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# Cooma Road Quarry Quarterly Noise Monitoring Assessment

## Quarter 1 2024



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# Cooma Road Quarry Quarterly Noise Monitoring Assessment

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## Abbreviations and Definitions

<b>Ambient Noise</b>	The all-encompassing noise within a given environment. It is the composite of sounds from many sources, both near and far.
<b>Background noise</b>	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).
<b>dB</b>	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.
<b>dB(A)</b>	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.
<b>Extraneous noise</b>	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.
<b>LA1</b>	The noise level, measured in dB(A), which is exceeded for 1 per cent of the measurement period.
<b>LA1(1min)</b>	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.
<b>LA10</b>	The noise level, measured in dB(A), which is exceeded for 10 per cent of the time.
<b>LA90</b>	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).
<b>LAeq</b>	The level of noise equivalent to the energy average of noise levels occurring over a defined measurement period.
<b>LAeq (period)</b>	The average equivalent noise level, measured in dB(A), during a measurement period (e.g., 15-minute, day, evening, or night).
<b>LAm<sub>ax</sub></b>	The A-weighted sound pressure level that represents the maximum noise level measured over the time that a given sound is measured.
<b>NMA</b>	Noise Monitoring Assessment
<b>NMP</b>	Noise Management Plan
<b>SPL</b>	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.

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).
- IEC 60942 Ed. 3.0 b:2003 Electroacoustics - Sound calibrators (Standards Australia, 2003).

This NMA has been undertaken for the quarterly period January to March 2024, 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 as part of 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 will 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.





RAMBOLL AUSTRALIA - GIS MAP file : 318000911 GIS PO06 NoiseMonitoring | F003 NoiseMonitoring\_CoomaRd\_V03 | 29/01/2021  
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- 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 <sup>1</sup>	Monitoring Locations	Morning Shoulder <sup>2</sup>	Day <sup>3</sup>	Evening <sup>4</sup>
		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
<sup>1</sup> Refer to Appendix 5 of the Consolidated Development Consent – SSD 5109 (DOC19/541449) and/or the NMP for receiver locations on the map. <sup>2</sup> 6 am–7 am Monday to Saturday <sup>3</sup> 7 am–6 pm Monday to Saturday <sup>4</sup> 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 Monday 4 March 2024 and Tuesday 5 March 2024. The acoustic instrumentation implemented carries current NATA calibration and complies with AS/NZS IEC 61672-1:2013/2002 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 60942:2003. 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. 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

Meteorology has an important influence on noise monitoring assessment. Where an onsite meteorological station with data recorded at 10m height has not been available, the nearest Bureau of Meteorology data has been adopted to inform this assessment and modelled using The Air Pollution Model (TAPM) to determine the atmospheric stability 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 determining meteorological conditions must be that recorded by the meteorological station on or in the vicinity of the site.



## 4. Results and Discussion

### 4.1 Location N3

Noise monitoring at location N3 conducted on Monday 4 March 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources include background road traffic, birds, wind, rustling trees, and aircraft. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N3 are presented in **Table 4-1**.

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

Date	Time (hrs)	Descriptor (dBA)			Meteorology (Handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>					
04-03-24	6:30am to 6:45am (Morning Shoulder)	71.3	50.4	46.2	WD: 224° WS: 1.1 m/s Rain: Nil	WD: N WS: 3.6 m/s Rain: nil Stability Category: E <sup>1</sup>	Background wind/trees/ motorway hum 43-56 Aircraft 51-57 Birds 67 Quarry inaudible	<33 <sup>3</sup>	35
04-03-24	7:00am to 7:15am (Day)	65.5	54.0	49.7	WD: 224° WS: 1.5 m/s Rain: Nil	WD: N WS: 2.7 m/s Rain: nil Stability Category: D <sup>1</sup>	Background wind/trees/ motorway hum 47-60 Aircraft 51-50 Quarry inaudible	<40 <sup>4</sup>	35
04-03-24	6:03pm to 6:18pm (Evening)	78.3	50.6	42.8	WD: 151° WS: 0.7 m/s Rain: Nil	WD: N WS: 3.6 m/s Rain: nil Stability Category: D <sup>1</sup>	Background wind/trees/ motorway hum 39-50 Birds 46-71 Aircraft 43-59 Quarry not operational	n/a <sup>2</sup>	35

<sup>1</sup> Temperature data used from BOM (Station ID 94925) to undertake modelling using TAPM to determine Stability Category.

<sup>2</sup> Quarry not operational.

<sup>3</sup> LA90 value of less than 50 (estimated) was dominated by background noise so unable to estimate contribution for quarry at assessment location.

<sup>4</sup> Estimated based on observed background noise using LAeq.

#### 4.2 Location N8

Noise monitoring at location N8 on Monday 4 March 2024 and Tuesday 5 March 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic, passing cars on Tempe Crescent, birds, and nearby residences. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N8 are presented in **Table 4-2**.

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

Date	Time (hrs)	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
05-03-24	6:00am to 6:15am (Morning Shoulder)	62.4	44.6	33.9	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E <sup>1</sup>	Background road traffic 26-62 Cars on Tempe Cres. 60-62 Quarry inaudible	<24	40
04-03-24	7:27am to 7:42am (Day)	62.8	47.9	45.0	WD: 196° WS: 1.6 m/s Rain: Nil	WD: N WS: 3.1 m/s Rain: nil Stability Category: D <sup>1</sup>	Background road traffic 40-50 Birds 57-62 Quarry inaudible	<35	44
04-03-24	6:32pm to 6:46pm (Evening)	68.8	56.6	48.5	WD: 204° WS: 0.2 m/s Rain: Nil	WD: N WS: 3.1 m/s Rain: nil Stability Category: D <sup>1</sup>	Background motorway 39-56 Birds 45-62 Cars on Tempe Cres. 59-69 Nearby residences boxing 44-55 Quarry not operational	n/a <sup>12</sup>	39

<sup>1</sup> Temperature data used from BOM (Station ID 94925) to undertake modelling using TAPM to determine Stability Category.

<sup>2</sup> Quarry not operational.

### 4.3 Location N38

Noise monitoring at location N38 conducted on Monday 4 March 2024 and Tuesday 5 March 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic, passing cars on Heights Road, and birds. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N38 are presented in **Table 4-3**.

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

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90					
05-03-24	6:15am to 6:30am (Morning Shoulder)	60.6	40.3	30.1	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E <sup>1</sup>	Background motorway 22-60 Birds Quarry inaudible	<20	36
04-03-24	7:46am to 8:01am (Day)	69.8	53.5	46.9	WD: 192° WS: 1.0 m/s Rain: Nil	WD: N WS: 3.1 m/s Rain: nil Stability Category: D <sup>1</sup>	Background motorway 34-68 Quarry inaudible	<37	38
04-03-24	6:52pm to 7:07pm (Evening)	73.0	53.7	42.9	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 2.7 m/s Rain: nil Stability Category: D <sup>1</sup>	Background motorway/insects 38-73 Birds 44 Cars on Heights Rd. 59-70 Quarry not operational	n/a <sup>2</sup>	35

<sup>1</sup> Temperature data used from BOM (Station ID 94925) to undertake modelling using TAPM to determine Stability Category.

<sup>2</sup> Quarry not operational.

#### 4.4 Location N60

Noise monitoring at location N60 conducted on Monday 4 March 2024 and Tuesday 5 March 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic, and insects. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N60 are presented in **Table 4-4**.

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

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>					
05-03-24	6:45am to 7:00am (Morning Shoulder)	79.7	54.1	39.1	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E <sup>1</sup>	Background motorway 26-80 Quarry inaudible	<29	36
04-03-24	8:23am to 8:38am (Day)	64.1	50.3	41.8	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 2.7 m/s Rain: nil Stability Category: D <sup>1</sup>	Background motorway 32-64 Quarry inaudible	<32	38
04-03-24	7:32pm to 7:43pm (Evening)	75.4	60.0	50.9	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 2.2 m/s Rain: nil Stability Category: D <sup>1</sup>	Background motorway/insects 44-75 Quarry not operational	n/a <sup>2</sup>	35

<sup>1</sup> Temperature data used from BOM (Station ID 94925) to undertake modelling using TAPM to determine Stability Category.

<sup>2</sup> Quarry not operational.

#### 4.5 Location N67

Noise monitoring at location N67 conducted on Monday 4 March 2024 and Tuesday 5 March 2024 resulted in inaudible quarry noise during morning shoulder and day periods. The quarry was not operational during the evening period. Measured ambient noise sources included road traffic, wind, and insects. These results satisfy the established noise criteria and indicate that noise emissions from Cooma Road Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location N67 are presented in **Table 4-5**.

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

Date	Time	Descriptor (dBA)			Meteorology (handheld at microphone height)	Onsite Met Station (10m height)	Apparent Noise Source, Description and SPL (dBA)	Cooma Road Quarry LAeq(15min) (dBA) Contribution	LAeq(15min) Criteria (dBA)
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>					
05-03-24	6:30am to 6:45am (Morning Shoulder)	72.6	58.8	40.3	WD: n/a WS: 0 m/s Rain: Nil	WD: N WS: 0.4 m/s Rain: nil Stability Category: E <sup>1</sup>	Background motorway 27-73 Quarry inaudible	<30	36
04-03-24	8:05am to 8:20am (Day)	73.7	58.9	45.5	WD: 180° WS: 1.8 m/s Rain: Nil	WD: N WS: 3.1 m/s Rain: nil Stability Category: E <sup>1</sup>	Background motorway 37-73 Quarry inaudible	<36	41
04-03-24	7:13pm to 7:28pm (Evening)	84.1	65.1	46.7	WD: 150° WS: 0.6 m/s Rain: Nil	WD: N WS: 2.2 m/s Rain: nil Stability Category: E <sup>1</sup>	Background motorway/wind/insects 39-84 Quarry not operational	n/a <sup>2</sup>	35

<sup>1</sup> Temperature data used from BOM (Station ID 94925) to undertake modelling using TAPM to determine Stability Category.

<sup>2</sup> 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 Monday 4 March 2024 and Tuesday 5 March 2024 at five locations selected as representative to the sensitive receivers at the surroundings to Cooma Road Quarry. No exceedances of the noise criteria were recorded, and quarry noise was inaudible at the selected monitoring locations during the monitoring campaign. 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.



## 6. References

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