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QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 1 2023 DUNLOE SANDS QUARRY, POTTSVILLE, NSW

**QUARTERLY NOISE MONITORING ASSESSMENT –
QUARTER 1 2023
DUNLOE SANDS QUARRY, POTTSVILLE, NSW**

Project name **Quarterly Noise Monitoring Assessment for Dunloe Sands Quarry – Quarter 1 2023**
Project no. **318000911**
Recipient **Matt Kelly**
Document type **Report**
Version **1**
Date **11/04/2023**
Prepared by **Matilda Englert, Jake Bourke**
Checked by **Greer Laing**
Approved by **Greer Laing**
Description **Data collected on 11 January 2023 for Dunloe Quarry during Quarter 1 2023 at Pottsville, NSW, as part of the routine noise monitoring program**

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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).
LAmix	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 Dunloe Sands Quarry (“the quarry”) at Pottsville, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Dunloe Sand Quarry Noise Management Plan (NMP) (GHD, 2020).
- Environment Protection Licence (EPL) number 13077 (NSW EPA, 2020).
- Notice of Modification (Draft) (NSW EPA, 2018).
- 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 Environmental Protection License (EPL).

1.2 Site Location and Sensitive Receptors

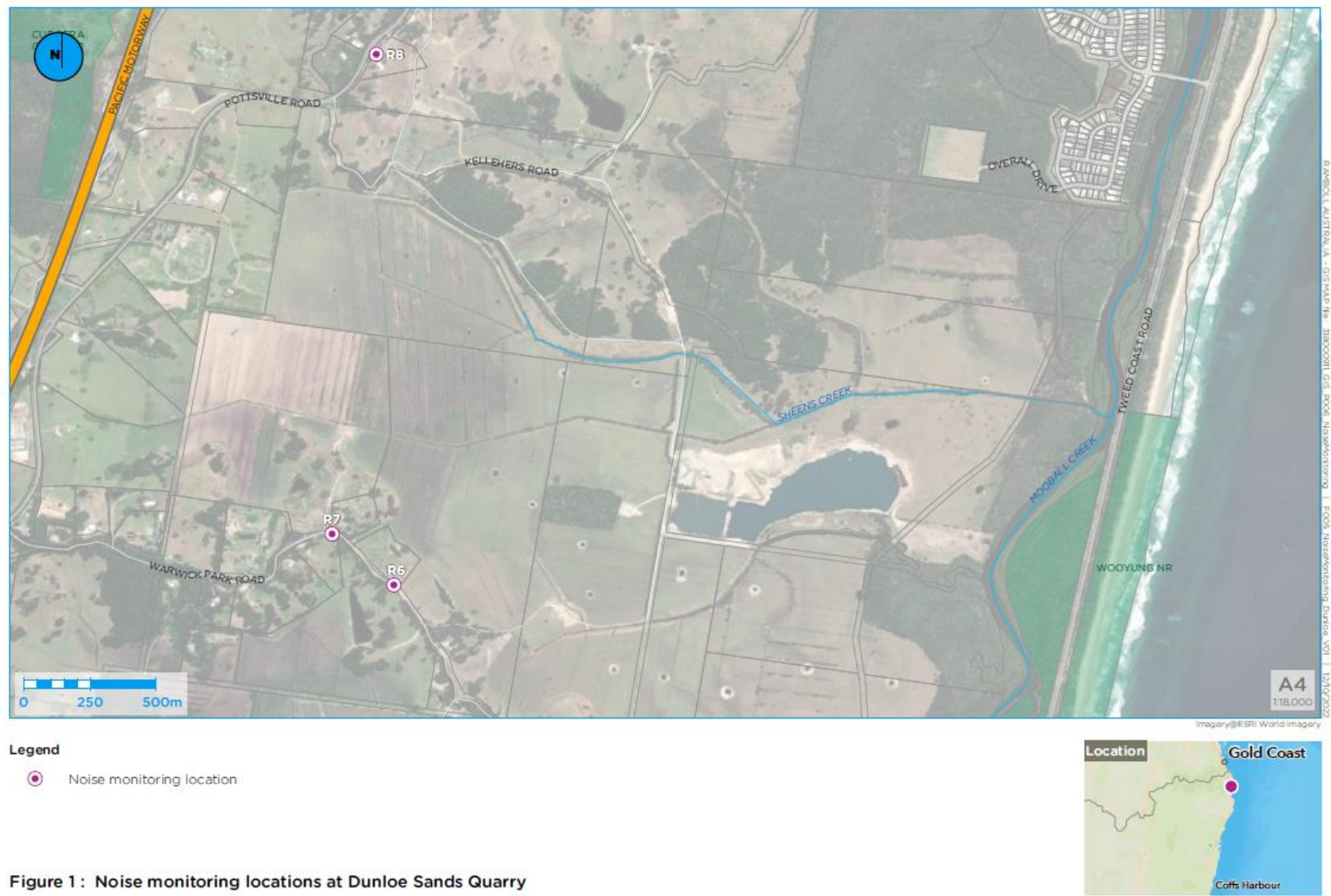
The quarry is approximately 2.5 km south of Pottsville, NSW, a town in the Northern Rivers region in Tweed Shire. Sensitive receptors surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography.

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

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Locality and Sensitive Receptors
R6	West of the quarry situated at a rural residential property at 157 Warwick Park Road.
R7	West of the quarry situated at a rural residential property at 129 Warwick Park Road.
R8	Northwest of the quarry situated at a rural residential property at 679 Pottsville Road.

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



2. NOISE CRITERIA

Table 2-1 summarises the applicable noise criteria outlined in the NMP for residential receivers (R6, R7 and R8) surrounding the quarry. The noise criteria apply when the site is operational within the permitted operating hours Monday to Friday 7am - 5pm, Saturday 7am - 12pm with no operations on Sunday.

Compliance with the noise criteria below would also determine compliance with the noise limits outlined in the sites EPL (EPL 13077) which requires that the quarry's noise contribution will not exceed 48 dB LAeq(15min) at any of the residential receivers.

Table 2-1: Monitoring locations and noise criteria

Receiver	Monitoring Locations	Day ¹
		LAeq (15min)
		dB(A)
157 Warwick Park Road	R6	42
129 Warwick Park Road	R7	48
679 Pottsville Road	R8	41
¹ 7 am–6 pm Monday to Saturday Note: no operations on Sundays 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 completed using a RION Sound Level Meter NL-52 on Wednesday 11 January 2023. The acoustic instrumentation used carried a current NATA calibration and that complied 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 ± 0.3 dBA.

Attended noise monitoring was conducted for 15-minutes at each location during the day period over one day. Where possible, throughout each measurement the operator(s) quantified the contribution of each significant noise source.

Where the quarry was not distinctly audible during the attended monitoring, the quarry contribution was estimated to be at least 10 dBA below the ambient noise level, as determined by the LA90.

4. RESULTS AND DISCUSSION

4.1 Location R6

Noise monitoring at location R6 was completed on Wednesday 11 January 2023. The quarry was inaudible during the monitoring period. These results meet the noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance during the monitoring period. The results and observations taken during the monitoring event at Location R6 are presented in Table 4-1. Noise sources measured included aircraft, wind, birds and passing vehicles.

Table 4-1: Noise survey results and observations for Location R6

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAm _{ax}	LA _{eq}	LA ₉₀				
11-01-2023	3:14 (Day)	77.3	55.4	45.9	WD: 315° WS: 1.3 m/s Rain: Nil	Aircraft 74 Truck 77 Cars 50-66 Wind 47-57 Bird 46 Quarry inaudible	Inaudible	42

4.2 Location R7

Noise monitoring at location R7 was completed on Wednesday 11 January 2023. The quarry was not audible. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R7 are presented in Table 4-2. Noise sources measured included wind, passing vehicles, insects and barking dogs.

Table 4-2: Noise survey results and observations for Location R7

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAm _{ax}	LA _{eq}	LA ₉₀				
11-01-2023	2:55 (Day)	82.8	61.5	53.6	WD: 315° WS: 1.9 m/s Rain: Nil	Passing vehicles 53-83 Wind 49-51 Insects 62-67 Barking dog 66 Quarry inaudible	Inaudible	48

4.3 Location R8

Noise monitoring at location R8 conducted on Wednesday 11 January 2023 resulted in inaudible quarry noise during the day. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R8 are presented in Table 4-3. Noise sources measured included wind and passing cars on Pottsville Road.

Table 4-3: Noise survey results and observations for Location R8

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmx	LAeq	LA90				
11-01-2023	2:26 (Day)	81.0	62.6	52.9	WD: 315° WS: 3.4 m/s Rain: Nil	Wind 52-62 Passing cars 58-75 Quarry inaudible	Inaudible	41

5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Dunloe Sands Quarry, Pottsville, NSW as a quarterly requirement of the NMP showed compliance to the relevant noise criteria. Monitoring was carried out on Wednesday 11 January 2023 at three locations selected as representative to the sensitive receptors at the surroundings to Dunloe Sands Quarry. No audible quarry noise was recorded at any of the selected monitoring locations.

6. REFERENCES

GHD (2020). Dunloe Sand Quarry Noise Management Plan.

NSW EPA (2018). Notice of Modification (Draft).

NSW EPA (2020). Environment Protection Licence number 13077.

NSW EPA (2013) *Noise Guide for Local Government*. Sydney NSW: NSW Environment Protection Authority. Available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20130127nlg.pdf> (Accessed: 25 October 2022).

NSW EPA (2017) *Noise Policy for Industry (NPfI)*. Sydney NSW: NSW Environment Protection Authority. Available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf> (Accessed: 25 October 2022).

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: 19 January 2023).

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

Intended for
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Report

Date
July 2023

Project number
318000911

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 2 2023 DUNLOE SANDS QUARRY, POTTSVILLE, NSW

**QUARTERLY NOISE MONITORING ASSESSMENT –
QUARTER 2 2023
DUNLOE SANDS QUARRY, POTTSVILLE, NSW**

Project name	Quarterly Noise Monitoring Assessment for Dunloe Sands Quarry – Quarter 1 2023	Ramboll Level 2, Suite 18 Eastpoint 50 Glebe Road PO Box 435 The Junction NSW 2291 Australia
Project no.	318000911	
Recipient	Matt Kelly	
Document type	Report	
Version	1	
Date	25/07/2023	
Prepared by	Jake Bourke	
Checked by	Andrew Bell, Rachel Condon	T +61 2 4962 5444 https://ramboll.com
Approved by	Belinda Sinclair	
Description	Data collected on 14 June 2023 for Dunloe Quarry during Quarter 2 2023 at Pottsville, NSW, as part of the routine noise monitoring program	

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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).
LAm_{ax}	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 Dunloe Sands Quarry (“the quarry”) at Pottsville, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPI) (NSW EPA, 2017).
- Dunloe Sand Quarry Noise Management Plan (NMP) (GHD, 2020).
- Environment Protection Licence (EPL) number 13077 (NSW EPA, 2020).
- Notice of Modification (Draft) (NSW EPA, 2018).
- 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 April to June 2023, and forms part of the monitoring program to determine compliance with conditions of the Environmental Protection License (EPL).

1.2 Site Location and Sensitive Receptors

The quarry is approximately 2.5 km south of Pottsville, NSW, a town in the Northern Rivers region in Tweed Shire. Sensitive receptors surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography.

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

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Locality and Sensitive Receptors
R6	West of the quarry situated at a rural residential property at 157 Warwick Park Road.
R7	West of the quarry situated at a rural residential property at 129 Warwick Park Road.
R8	Northwest of the quarry situated at a rural residential property at 679 Pottsville Road.

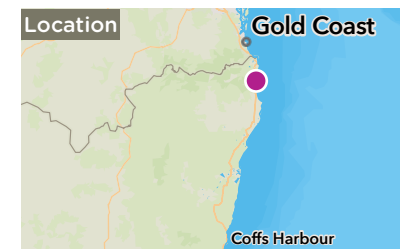
The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**.



Legend

-  Noise monitoring location

Figure 1: Noise monitoring locations at Dunloe Sands Quarry



2. NOISE CRITERIA

Table 2-1 summarises the applicable noise criteria outlined in the NMP for residential receivers (R6, R7 and R8) surrounding the quarry. The noise criteria apply when the site is operational within the permitted operating hours Monday to Friday 7am - 5pm, Saturday 7am - 12pm with no operations on Sunday.

Compliance with the noise criteria below would also determine compliance with the noise limits outlined in the sites EPL (EPL 13077) which requires that the quarry's noise contribution will not exceed 48 dB LAeq(15min) at any of the residential receivers.

Table 2-1: Monitoring locations and noise criteria

Receiver	Monitoring Locations	Day ¹
		LAeq (15min)
		dB(A)
157 Warwick Park Road	R6	42
129 Warwick Park Road	R7	48
679 Pottsville Road	R8	41
¹ 7 am–6 pm Monday to Saturday		
Note: no operations on Sundays 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 completed using a RION Sound Level Meter NL-52 on Wednesday 14 June 2023. The acoustic instrumentation used carried a current NATA calibration and that complied 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 ± 0.3 dBA.

Attended noise monitoring was conducted for 15-minutes at each location during the day period over one day. Where possible, throughout each measurement the operator(s) quantified the contribution of each significant noise source.

Where the quarry was not distinctly audible during the attended monitoring, the quarry contribution was estimated to be at least 10 dBA below the ambient noise level, as determined by the LA90.

4. RESULTS AND DISCUSSION

4.1 Location R6

Noise monitoring at location R6 was completed on Wednesday 14 June 2023. The quarry was inaudible during the monitoring period, and the ambient noise environment was dominated by aircraft, passing cars, water pump from a property and distance road noise. These results meet the noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance during the monitoring period. The results and observations taken during the monitoring event at Location R6 are presented in **Table 4-1**.

Table 4-1: Noise survey results and observations for Location R6

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmix	LAeq	LA90				
14-06-2023	9:01am to 9:16am (Day)	71.1	51.0	48.4	WD: n/a WS: 0 m/s Rain: Nil	Aircraft 51 Passing cars 57-68 Distant road traffic hum 50-51 Water pump from property 48 Quarry inaudible	<38	42

4.2 Location R7

Noise monitoring at location R7 was completed on Wednesday 14 June 2023. The quarry was inaudible during the monitoring periods, and the ambient environment was dominated by birds, horses, passing cars and distant road noise. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R7 are presented in **Table 4-2**.

Table 4-2: Noise survey results and observations for Location R7

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmix	LAeq	LA90				
14-06-2023	8:39am to 8:54am (Day)	76.7	53.5	45.4	WD: n/a WS: 0 m/s Rain: Nil	Passing cars 65-75 Birds 50-55 Horses 48-49 Distant road traffic hum 48-56 Quarry inaudible	<35	48

4.3 Location R8

Noise monitoring at location R8 conducted on Wednesday 14 June 2023. The quarry was inaudible during the monitoring periods, and the ambient environment was dominated by passing cars on Pottsville Road. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R8 are presented in **Table 4-3**.

Table 4-3: Noise survey results and observations for Location R8

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and LAeq (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAm _{ax}	LA _{eq}	LA ₉₀				
14-06-2023	9:22am to 9:37am (Day)	82.8	61.1	35.4	WD: n/a WS: 0 m/s Rain: Nil	Passing cars 58-80 Quarry inaudible	<25	41

5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Dunloe Sands Quarry, Pottsville, NSW as a quarterly requirement of the NMP showed compliance to the relevant noise criteria. Monitoring was carried out on Wednesday 14 June 2023 at three locations selected as representative to the sensitive receptors at the surroundings to Dunloe Sands Quarry. No audible quarry noise was recorded at any of the selected monitoring locations.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Dunloe Sands Quarry, Pottsville, NSW.

6. REFERENCES

GHD (2020). Dunloe Sand Quarry Noise Management Plan.

NSW EPA (2018). Notice of Modification (Draft).

NSW EPA (2020). Environment Protection Licence number 13077.

NSW EPA (2013) *Noise Guide for Local Government*. Sydney NSW: NSW Environment Protection Authority. Available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20130127nlg.pdf> (Accessed: 25 October 2022).

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

Intended for
Holcim (Australia) Pty Ltd

Document type
Report

Date
October 2023

Project number
318001799

QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 3 2023 DUNLOE SANDS QUARRY, POTTSVILLE, NSW

**QUARTERLY NOISE MONITORING ASSESSMENT –
QUARTER 3 2023
DUNLOE SANDS QUARRY, POTTSVILLE, NSW**

Project name **Quarterly Noise Monitoring Assessment for Dunloe Sands Quarry – Quarter 3 2023**
Project no. **318001799**
Recipient **Matt Kelly**
Document type **Report**
Version **1**
Date **26/10/2023**
Prepared by **Jake Bourke, Matilda Englert**
Checked by **Arnold Cho, Rachel Condon**
Approved by **Belinda Sinclair**
Description **Data collected on 11 July 2023 for Dunloe Quarry during Quarter 3 2023 at Pottsville, NSW, as part of the routine noise monitoring program**

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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).
LAmaz	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
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.

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 Dunloe Sands Quarry (“the quarry”) at Pottsville, NSW.

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- Dunloe Sand Quarry Noise Management Plan (NMP) (GHD, 2020).
- Environment Protection Licence (EPL) number 13077 (NSW EPA, 2020).
- Development Consent No. 06_0030, MOD2 (NSW EPA, 2018)
- 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 July to September 2023, and forms part of the monitoring program to determine compliance with conditions of the Environmental Protection License (EPL).

1.2 Site Location and Sensitive Receptors

The quarry is approximately 2.5 km south of Pottsville, NSW, a town in the Northern Rivers region in Tweed Shire. Sensitive receptors surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography.

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

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Locality and Sensitive Receptors
R6	West of the quarry situated at a rural residential property at 157 Warwick Park Road.
R7	West of the quarry situated at a rural residential property at 129 Warwick Park Road.
R8	Northwest of the quarry situated at a rural residential property at 679 Pottsville Road.

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



Figure 1: Noise monitoring locations at Dunloe Sands Quarry

2. NOISE CRITERIA

Table 2-1 summarises the applicable noise criteria outlined in the NMP for residential receivers (R6, R7 and R8) surrounding the quarry. The noise criteria apply when the site is operational within the permitted operating hours Monday to Friday 7am - 5pm, Saturday 7am - 12pm with no operations on Sunday.

Compliance with the noise criteria below would also determine compliance with the noise limits outlined in the sites EPL (EPL 13077) which requires that the quarry's noise contribution will not exceed 48 dB LAeq(15min) at any of the residential receivers.

Table 2-1: Monitoring locations and noise criteria

Receiver	Monitoring Locations	Day ¹
		LAeq (15min)
		dB(A)
157 Warwick Park Road	R6	42
129 Warwick Park Road	R7	48
679 Pottsville Road	R8	41
¹ 7 am–6 pm Monday to Saturday		
Note: no operations on Sundays 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 completed using a RION Sound Level Meter NL-52 on Tuesday 11 July 2023. The acoustic instrumentation used carried a current NATA calibration and that complied 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 ± 0.3 dBA.

Attended noise monitoring was conducted for 15-minutes at each location during the day period over one day. Where possible, throughout each measurement the operator(s) quantified the contribution of each significant noise source.

Where the quarry was not distinctly audible during the attended monitoring, the quarry contribution was estimated to be at least 10 dBA below the ambient noise level, as determined by the LA90.

4. RESULTS AND DISCUSSION

4.1 Location R6

Noise monitoring at location R6 was completed on Tuesday 11 July 2023. The quarry was audible during the monitoring period, with a bulldozer heard from the quarry, although quarry contribution was still estimated to be below criteria. The ambient noise environment was dominated by aircraft and birds. These results meet the noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance during the monitoring period. The results and observations taken during the monitoring event at Location R6 are presented in **Table 4-1**.

Table 4-1: Noise survey results and observations for Location R6

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmix	LAeq	LA90				
11-07-2023	12:59pm to 1:14pm (Day)	55.7	37.5	28.8	WD: n/a WS: 0 m/s Rain: Nil	Birds 30-45 Aircraft 30-36 Bulldozer from site 27-30 Site audible	<19	42

4.2 Location R7

Noise monitoring at location R7 was completed on Tuesday 11 July 2023. The quarry was inaudible during the monitoring periods, and the ambient environment was dominated by birds and wind. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R7 are presented in **Table 4-2**.

Table 4-2: Noise survey results and observations for Location R7

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmix	LAeq	LA90				
11-07-2023	12:47pm to 1:02pm (Day)	60.7	41.8	35.8	WD: 347° WS: 3.1 m/s Rain: Nil	Background wind noise 37-41 Birds 41-44 Quarry inaudible	<26	48

4.3 Location R8

Noise monitoring at location R8 conducted on Tuesday 11 July 2023. The quarry was inaudible during the monitoring periods, and the ambient environment was dominated by passing cars on Pottsville Road, wind, and birds. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R8 are presented in **Table 4-3**.

Table 4-3: Noise survey results and observations for Location R8

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAm _{ax}	LA _{eq}	LA ₉₀				
11-07-2023	1:21pm to 1:34pm (Day)	87.4	63.3	37.4	WD: 344° WS: 2.0 m/s Rain: Nil	Background passing cars 50-87 Background wind 37-38 Birds 38-41 Quarry inaudible	<27	41

5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Dunloe Sands Quarry, Pottsville, NSW as a quarterly requirement of the NMP showed compliance to the relevant noise criteria. Monitoring was carried out on Tuesday 11 July 2023 at three locations selected as representative to the sensitive receptors at the surroundings to Dunloe Sands Quarry. Audible quarry noise was recorded at one of the selected monitoring locations but did not exceed the criteria.

The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Dunloe Sands Quarry, Pottsville, NSW.

6. REFERENCES

GHD (2020). Dunloe Sand Quarry Noise Management Plan.

NSW EPA (2018). Development Consent No. 06_0030, MOD2 (November 2018)

NSW EPA (2020). Environment Protection Licence number 13077.

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NSW EPA (2017) *Noise Policy for Industry (NPfI)*. Sydney NSW: NSW Environment Protection Authority. Available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf> (Accessed: 25 October 2022).

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QUARTERLY NOISE MONITORING ASSESSMENT – QUARTER 4 2023 DUNLOE SANDS QUARRY, POTTSVILLE, NSW

**QUARTERLY NOISE MONITORING ASSESSMENT –
QUARTER 4 2023
DUNLOE SANDS QUARRY, POTTSVILLE, 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).
LAmaz	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
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.

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 Dunloe Sands Quarry (“the quarry”) at Pottsville, NSW.

This NMA was done in accordance with the following documents:

- Noise Policy for Industry (NPfI) (NSW EPA, 2017).
- Dunloe Sand Quarry Noise Management Plan (NMP) (GHD, 2020).
- Environment Protection Licence (EPL) number 13077 (NSW EPA, 2020).
- Development Consent No. 06_0030, MOD2 (NSW EPA, 2018)
- 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 October to December 2023, and forms part of the monitoring program to determine compliance with conditions of the Environmental Protection License (EPL).

1.2 Site Location and Sensitive Receptors

The quarry is approximately 2.5 km south of Pottsville, NSW, a town in the Northern Rivers region in Tweed Shire. Sensitive receptors surrounding the quarry are primarily rural and residential properties in coastal bushland with elevated and undulating topography.

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

Table 1-1: Monitoring locations locality and sensitive receptors

Monitoring Locations	Locality and Sensitive Receptors
R6	West of the quarry situated at a rural residential property at 157 Warwick Park Road.
R7	West of the quarry situated at a rural residential property at 129 Warwick Park Road.
R8	Northwest of the quarry situated at a rural residential property at 679 Pottsville Road.

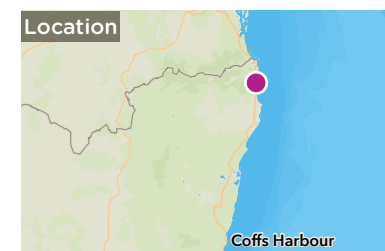
The monitoring locations with respect to the quarry and assessed receivers are presented in the locality plan shown in **Figure 1**. It should be noted that while the NMP states monitoring locations be measured from the most affected points within surrounding residential property boundaries or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary, this has not been possible for this NMA due to access restrictions. Monitoring was completed at the property boundary of each location where accessible and in each case the property dwelling was approximately 40 to 100 metres from the boundary. This would have resulted in a conservative assessment as the monitoring locations were closer to the site.



Legend

- Noise monitoring location
- Property dwelling

Figure 1: Noise monitoring locations at Dunloe Sands Quarry



2. NOISE CRITERIA

Table 2-1 summarises the applicable noise criteria outlined in the NMP for residential receivers (R6, R7 and R8) surrounding the quarry. The noise criteria apply when the site is operational within the permitted operating hours Monday to Friday 7am - 5pm, Saturday 7am - 12pm with no operations on Sunday.

Compliance with the noise criteria below would also determine compliance with the noise limits outlined in the sites EPL (EPL 13077) which requires that the quarry's noise contribution will not exceed 48 dB LAeq(15min) at any of the residential receivers.

Table 2-1: Monitoring locations and noise criteria

Receiver	Monitoring Locations	Day ¹
		LAeq (15min)
		dB(A)
157 Warwick Park Road	R6	42
129 Warwick Park Road	R7	42
679 Pottsville Road	R8	48
All other residences		41
¹ 7 am–6 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 measurements were completed using a RION Sound Level Meter NL-52 on Wednesday 11 October 2023. The acoustic instrumentation used carried a current NATA calibration and that complied 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 ± 0.3 dBA.

Each attended noise measurement was conducted for 15-minutes in duration at each monitoring location during the day period over one day. Where possible, throughout each measurement the operator(s) quantified the contribution of each significant noise source.

Where the quarry was not distinctly audible during the attended monitoring, the quarry contribution was estimated to be at least 10 dBA below the ambient noise level, as determined by the LA90.

4. RESULTS AND DISCUSSION

4.1 Location R6

Noise monitoring at location R6 was completed on Wednesday 11 October 2023. The quarry was inaudible during the monitoring periods, and the ambient environment was dominated by wind, trees, birds, and an aircraft. These results meet the noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance during the monitoring period. The results and observations taken during the monitoring event at Location R6 are presented in **Table 4-1**.

Table 4-1: Noise survey results and observations for Location R6

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmix	LAeq	LA90				
11-10-2023	10:02am to 10:17am (Day)	58.6	38.9	35.4	WD: 20° WS: 3.6 m/s Rain: Nil	Background wind/trees/birds 32-41 Aircraft 38-58 (occurred once for 11 seconds) Quarry inaudible	<25	42

4.2 Location R7

Noise monitoring at location R7 was completed on Wednesday 11 October 2023. The quarry was inaudible during the monitoring periods, and the ambient environment was dominated by motorway hum, wind, trees, birds, and an aircraft. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R7 are presented in **Table 4-2**.

Table 4-2: Noise survey results and observations for Location R7

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAmix	LAeq	LA90				
11-10-2023	10:19am to 10:36am (Day)	72.1	46.0	36.9	WD: 20° WS: 3.8 m/s Rain: Nil	Background motorway/wind/trees/birds 34-58 Aircraft 45-72 (occurred once for 14 seconds) Quarry inaudible	<27	42

4.3 Location R8

Noise monitoring at location R8 conducted on Wednesday 11 October 2023. The quarry was inaudible during the monitoring periods, and the ambient environment was dominated by passing cars on Pottsville Road, insects, birds, and an aircraft. These results meet the established noise criteria and indicate that noise emissions from Dunloe Sands Quarry did not contribute to noise nuisance. The results and observations taken during the monitoring events at Location R8 are presented in **Table 4-3**.

Table 4-3: Noise survey results and observations for Location R8

Date	Time	Descriptor (dBA)			Meteorology	Apparent Noise Source, Description and SPL (dBA)	Dunloe Quarry LAeq(15min) Contribution (dBA)	LAeq(15min) Criteria (dBA)
		LAm _{ax}	LA _{eq}	LA ₉₀				
11-10-2023	10:42am to 10:57am (Day)	73.5	57.2	35.5	WD: - WS: - Rain: -	Background insects 35-36 Passing cars (occurred 11 times for ~14 seconds each time) Birds 34-36 Aircraft 34-44 (occurred once for 10 seconds) Quarry inaudible	<26	48

5. CONCLUSION

This NMA was completed by Ramboll at the Holcim Dunloe Sands Quarry, Pottsville, NSW as a quarterly requirement of the NMP showed compliance with the relevant noise criteria. Monitoring was carried out on Wednesday 11 October 2023 at three locations selected as representative to the sensitive receptors at the surroundings to Dunloe Sands Quarry. No audible quarry noise was recorded at any of the selected monitoring locations.

As monitoring was completed at the property boundary of each location and each property dwelling was approximately 40 to 100 metres from the boundary, it is recommended that permission from the property owners be sought to access their property to complete future noise monitoring within 30 metres of the property dwellings. The results presented in this NMA show compliance with the relevant noise criteria at the Holcim Dunloe Sands Quarry, Pottsville, NSW.

6. REFERENCES

GHD (2020). Dunloe Sand Quarry Noise Management Plan.

NSW EPA (2018). Development Consent No. 06_0030, MOD2 (November 2018)

NSW EPA (2020). Environment Protection Licence number 13077.

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NSW EPA (2017) *Noise Policy for Industry (NPfI)*. Sydney NSW: NSW Environment Protection Authority. Available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/17p0524-noise-policy-for-industry.pdf> (Accessed: 25 October 2022).

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: 19 January 2023).

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