Intended for
Holcim (Australia) Pty Ltd

Document type
Report

Date
February 2026

Dubbo Quarry Annual Noise Monitoring Assessment
2025

RAMBOLL Bright ideas. Sustainable change.

Dubbo Quarry Annual Noise Monitoring Assessment
2025

Project name	**NSW Environmental Monitoring 2024-2025**
Project no.	**318001800**
Recipient	**Leeroy Wall**
Document type	**Report**
Version	**1**
Date	**19/02/2026**
Prepared by	**Brodie Wood**
Checked by	**Arnold Cho, Jake Bourke**
Approved by	**Gavan Butterfield**
Description	**Data collected on 21 and 22 October 2025 for the annual noise monitoring program at Dubbo Quarry, Dubbo, NSW**

Ramboll
The Arc, 45a Watt St
Newcastle, NSW 2300
Australia

T +61 2 4962 5444
https://www.ramboll.com/

Ramboll Australia Pty Ltd.
ACN 095 437 442
ABN 49 095 437 442

Contents

Table of Tables

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
AGL	Above ground level
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.
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 Dubbo Quarry ("the quarry") at Dubbo, NSW.

This NMA was done in accordance with the following documents:

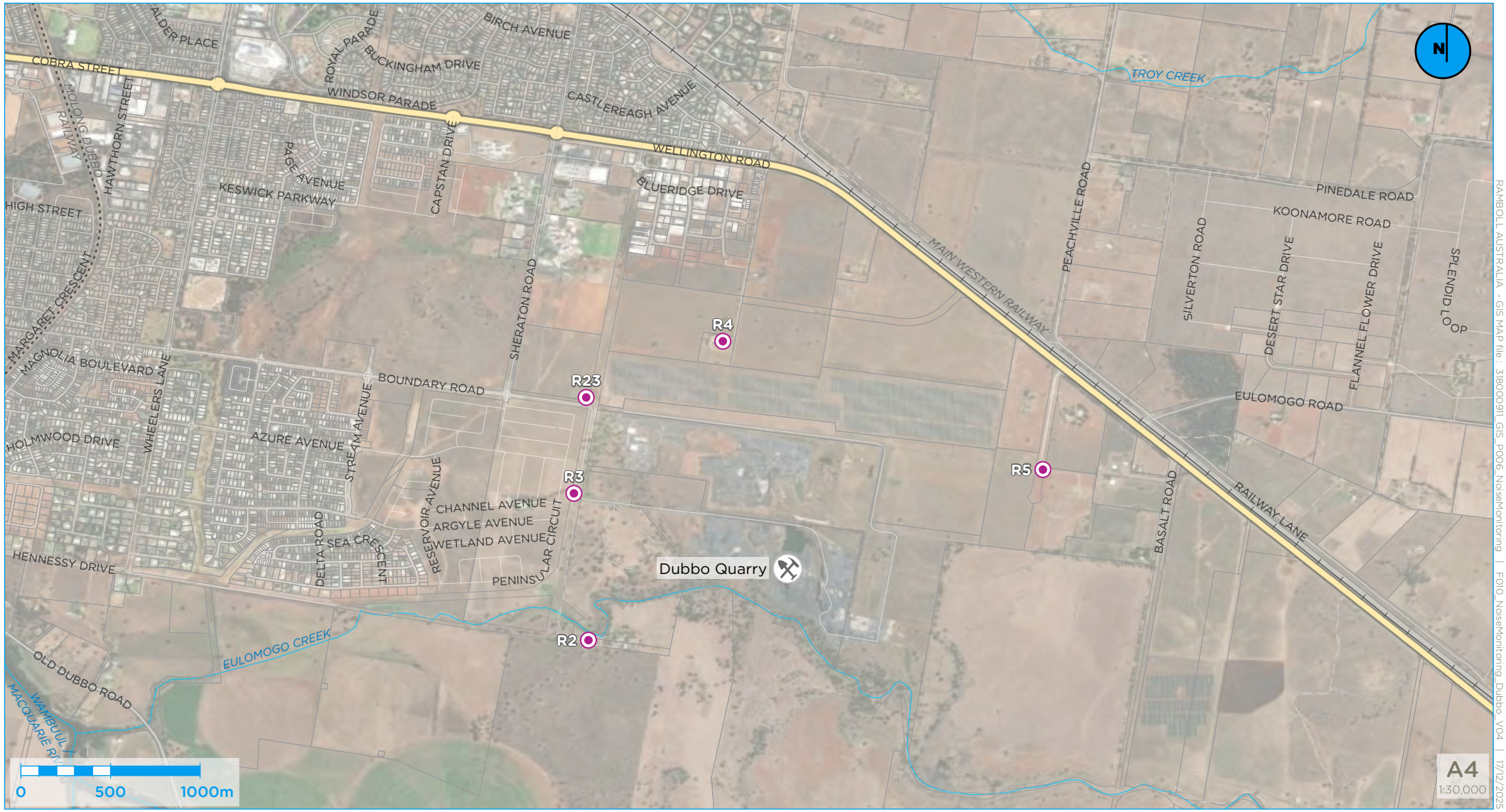
- Noise Policy for Industry (NPfI) (NSW EPA, 2017).
- Dubbo Quarry Noise Management Plan (NMP) (EMM Consulting Pty Ltd, 2023).
- Development Consent SSD 10417 'Dubbo Quarry Continuation Project' (Minister for Planning, 2023).
- Australian Standard AS 1055:2018 Acoustics — Description and measurement 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 2025, and forms part of the annual monitoring program to determine compliance with Operational Noise Criteria stipulated in the Development Consent.

1.2 Site Location and Sensitive Receptors

The quarry is located within the Dubbo Regional Local Government Area (LGA) and is located approximately 1.9 km to the east of the city of Dubbo, NSW. The quarry is accessed via Sheraton Road which connects to the Mitchell Highway approximately 2 km north-west of the quarry. Noise sensitive receivers surrounding the quarry are primarily rural and residential (to the north, east and west of the site). The MAAS Quarry is located directly adjacent to Holcim to the north and is a dominant noise source for some of those receiver locations.

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 Dubbo Quarry

2. Noise Criteria

Table 2-1 includes the applicable noise criteria outlined in the Development Consent for the 6 residential receivers surrounding the quarry (R1-R5 and R23). The four monitoring locations adopted from the NMP that are deemed representative and applicable for this NMA are R2, R3, R4 and R5. It should be noted that R1 is not monitored as Holcim currently has a negotiated agreement in place with the landowner of this residential property, and R23 is not monitored as no residence currently exists at this location (i.e. vacant land).

Table 2-1: Monitoring locations and noise criteria

Residential assessment location	Easting	Northing	Day[1]		Night[2]	
			Stripping activities	All other quarrying operations		
			LAeq (15min)	LAeq (15min)	LAeq (15min)	LAmax
			dBA			
R1[3]	655384	6427170	49	49	40	52
R2	655320	6426775	46	44	35	52
R3	654875	6427538	43	43	37	52
R4	655838	6428439	41	41	35	52
R5	657491	6427569	40	41	35	52
R23[4]	655196	6428133	42	42	37	52
All other non-project related privately owned residences	-	-	40	40	35	52

[1] 7 am–6 pm Monday to Saturday.

[2] 10 pm–7 am Monday to Saturday.

[3] Holcim currently has a negotiated agreement in place with the landowner of this residential property.

[4] No residence currently exists at this location (i.e., vacant land).

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 measurements were carried out using a RION Sound Level Meter NL-52 on Tuesday, 21 October and Wednesday, 22 October 2025. The acoustic instrumentation 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 complies with IEC 60942:2003. Drift in calibration did not exceed ±0.3 dBA.

Each attended noise measurement was conducted for 15-minutes in duration during the day and night periods over two days. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source. Where the 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 Meteorology

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	$\Delta T > 4.0$

Condition B2 of the consent states that noise generated by the development must be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW NPfI (EPA, 2017). Fact Sheet D of the NPfI describes 'standard' and 'noise-enhancing' meteorological conditions under which the noise limits apply. These conditions are defined in **Table 3-2**.

Table 3-2: NPfI Meteorological conditions (EPA, 2017)

Meteorological condition	Definition
Standard	Defined by stability categories A through to D, with wind speeds up to 0.5 m/s at 10 m above ground level (AGL) for day, evening and night periods.
Noise-enhancing	Defined by stability categories A through to D, with light winds (up to 3 m/s at 10 m AGL) for the day and evening periods; and stability categories A through to D, with light winds (up to 3 m/s at 10 m AGL) and/or stability category F with winds up to 2 m/s at 10 m AGL.

Further, Section 5.2 of the NPfI states that noise limits applicable under very noise-enhancing conditions should be the limits that apply under standard or noise-enhancing conditions plus 5 dB. This implies that there will be no periods when noise limits do not apply due to meteorological conditions.

As per the consent, and in accordance with the NPfI, a +5 dB adjustment to the operational limits shown in **Table 2-1** is adopted when attended noise monitoring is undertaken during 'very noise-enhancing' conditions.

The NPfI defines very noise-enhancing conditions as conditions outside of the range of either standard or noise-enhancing meteorological conditions as outlined in **Table 3-2**. When monitoring has been undertaken during very noise-enhancing conditions, a +5 dB adjustment to the operational limits in **Table 2-1** have been adopted.

4. Results and Discussion

4.1 Location R2

Noise monitoring at location R2 was conducted on Tuesday 21 October 2025 and Wednesday 22 October 2025 with results presented in **Table 4-1**. Noise from the quarry was inaudible during the day and night period. The ambient noise environment was dominated by trees, wind, birds, insects and a passing truck. The results meet the established noise criteria and indicate that noise emissions from Dubbo Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-1: Noise survey results and observations for Location R2

Date	Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Dubbo Quarry LAeq(15min) Contribution (dBA)	LAeq (15min) Criteria (dBA)	Dubbo Quarry LAmax Contribution (dBA)	LAmax Criteria (dBA)
		LAmax	LAeq	LA90							
21-10-25	3:07pm to 3:22pm (Day)	58.1	45.4	40.8	WD: 330° WS: 3 m/s Rain: Nil	WD: 339° WS: 1.8 m/s Rain: nil Stability Category: E[2]	Trees, wind, birds, insects 40-49 Bird 50-58 Truck passing 45 Quarry inaudible	<31	44	n/a	n/a
22-10-25	5:53am to 6:08am (Night)	63.1	47.6	44	WD: 330° WS: 3 m/s Rain: Nil	WD: 351° WS: 3.5 m/s Rain: nil Stability Category: E[2]	Wind, trees, birds, insects 46-54 Quarry inaudible	<34	35	n/a[3]	52

[1] Data sourced from Orange DPHI Met Station.

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

[3] Measured LAmax of 63.1 dBA was dominated by wind, trees birds and insects so unable to estimate contribution for quarry at assessment location.

4.2 Location R3

Noise monitoring at location R3 was conducted on Tuesday 21 October 2025 and Wednesday 22 October 2025 with results presented in **Table 4-2**. Noise from the quarry was inaudible during the day period. The quarry was not operational during the night period. The ambient noise environment was dominated by trees, wind, birds, insects and passing trucks and cars. The results meet the established noise criteria and indicate that noise emissions from Dubbo Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-2 Noise survey results and observations for Location R3

Date	Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Dubbo Quarry LAeq(15min) Contribution (dBA)	LAeq (15min) Criteria (dBA)	Dubbo Quarry LAmax Contribution (dBA)	LAmax Criteria (dBA)
		LAmax	LAeq	LA90							
21-10-25	3:27pm to 3:42pm (Day)	59.7	43.2	38.6	WD: 330° WS: 3 m/s Rain: Nil	WD: 339° WS: 1.8 m/s Rain: nil Stability Category: E[2]	Trees, wind, birds, insects 40-47 Car passing 45 Truck passing 50-59 Quarry inaudible	<29	43	n/a	n/a
22-10-25	5:32am to 5:47am (Night)	66.3	50.3	42.3	WD: 300° WS: 3 m/s Rain: Nil	WD: 351° WS: 3.5 m/s Rain: nil Stability Category: E[2]	Wind, trees, insects, birds 44-60 Quarry not operational	n/a[3]	37	n/a[3]	52

[1] Data sourced from Orange DPHI Met Station.

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

[3] Quarry not operational.

4.3 Location R4

Noise monitoring at location R4 was conducted on Tuesday 21 October 2025 and Wednesday 22 October 2025 with results presented in **Table 4-3**. Noise from the quarry was audible during the day period. The quarry was not operational during the night period. The ambient noise environment was dominated by background traffic, wind, trees, insects, birds and aircraft. The results meet the established noise criteria and indicate that noise emissions from Dubbo Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-3: Noise survey results and observations for Location R4

Date	Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Dubbo Quarry LAeq(15min) Contribution (dBA)	LAeq (15min) Criteria (dBA)	Dubbo Quarry LAmax Contribution (dBA)	LAmax Criteria (dBA)
		LAmax	LAeq	LA90							
21-10-25	4:01pm to 4:16pm (Day)	53.7	40.4	37.2	WD: 300° WS: 0.6 m/s Rain: Nil	WD: 314° WS: 1.8 m/s Rain: nil Stability Category: E[2]	Background traffic, wind, trees, insects, birds 39-43 Aircraft 40-52 Quarry inaudible	<27	41	n/a	n/a
22-10-25	5:07am to 5:22am (Night)	58.3	41.4	36.9	WD: 330° WS: 2.8 m/s Rain: Nil	WD: 351° WS: 3.5 m/s Rain: nil Stability Category: E[2]	Background traffic, wind, trees, insects 40-54 Quarry not operational	n/a[3]	35	n/a[3]	52

[1] Data sourced from Orange 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 R5

Noise monitoring at location R5 was conducted on Tuesday 21 October 2025 and Wednesday 22 October 2025 with results presented in **Table 4-4**. Noise from the quarry was inaudible during the day period. The quarry was not operational during the night period. The ambient noise environment was dominated by background traffic, wind, trees, birds passing car and aircraft. The results meet the established noise criteria and indicate that noise emissions from Dubbo Quarry did not contribute to noise nuisance at the time of the monitoring.

Table 4-4: Noise survey results and observations for Location R5

Date	Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Dubbo Quarry LAeq(15min) Contribution (dBA)	LAeq (15min) Criteria (dBA)	Dubbo Quarry LAmax Contribution (dBA)	LAmax Criteria (dBA)
		LAmax	LAeq	LA90							
21-10-25	4:32pm to 4:57pm (Day)	72.9	46.5	42.1	WD: 300° WS: 0.6 m/s Rain: Nil	WD: 314° WS: 1.8 m/s Rain: nil Stability Category: E[2]	Background traffic, wind, trees, birds 40-52 Car passing 60-72 Quarry inaudible	<32	41	n/a	n/a
22-10-25	4:44am to 4:59am (Night)	64.1	48.1	39.5	WD: 330° WS: 2.8 m/s Rain: Nil	WD: 346° WS: 2.8 m/s Rain: nil Stability Category: E[2]	Background traffic, wind, trees, insects 40-54 Aircraft 60-62 Quarry not operational	n/a[3]	35	n/a[3]	52

[1] Data sourced from Orange DPHI Met Station.

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

[3] Quarry not operational.

4.5 Location R23

Noise monitoring at location R23 was conducted on Tuesday 21 October 2025 and Wednesday 22 October 2025 with results presented in **Table 4-5**. Noise from the quarry was inaudible during the day and night period. The ambient noise environment was dominated wind, trees, birds, insects and passing trucks. It is noted that location R23 currently represents a vacant block, and the established noise criteria do not yet apply to this location. However, noise monitoring was conducted for the purpose of checking compliance for future residential use. The results meet the established noise criteria and indicate that noise emissions from Dubbo Quarry would not have contributed to noise nuisance at the time of the monitoring.

Table 4-5 Noise survey results and observations for Location R23

Date	Time	Descriptor (dBA)			Meteorology (Handheld at microphone height)	DPHI Met Station (at 10m)[1]	Apparent Noise Source, Description and SPL (dBA)	Dubbo Quarry LAeq(15min) Contribution (dBA)	LAeq (15min) Criteria (dBA)	Dubbo Quarry LAmax Contribution (dBA)	LAmax Criteria (dBA)
		LAmax	LAeq	LA90							
21-10-25	2:45pm to 3:00pm (Day)	58	45.4	40.2	WD: 300° WS: 3 m/s Rain: Nil	WD: 313° WS: 1.7 m/s Rain: nil Stability Category: E[2]	Wind, trees, birds, insects 41-45 Trucks 45-50 Bird 50-57 Quarry inaudible	<30	42	n/a	n/a
22-10-25	6:00am to 6:13am (Night)	76	49.7	44.6	WD: 330° WS: 3 m/s Rain: Nil	WD: 352° WS: 3.3 m/s Rain: nil Stability Category: E[2]	Wind, trees, birds, insects 45-54 Quarry inaudible	<35	37	n/a[3]	52

[1] Data sourced from Orange DPHI Met Station.

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

[3] Measured LAmax of 76 dBA was dominated by wind, trees, birds and insects so unable to estimate contribution for quarry at assessment location.

5. Conclusion

This NMA was completed by Ramboll for the Holcim Dubbo Quarry, Dubbo, NSW as an annual requirement of the NMP. Monitoring was carried out on Tuesday 21 October 2025 and Wednesday 22 October 2025 at five locations selected as representative to the sensitive receptors at the surroundings to Dubbo Quarry, Dubbo NSW.

The quarry was inaudible at all five monitoring locations. The results presented in this NMA show compliance with the relevant noise criteria applicable to operations of the Holcim Dubbo Quarry.

6. Limitations

Ramboll Australia Pty Ltd prepared this report in accordance with the scope of work as outlined in our proposal to Holcim (Australia) Pty Ltd and in accordance with our understanding and interpretation of current regulatory standards.

Site conditions may change over time. This report is based on conditions encountered at the Site at the time of the report and Ramboll disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent Ramboll's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment.

Ramboll did not independently verify all of the written or oral information provided to Ramboll during the course of this investigation. While Ramboll has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

6.1 User Reliance

This report has been prepared exclusively for Holcim (Australia) Pty Ltd and may not be relied upon by any other person or entity without Ramboll's express written permission.

7. References

EMM Consulting Pty Ltd. (2023). *Noise Management Plan, Dubbo Quarry, Holcim (Australia) Pty Ltd.*

Minister for Planning. (2023). *Development Consent SSD 10417, 'Dubbo Quarry Continuation Project'.*

NSW EPA. (2014). *Discussion Paper. Validation of Inversion Strength Estimation Method.*

NSW EPA. (2017). *Noise Policy for Industry (NPfI). Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf (Accessed: 1 November 2024).*

NSW EPA. (2023). *Noise Guide for Local Government. Available at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20130127nglg.pdf.*

Standards Australia. (2003). *AS 60942:2003 Electroacoustics - Sound calibrators. Australian Standard.*

Standards Australia. (2018). *AS 1055:2018 Acoustics—Description and measurement of environmental noise. Australian Standard. Available at: https://infostore.saiglobal.com/preview/825367946534.pdf?sku=1131503_SAIG_AS_AS_2626154 (Accessed: 1 October 2024).*