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QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 4 2022

TEVEN QUARRY, TEVEN, NSW

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QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 4 2022
TEVEN QUARRY, TEVEN, NSW

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ABBREVIATIONS AND DEFINITIONS

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).
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.
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.
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.
NMA	Noise Monitoring Assessment
NMP	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 Teven Quarry ("the quarry") at Teven, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Teven Quarry Noise Management Plan (NMP) (Holcim Australia, 2021).
- Environment Protection Licence (EPL) number 3293 (NSW EPA, 2021).
- Development Consent Application Number SSD_6422 (Minister for Planning and Environment, 2015).
- 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 in accordance with the NMP for the quarterly period October to December 2022, 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 in Teven, NSW, approximately 7 km west of Ballina, NSW.

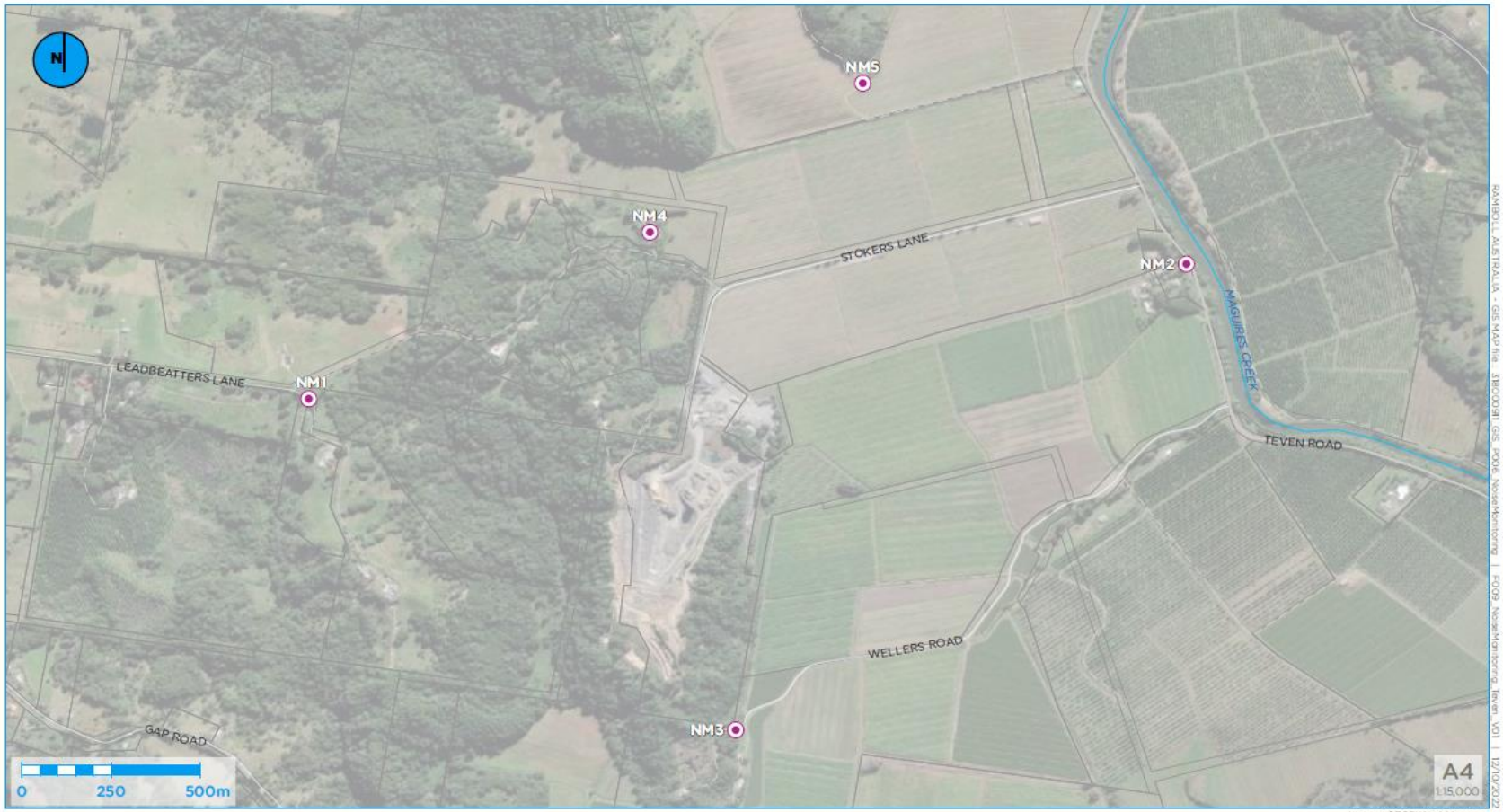
Sensitive receptors surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography.

Five monitoring locations have been selected as part of the NMA and in accordance with the EPL and Development Consent and are shown in **Table 1-1**.

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Nearest Receiver	Locality and Sensitive Receptors
NM1	R7	West of the quarry situated at a rural residential property at the end of Leadbeatters Lane.
NM2	R3/R4	East of the quarry situated at a rural residential property on Teven Road.
NM3	R2	South of the quarry situated at a rural residential property at the end of Wellers Road.
NM4	R10	North of the quarry situated at a rural residential property adjacent the site off Stokers Lane.
NM5	R14	Northeast of the quarry situated at a rural residential property of Teven Road.

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



Legend

Noise monitoring location

Figure 1 : Noise monitoring locations at Teven Quarry

2. NOISE CRITERIA

Table 2-1 summaries the applicable noise criteria outlined in the NMP and Development Consent for residential receivers (NM1, NM2, NM3, NM4, NM5) surrounding the quarry.

Table 2-1: Monitoring locations and noise criteria

Receivers	Monitoring Locations	Day[1]	Evening[2]
		LAeq (15min)	LAeq (15min)
		Db(A)	
R3, R4, R13, R15, R16, R17, R18, R20	NM2	38	35
All other receivers	NM1, NM3, NM4, NM5	37	35

[1] 7 am–6 pm Monday to Saturday and 8 am–6 pm Sunday and public holidays

[2] 6 pm–10 pm Monday to Sunday

3. METHODOLOGY

The monitoring program was created 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 13 December 2022 and Wednesday 14 December 2022. 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 also carried a current NATA calibration and complies with IEC 60942:2003. Drift in calibration did not exceed ±0.3 dBA.

Attended noise monitoring was conducted for 15-minute periods at each location over two days. As per the NMP, two measurements were conducted during the day, and two measurements were conducted during the evening, at each monitoring location. It is noted that the quarry was not operational during the evening periods, however, monitoring was conducted as per requirements of the EPL.

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, or estimated to be less than criteria value.

4. RESULTS AND DISCUSSION

4.1 Location NM1

Noise monitoring at location NM1 conducted on Tuesday 13 December 2022 and Wednesday 14 December 2022 resulted in inaudible quarry noise during both the day and evening periods. These results meet the established noise criteria and indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring event at Location NM1 are presented in Table 4-1.

Extraneous noise sources and the dominant background contribution was from birds and insects.

Table 4-1: Noise survey results and observations for Location NM1

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
14-12-22	7:00 (Day)	82	46	32	WD: n/a WS: 0 Rain: Nil	Background 35 Birds 40 Quarry inaudible	<37	37
14-12-22	7:15 (Day)	60	35	30	WD: n/a WS: 0 Rain: Nil	Background 35 Birds 40 Quarry inaudible	<37	37
13-12-22	20:53 (Evening)	61	42	40	WD: n/a WS: 0 Rain: Nil	Insects 40-48 Distant Road traffic 40 Aircraft 45 Quarry inaudible	<35	35
13-12-22	21:09 (Evening)	58	40	39	WD: n/a WS: 0 Rain: Nil	Insects 40-45 Distant Road traffic 40 Aircraft 58 Quarry inaudible	<35	35

4.2 Location NM2

Noise monitoring at location NM2 conducted on Tuesday 13 December 2022 and Wednesday 14 December 2022 resulted in inaudible quarry noise during both the day and evening periods. These results meet the established noise criteria and indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM2 are presented in Table 4-2.

Extraneous noise sources measured included birds, aircraft, a barking dog, and cars and trucks passing on Teven Road.

Table 4-2: Noise survey results and observations for Location NM2

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
14-12-22	8:53 (Day)	88	66	45	WD: n/a WS: 0 Rain: Nil	Birds Car passing 73 Truck passing 80 Quarry inaudible	<38	38
14-12-22	9:09 (Day)	85	66	41	WD: n/a WS: 0 Rain: Nil	Birds Trucks passing 61-79 Dog barking Quarry inaudible	<38	38
13-12-22	18:57 (Evening)	81	59	35	WD: 270° WS: 0.4 m/s Rain: Nil	Birds 50-63 Cars passing 55-80 Aircraft 57 Dog barking 55-57 Quarry inaudible	<35	35
13-12-22	19:12 (Evening)	83	57	35	WD: 270° WS: 0.3 m/s Rain: Nil	Birds 48-59 Cars passing 52-80 Quarry inaudible	<35	35

4.3 Location NM3

Noise monitoring at location NM3 conducted on Tuesday 13 December 2022 and Wednesday 14 December 2022 resulted in inaudible quarry noise during both the day and evening periods. These results meet the established noise criteria and indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM3 are presented in Table 4-3.

Noise sources measured included birds, aircrafts, distant road traffic and chirping insects (mostly cicada). Insects were the dominant noise source.

Table 4-3: Noise survey results and observations for Location NM3

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
14-12-22	9:29 (Day)	73	58	56	WD: n/a WS: 0 Rain: Nil	Aircraft 60 Birds Insects (dominant source) Quarry inaudible	<37	37
14-12-22	9:45 (Day)	82	58	56	WD: n/a WS: 0 Rain: Nil	Birds Insects 54-59 Quarry inaudible	<37	37
13-12-22	18:07 (Evening)	67	41	37	WD: 270° WS: 0.6 m/s Rain: Nil	Bird 47 Insects chirping 37-39 Cicada 43-45 Distant Road traffic 38-47 Quarry inaudible	<35	35
13-12-22	18:38 (Evening)	59	40	37	WD: 270° WS: 1.6 m/s Rain: Nil	Aircraft 59 Bird calls 37-52 Insects chirping 37-39 Distant Road traffic 38-43 Quarry inaudible	<35	35

4.4 Location NM4

Noise monitoring at location NM4 conducted on Tuesday 13 December 2022 and Wednesday 14 December 2022 resulted in inaudible quarry noise during both the day and evening periods. These results meet the established noise criteria and indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM4 are presented in Table 4-4.

Noise sources measured included birds, traffic to site, reverse beeper, front end loader, aircraft, passing trucks, passing cars and insects (mostly cicada).

Table 4-4: Noise survey results and observations for Location NM4

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Teven Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmax	LAeq	LA90				
14-12-22	8:20 (Day)	80	58	41	WD: n/a WS: 0 Rain: Nil	Birds Traffic to site Trucks passing 71-80 Front end loader up incline 52 Quarry inaudible	<37	37
14-12-22	8:35 (Day)	77	56	43	WD: n/a WS: 0 Rain: Nil	Birds Traffic to site Trucks passing 60-75 Reversing beeper 46 Quarry inaudible	<37	37
13-12-22	20:07 (Evening)	79	59	49	WD: n/a WS: 0 Rain: Nil	Insects (mostly cicada) 48-59 Quarry inaudible	<35	35
13-12-22	20:23 (Evening)	89	55	47	WD: n/a WS: 0 Rain: Nil	Insects (mostly cicada) 48-56 Aircraft 53-55 Car passing 65 Sneeze 88 Quarry inaudible	<35	35

4.5 Location NM5

Noise monitoring at location NM5 conducted on Tuesday 13 December 2022 and Wednesday 14 December 2022 resulted in inaudible quarry noise during both the day and evening periods. These results meet the established noise criteria and indicate that noise emissions from Teven Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location NM5 are presented in Table 4-5.

Noise sources measured included birds, frogs, insects, aircraft, passing trucks and the nearby Boral quarry to the east of the quarry.

Table 4-5: Noise survey results and observations for Location NM5

Date	Time (hrs)	Descriptor (dBA)			Meteorology	Description and SPL, dBA	Teven Quarry LAeq(15min) Contribution	LAeq(15min) Criteria
		LAmax	LAeq	LA90				
14-12-22	7:43 (Day)	75	44	38	WD: n/a WS: 0 Rain: Nil	Insects Birds Frogs Truck pass 40 Boral quarry nearby audible Quarry inaudible	<37	37
14-12-22	7:59 (Day)	73	44	36	WD: n/a WS: 0 Rain: Nil	Insects Birds Frogs Truck pass 40 Boral quarry nearby audible Quarry inaudible	<37	37
13-12-22	19:31 (Evening)	68	41	35	WD: 270° WS: 1.3 m/s Rain: Nil	Birds 39-44 Insects 36-41 Quarry inaudible	<35	35
13-12-22	19:46 (Evening)	59	46	40	WD: 270° WS: 0.5 m/s Rain: Nil	Aircraft 39-45 Birds 40-49 Insects 38-41 Cicada 40-49 Quarry inaudible	<35	35

5. CONCLUSION

Monitoring was carried out on Tuesday 13 December and Wednesday 14 December 2022 at five locations selected as representative to the sensitive receptors at the surroundings to Teven Quarry.

This NMA completed by Ramboll at the Holcim Teven Quarry, Teven, NSW as a quarterly requirement of the NMP showed compliance to the relevant noise criteria.

6. REFERENCES

Holcim Australia (2021) *Teven Quarry, Noise Management Plan*.

Minister for Planning and Environment (2015) 'Development Consent SSD_6422, Teven Quarry Project'.

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