise Management Plan (NMP) (Holcim Australia, 2019)
- Development Consent Application Number SSD_5109 (Minister for Planning and Infrastructure, 2013)
- Environment Protection Licence (EPL) number 1453 (NSW EPA, 2020)
- Australian Standard AS 1055:2018 Acoustics—Description and measurement of environmental noise (Standards Australia, 2018)
- Australian Standard AS/NZS IEC 61672.1:2019 Electroacoustics – Sound level meters, Part 1: Specifications (Standards Australia and Standards New Zealand, 2019)
- IEC 60942:2017 Electroacoustics - Electroacoustics – Sound calibrators (International Standard, 2017).

This NMA has been undertaken for the quarterly period January to March 2025, and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

1.2 Site Location and Sensitive Receivers

The quarry is in Googong, approximately 6 kilometres south of Queanbeyan, NSW. Sensitive receivers surrounding the quarry are primarily rural and residential properties in all directions. Old Cooma Road is located to the east of the quarry and passing road traffic is a dominate noise source for those receivers to the east of the quarry. Five monitoring locations have been selected for the NMA and in accordance with the Development Consent and are shown in **Table 1-1**.

Table 1-1: Monitoring locations locality and sensitive receivers

Monitoring Locations	Locality and Sensitive Receivers
N3	West of the quarry situated on a rural property off Copperfield Place. This location represents residential and rural receivers to the west of the quarry.
N8	Northeast of the quarry along Tempe Crescent and is representative of residential receivers in that area.
N38	On Heights Road and is representative of the elevated residential receivers to the east of the quarry.
N60	At 501 Old Cooma Road and represents the residence adjacent to the quarry access road.
N67	Situated on a rural property at 732 Old Cooma Road to the south of the quarry. This is representative of rural and residential receivers to the south, with direct line of site into the quarry pit

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**. The NMP states attended monitoring is to be undertaken within 30 metres of a private residence, where possible. During this NMA, monitoring at most locations (N3, N8, N60, and N67) was undertaken where safely accessible at each property boundary which was approximately 100 to 200 metres from each property dwelling.

Legend

- Noise monitoring location
- Property dwelling

Figure 1 : Noise monitoring locations at Cooma Road Quarry

2. Noise Criteria

Table 2-1 brings the applicable noise criteria outlined in the Development Consent for the residential receivers surrounding the quarry (N1–N71), and the five monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA (N3, N8, N38, N60, and N67).

Table 2-1: Monitoring locations and noise criteria

Receiver[1]	Monitoring Locations	Morning Shoulder[2]	Day[3]	Evening[4]
		LAeq (15min)	LAeq (15min)	LAeq (15min)
		dB(A)		
N1, N7, N8, N56, N57, N59, N63, N64, N65	N8	40	44	39
N67	N67	36	41	35
All other receivers between N9 and N71 inclusive	N60, N38	36	38	35
All other receivers	N3	35	35	35

[1] Refer to Appendix 5 of the Consolidated Development Consent – SSD 5109 (DOC19/541449) and/or the NMP for receiver locations on the map.

[2] 6 am–7 am

[3] 7 am–6 pm Monday to Saturday

[4] 6 pm–10 pm Monday to Saturday

Note: No operations on Sundays and public holidays

3. Methodology

The monitoring program was developed in accordance with the procedures described in Australian Standard AS 1055:2018 and the Approval Documents referenced in Section 1.

The operator-attended measurements were carried out using a RION Sound Level Meter NL-52 on Wednesday 8 January 2025 and Thursday 9 January 2025. The acoustic instrumentation implemented carries current National Association of Testing Authorities (NATA) calibration and complies with AS/NZS IEC 61672-1:2019 Class 1. Calibration of all instrumentation was checked prior to and following the measurements using a Pulsar Acoustic Calibrator 105 which also carried a current NATA calibration and complies with IEC 60942:2017. Drift in calibration did not exceed ±0.3 dBA.

The attended noise monitoring was conducted for 15-minutes in duration during the day, evening, and night periods over two days at each monitoring location. Where possible, throughout each measurement the operator(s) quantified the contribution of each significant noise source. Where the plant 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

Meterology has an important influence on noise monitoring assessment. Where an onsite meterological station with data recorded at 10m height has not been available, the nearest Department of Planning, Housing and Infrastructure (DPHI) meterological station has been used to adopt wind direction, wind speed and rain data to inform this assessment. 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, 2014)

Stability Classification	Pasquill Stability Category	Ambient temperature change with height (°C/100m)
Extremely unstable	A	$\Delta T \leq -1.9$
Moderately unstable	B	$-1.9 < \Delta T \leq -1.7$
Slightly unstable	C	$-1.7 < \Delta T \leq -1.5$
Neutral	D	$-1.5 < \Delta T \leq -0.5$
Slightly stable	E	$-0.5 < \Delta T \leq 1.5$
Moderately stable	F	$1.5 < \Delta T \leq 4.0$
Extremely stable	G	$\Delta T > 4.0$

As stated in the Development Consent, the noise criteria in Table 2-1 applies under all meteorological conditions except the following:

- During periods of rain or hail
- Average wind speed at microphone height exceeds 5 m/s
- Wind speeds greater than 3 m/s measured at 10 m above ground level
- Temperature inversion conditions greater than 3°C/100m.

Appendix 9 of the Development Consent also specifies that except for wind speed at microphone height, the data to be used for determing meterological conditons must be that recorded by the meterological station on or in the vicinity of the site.

4. Results and Discussion

4.1 Location N3

Noise monitoring at location N3 was conducted on Wednesday 8 January 2025 with results presented in **Table 4-1**. The quarry was inaudible at N3 during morning shoulder and day periods. The quarry was not operational during the evening period. Measured predominant ambient noise sources include background road traffic, birds, wind, trees, insects and aircraft. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance.

Table 4-1: Noise survey results and observations for Location N3

Date	Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
8-01-25	6:00am to 6:15am (Morning Shoulder)	59.1	35.7	26.1	WD: n/a WS: 0 m/s Rain: Nil	WD: 133° WS: 2.0 m/s Rain: nil Stability Category: E[2]	Background road traffic, birds 30-47 Quarry inaudible	<16	35
8-01-25	8:46am to 9:01am (Day)	55.3	37.8	33.7	WD: 120° WS: 2.3 m/s Rain: Nil	WD: 140° WS: 2.7 m/s Rain: nil Stability Category: E[2]	Background motorway traffic, wind 30-43 Birds 44-67 Quarry inaudible	<24	35
8-01-25	6:00pm to 6:15pm (Evening)	69.6	47.3	41.1	WD: 82° WS: 0.4 m/s Rain: Nil	WD: 91° WS: 3.2 m/s Rain: nil Stability Category: E[2]	Background road traffic, trees, insects, wind 42-58 Aircraft 55-69 Quarry not operational	n/a[3]	35

[1] Data sourced from Goulburn DPHI Met Station.

[2] Temperature data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[3] Quarry not operational.

4.2 Location N8

Noise monitoring at location N8 was conducted on Wednesday 8 January and Thursday 9 January 2025 with results presented in **Table 4-2**. The quarry was inaudible at N8 during the morning shoulder and day periods. The quarry was not operational during the evening period. Measured predominant ambient noise sources included road traffic, birds, passing cars on Tempe Crescent, trucks and motorcycles. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance.

Table 4-2: Noise survey results and observations for Location N8

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
9-01-25	6:21am to 6.36am (Morning Shoulder)	71.3	56.7	47.9	WD: n/a WS: 0 m/s Rain: Nil	WD: 133° WS: 2.0 m/s Rain: nil Stability Category: E[2]	Background road traffic, birds 45-60 Birds 61-71 Quarry inaudible	<38	40
8-01-25	7:42am to 7:57am (Day)	81.2	62.5	55	WD: n/a WS: 0 m/s Rain: Nil	WD: 136° WS: 2.4 m/s Rain: nil Stability Category: E[2]	Background road traffic 62-74 Trucks 72-81 Quarry inaudible	<45[3,4]	44
8-01-25	7:12pm to 7:29pm (Evening)	82.7	57.8	45.7	WD: n/a WS: 0 m/s Rain: Nil	WD: 91° WS: 3.1 m/s Rain: nil Stability Category: E[2]	Background road traffic, birds 37-74 Motorcycle 73-82 Car passing 68-72 Quarry not operational	n/a[5]	39

[1] Data sourced from Goulburn DPHI Met Station.

[2] Temperature data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[3] Measured LA90 value of 55 was dominated by road traffic, including trucks, so unable to estimate contribution for quarry at the assessment location.

[4] Negligible exceedance (NPfI 2017 – Table 4.1). The estimated 45 dBA was primarily due to the significant impact of extraneous noise sources on the monitoring.

[5] Quarry not operational.

4.3 Location N38

Noise monitoring at location N38 was conducted on Wednesday 8 January and Thursday 9 January 2025 with results presented in **Table 4-3**. The quarry was inaudible at N38 during morning shoulder and day periods. The quarry was not operational during the evening period. Measured predominant ambient noise sources include background road traffic, trucks, and aircrafts. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance.

Table 4-3: Noise survey results and observations for Location N38

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	Laeq	LA90					
9-01-25	6:39am to 6:54am (Morning Shoulder)	76.4	56.5	40.3	WD: n/a WS: 0 m/s Rain: Nil	WD: 133° WS: 2.0 m/s Rain: nil Stability Category: E[2]	Background road traffic 42-62 Trucks 62-76 Aircraft 54-68 Quarry inaudible	<30	36
8-01-25	8:02am to 8:17am (Day)	76.5	56.1	45.2	WD: n/a WS: 0 m/s Rain: Nil	WD: 140° WS: 2.7 m/s Rain: nil Stability Category: E[2]	Background road traffic 38-70 Trucks 72-76 Quarry inaudible	<35	38
8-01-25	7:31pm to 7:46pm (Evening)	68.1	50.5	41.8	WD: n/a WS: 0 m/s Rain: Nil	WD: 91° WS: 3.1 m/s Rain: nil Stability Category: E[2]	Background road traffic 43-68 Quarry not operational	n/a[3]	35

[1] Data sourced from Goulburn DPHI Met Station.

[2] Temperature data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[3] Quarry not operational.

4.4 Location N60

Noise monitoring at location N60 was conducted on Wednesday 8 January and Thursday 9 January 2025 with results presented in **Table 4-4**. The quarry was inaudible at N60 during morning shoulder and day periods. The quarry was not operational during the evening period. Measured predominant ambient noise sources included road traffic, birds, wind, trees, trucks and cars. These results are deemed to satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance (see Footnote 3 below).

Table 4-4: Noise survey results and observations for Location N60

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
9-01-25	6:00am to 6:15am (Morning Shoulder)	74.4	60.2	39.0	WD: n/a WS: 0 m/s Rain: Nil	WD: 133° WS: 2.0 m/s Rain: nil Stability Category: E[2]	Background road traffic 39-72 Birds 66-74 Quarry inaudible	<29	36
8-01-25	7:00am to 7:15am (Day)	73.2	63.9	53.9	WD: n/a WS: 0 m/s Rain: Nil	WD: 136° WS: 2.4 m/s Rain: nil Stability Category: E[2]	Background road traffic 40-62 Trucks 60-73 Quarry inaudible	<44[3]	38
8-01-25	6:49pm to 7:04pm (Evening)	76.6	60.9	46.0	WD: 267° WS: 2.3 m/s Rain: Nil	WD: 155° WS: 1.4 m/s Rain: nil Stability Category: E[2]	Background road traffic, wind, trees 40-65 Car passing 70-76 Quarry not operational	n/a[4]	35

[1] Data sourced from Goulburn DPHI Met Station.

[2] Temperature data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[3] Measured LA90 value of 53.9 was dominated by road traffic so unable to estimate contribution for quarry at the assessment location.

[4] Quarry not operational.

4.5 Location N67

Noise monitoring results at location N67 was conducted on Wednesday 8 January 2025 with results presented in **Table 4-5**. The quarry was inaudible at N67 during morning shoulder and day periods. The quarry was not operational during the evening period. Measured predominant ambient noise sources included road traffic, passing trucks, wind, trees, aircrafts and motorcycles. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance (see Footnotes 3 and 4 below).

Table 4-5: Noise survey results and observations for Location N67

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
8-01-25	6:30am to 6:45am (Morning Shoulder)	76.8	64.0	51.0	WD: n/a WS: 0 m/s Rain: Nil	WD: 133° WS: 2.0 m/s Rain: nil Stability Category: E[2]	Background road traffic 40-65 Trucks 60-72 Quarry inaudible	<41[3]	36
8-01-25	7:20am to 7:35am (Day)	94	65.2	54.4	WD: n/a WS: 0 m/s Rain: Nil	WD: 136° WS: 2.4 m/s Rain: nil Stability Category: E[2]	Background road traffic 60-72 Trucks, birds 70-76 Quarry inaudible	<44[4]	41
8-01-25	6:29pm to 6:44pm (Evening)	90	70.0	50.5	WD: n/a WS: 0 m/s Rain: Nil	WD: 91° WS: 3.2 m/s Rain: nil Stability Category: E[2]	Background road traffic, wind, trees 50-70 Aircraft 71-80 Motorcycle 65-99 Quarry not operational	n/a[5]	35

[1] Data sourced from Goulburn DPHI Met Station.

[2] Temperature data sourced from CSIRO CCAM and modelled using TAPM to determine Stability Category.

[3] Measured LA90 value of 51.0 was dominated by road traffic so unable to estimate contribution for quarry at the assessment location.

[4] Measured LA90 value of 54.4 was dominated by road traffic so unable to estimate contribution for quarry at the assessment location.

[5] Quarry not operational.

5. Conclusion

This NMA was completed by Ramboll at the Holcim Cooma Road Quarry, Googong, NSW as a quarterly requirement of the NMP. Monitoring was carried out on Wednesday, 8 January and Thursday, 9 January 2025 at five locations selected as representative to the sensitive receivers at the surroundings to Cooma Road Quarry.

No audible noise from quarry operations was observed at any of the five locations during the morning shoulder and day periods. The quarry was not operational during the evening periods.

The results presented in this NMA show compliance with the relevant noise criteria applicable to the operation of the Holcim Cooma Road Quarry, Googong, NSW.

It is noted that at three assessment locations, some exceedances of the noise criteria have been recorded as follows:

- Up to 1 dB at N8 during the day period;
- Up to 6 dB at N60 during the day period; and
- Up to 3 dB at N67 during the morning shoulder and day periods

However, it should be noted that the noise environment during these periods, noise monitoring was heavily affected by extraneous noise sources whilst the site was inaudible. Therefore, it can be concluded that the exceedances were not caused by the site operation.

6. References

Holcim Australia (2019) *Cooma Road Quarry, Noise Management Plan*.

International Electrotechnical Commission *IEC 60942:2017 Electroacoustics – Sound calibrators*

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