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# **QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 1 2023 LYNWOOD QUARRY, MARULAN, NSW**

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LYNWOOD QUARRY, MARULAN, NSW**

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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

Source: Noise Guide for Local Government (NSW EPA, 2013)

# 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 Lynwood Quarry (“the quarry”) at Marulan, NSW.

This NMA was done in accordance with the following documents:

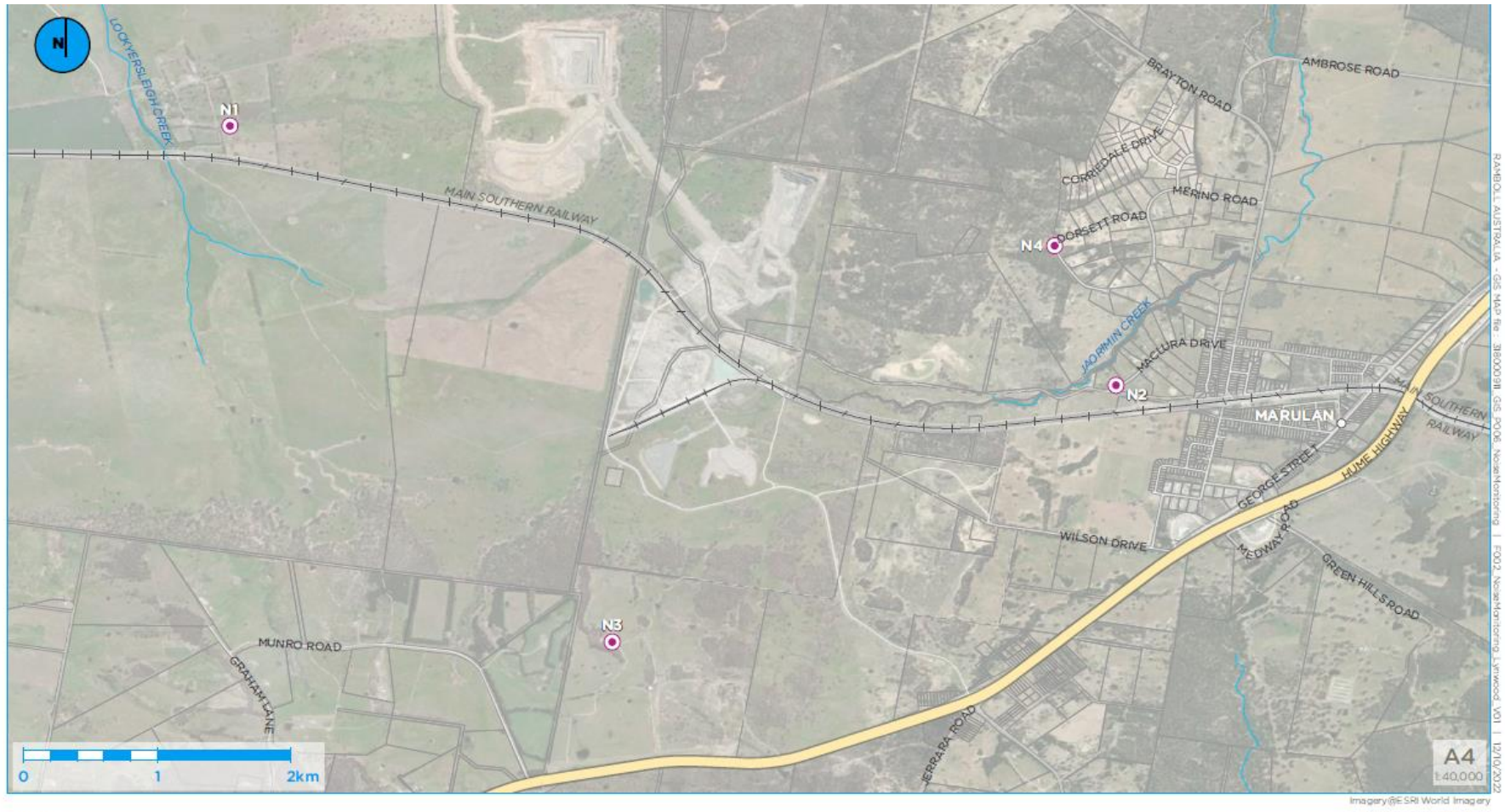
- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Lynwood Quarry Noise Management Plan (NMP) (Holcim Australia, 2019).
- Environment Protection Licence (EPL) number 12939 (NSW EPA, 2021).
- Development Consent DA 128-5-2005 (Minister for Planning, 2017).
- Australian Standard AS 1055:2018 Acoustics — 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 2023, and forms part of the monitoring program to determine compliance with conditions of the Development Consent.

## 1.2 Site Location and Sensitive Receptors

The quarry is located at 278 Stoney Creek Road, approximately 4 km to the west of the Marulan railway station and town centre. Sensitive receptors surrounding the quarry are primarily rural and residential (to the west of the site). The Hume Highway is located to the east and south of the quarry. Highway traffic (Hume Highway) is a dominant noise source.

The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan in **Figure 1**.



**Legend**  
● Noise monitoring location

Figure 1 : Noise monitoring locations at Lynwood Quarry

Confidential

## 2. NOISE CRITERIA

**Table 2-1** includes the applicable noise criteria outlined in the Development Consent and the EPL for the 16 residential receivers surrounding the quarry (L1–L16), and the four monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA (N1–N4). It should be noted that N3 was only accessible during the day and evening; night monitoring was completed at nearby location NM3 but on reflection the location within the quarry boundary to deemed unsuitable.

**Table 2-1: Monitoring locations and noise criteria**

EPL ID	Receiver Description	Monitoring Locations		Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>	Night <sup>3</sup>
		NMP ID	Address	LAeq (15min)	LAeq (15min)	LAeq (15min)	LA1 (1min)
				dBA			
L1	West of the Granite Pit.	N1	1114 Carrick Road, Marulan	35	35	35	45
L2	Northeast of the site	-	-	35	35	35	45
L3	Northeast of the site	-	-	35	35	35	45
L4	East of the site in Marulan	-	-	35	37	35	46
L5	East of the site in Marulan	-	-	35	35	35	46
L6	East of the site in Marulan	N2	End of Maclura Drive, Marulan	35	37	36	46
L7	East of the site in Marulan	-	-	38	38	35	55
L8	East of the site in Marulan	-	-	39	38	36	55
L9	East of the site in Marulan	-	-	39	39	37	56
L10	Southeast of the site in Old Marulan	-	-	42	42	40	53
L11	South of the site	N3	Northern Boundary, 16038 Hume Highway, Marulan	35	35	36	47
L12	East of the site in Marulan	N4	Corner of Dorsett and Suffolk Road, Marulan	37	37	36	47
L13	East of the site in Marulan	-	-	40	38	37	47
L14	South of the site	-	-	35	35	35	47
L15	South of the site	-	-	35	35	35	47
L16	Northeast of the site	-	-	35	35	35	45

<sup>1</sup> 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays  
<sup>2</sup> 6 pm–10 pm Monday to Sunday  
<sup>3</sup> 10 pm–7 am Monday to Saturday and 10 pm–8 am Sunday and public holidays

### 3. METHODOLOGY

The monitoring program was designed in accordance with the procedures described in Australian Standard AS 1055:2018 and the Approval Documents referenced in Section 1. The measurements were carried out using a RION Sound Level Meter NL-52 on Monday 6 February, Tuesday 7 February and Wednesday 8 February 2023. The acoustic instrumentation used 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 measurements using a Pulsar Acoustic Calibrator 105 which carried a current NATA calibration and complies with IEC 60942:2003. Drift in calibration did not exceed  $\pm 0.3$  dBA.

Attended noise monitoring was conducted for 15-minutes in duration during the day, evening, and night periods over three days. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source.



## 4. RESULTS AND DISCUSSION

### 4.1 Location N1

Noise monitoring at location N1 conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening, and night. The results and observations taken during the monitoring events at Location N1 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included birds, barking dogs, and wind.

**Table 4-1: Noise survey results and observations for Location N1**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAmx	LAeq	LA90						
06-02-23	16:38 (Day)	53.5	38.8	30.8	WD: 348° WS: 1.3 m/s Rain: Nil	Wind 39-43 Quarry inaudible	Inaudible	35	n/a	n/a
08-02-23	18:21 (Evening)	69.0	42.4	34.5	WD: 300° WS: 1.1 m/s Rain: Nil	Wind 40-50 Dogs barking 40-48 Birds 43-53 Quarry inaudible	Inaudible	35	n/a	n/a
07-02-23	6:20 (Night)	71.8	46.6	28.4	WD: 210° WS: 0.9 m/s Rain: Nil	Birds 30-66 Quarry inaudible	Inaudible	35	<45	45

## 4.2 Location N2

Noise monitoring at location N2 conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening, and night. The results and observations taken during the monitoring events at Location N2 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included wind, birds, frogs, excavators, and motorway traffic.

**Table 4-2 Noise survey results and observations for Location N2**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAmx	LAeq	LA90						
06-02-23	15:00 (Day)	59.6	46.6	39.4	WD: 120° WS: 1.6 m/s Rain: Nil	Wind 44-50 Excavator 44-50 Quarry inaudible	Inaudible	35	n/a	n/a
08-02-23	19:23 (Evening)	54.5	41.0	38.1	WD: 246° WS: 1.1 m/s Rain: Nil	Road 40-47 Birds 40-45 Frogs 44-45 Quarry inaudible	Inaudible	37	n/a	n/a
07-02-23	5:19 (Night)	70.4	43.5	39.6	WD: 250° WS: 0.9 m/s Rain: Nil	Road 42-50 Quarry inaudible	Inaudible	36	<46	46

### 4.3 Location N3

Noise monitoring at location N3 conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening, and night. The location was unable to be accessed during all periods due to a locked gate, so measurements were completed at an intermediate monitoring location approximately 900 m to the west on Munro Road, Marulan. The results and observations taken during the monitoring events at Location N3 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included frogs, motorway traffic, wind, and insects.

**Table 4-3: Noise survey results and observations for Location N3**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>						
06-02-23	13:17 (Day)	60.0	39.7	34.7	WD: 110° WS: 3.2 m/s Rain: Nil	Wind 39-46 Highway 32-37 Quarry inaudible	Inaudible	<35	n/a	n/a
08-02-23	19:47 (Evening)	66.4	48.3	43.0	WD: 272° WS: 1.0 m/s Rain: Nil	Highway 45-54 Passing car 50-64 Wind 43-50 Quarry inaudible	Inaudible	<35	n/a	n/a
07-02-23	4:47 (Night)	59.6	42.9	35.8	WD: - WS: 1.2 m/s Rain: Nil	Frogs 35-38 Road 40-49 Insects 33-36 Quarry inaudible	Inaudible	<36	<47	47

#### 4.4 Location N4

Noise monitoring at location N4 was conducted on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 resulted in inaudible noise during the day, evening and night, The results and observations taken during the monitoring events at location N2 are presented in **Table 4-1**. The results meet the established noise criteria and indicate that noise emissions from Lynwood Quarry did not contribute to noise nuisance at the time of the monitoring.

Noise sources measured included birds, insects, passing cars, and wind.

**Table 4-4: Noise survey results and observations for Location N4**

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Lynwood Quarry Contribution (LA1sec) (dBA)	LAeq(15min) Criteria (dBA)	Lynwood Quarry LA1(1min) Contribution (dBA)	LA1(1min) Criteria (dBA)
		LAmx	LAeq	LA90						
06-02-23	15:37 (Day)	57.1	39.1	32.0	WD: 100° WS: 1.7 m/s Rain: Nil	Passing car 40-42 Insects 35-38 Quarry inaudible	Inaudible	37	n/a	n/a
08-02-23	19:00 (Evening)	62.0	41.7	37.4	WD: 280° WS: 1.5 m/s Rain: Nil	Birds 40-50 Wind 40-45 Quarry inaudible	Inaudible	37	n/a	n/a
07-02-23	5:42 (Night)	57.7	39.9	34.4	WD: 212° WS: 0.8 m/s Rain: Nil	Road 33-40 Birds 42-57 Quarry inaudible	Inaudible	36	<47	47

## 5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Lynwood Quarry, Marulan, NSW as a quarterly requirement of the NMP. Monitoring was carried out on Monday 6 February 2023, Tuesday 7 February 2023 and Wednesday 8 February 2023 at four locations selected as representative to the sensitive receptors at the surroundings to Lynwood Quarry. No audible noise from quarry operations was recorded at any of the four locations during the day, evening, and night periods.

## 6. REFERENCES

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