

## CALGA SAND QUARRY

LOT 151 PEATS RIDGE ROAD, CALGA, NSW, 2250

COMPLIANCE NOISE MONITORING (2022 Q1)

RWDI # 2200854.03

March 29, 2022

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## DOCUMENT CONTROL

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## GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

**Maximum Noise Level (L<sub>Amax</sub>)** – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

**L<sub>A1</sub>** – The L<sub>A1</sub> level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L<sub>A1</sub> level for 99% of the time.

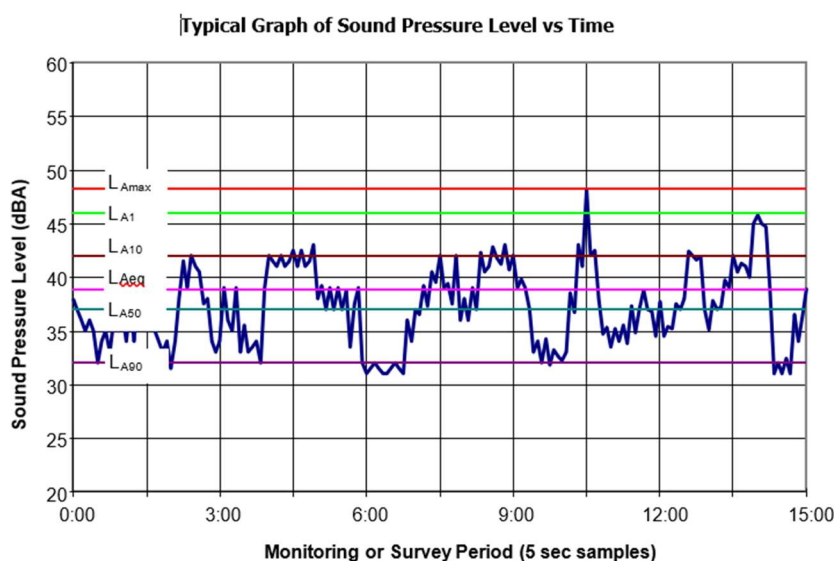
**L<sub>A10</sub>** – The L<sub>A10</sub> level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L<sub>A10</sub> level for 90% of the time. The L<sub>A10</sub> is a common noise descriptor for environmental noise and road traffic noise.

**L<sub>A90</sub>** – The L<sub>A90</sub> level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L<sub>A90</sub> level for 10% of the time. This measure is commonly referred to as the background noise level.

**L<sub>Aeq</sub>** – The equivalent continuous sound level (L<sub>Aeq</sub>) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

**ABL** – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L<sub>A90</sub>) for each period.

**RBL** – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.





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# 1 INTRODUCTION

RWDI Australia (RWDI) was commissioned by Hanson Construction Pty Ltd to conduct the quarterly compliance noise monitoring of the Calga Sand Quarry located at Lot 151, Peats Ridge Road in Calga (the Site).

This report summarises the results of the quarterly attended noise monitoring conducted on 21 March 2022 and assess them against the operational noise criteria set in Development Consent DA 94-4-2004.

The Noise Monitoring Program prepared by R.W. Corkery & Co. Pty Ltd summarises all relevant criteria, monitoring locations, and frequency / timing of monitoring.

## 2 OPERATIONAL NOISE CRITERIA

**Table 2-1** summarises the daytime operational noise criteria as summarised in Condition 2, Schedule 3, of Development Consent DA 94-4-2004 (as consolidated). Noise levels emanating from the Site must not exceed the relevant criteria when measured within 30 metres (m) of the dwelling.

**Table 2-1 Operational Daytime Noise Criteria**

| Assessment Location | Daytime $L_{Aeq,15min}$ Operational Noise Criteria (dBA) |
|---------------------|--|
| CN-1                | 41   |
| CN-2                | 40   |
| CN-3                | 39   |
| CN-6                | 36   |

The relevant assessment locations are shown in **Figure 2-1**.



**Figure 2-1 Site Locality and Assessment Locations**



## 3 MONITORING METHODOLOGY

Attended noise monitoring was conducted during the daytime assessment period (7:00 am – 6:00 pm) on Monday, 21 March 2022. One 15-minute measurement was conducted at each of the receiver locations listed in **Table 2-1**.

### 3.1 Monitoring Locations

Monitoring was conducted at the four assessment locations listed in **Table 2-1** and shown in **Figure 2-1**. All noise measurements were conducted at a location representative of the most affected point within the 30 m perimeter surrounding the dwelling.

### 3.2 Meteorological Conditions

Based on site observations, meteorological conditions were deemed suitable for conducting environmental noise measurements during the day of survey (wind less than five metres per second [m/s] at microphone height and no rain). Wind speed was determined by the RWDI operator using a hand-held digital anemometer AR816. This was confirmed by meteorological data obtained from the Site's Automatic Weather Station (AWS) (**Table 3-1**).

**Table 3-1 Meteorological Conditions during Noise Survey (21 March 2022)**

| Time Period         | Wind Speed (m/s) | Wind Direction | Rain (mm) |
|---------------------|------------------|----------------|-----------|
| 10:30 am – 10:45 am | 2.2              | WSW            | 0         |
| 10:45 am – 11:00 am | 2.2              | WSW            | 0         |
| 11:00 am – 11:15 am | 1.8              | SW             | 0         |
| 11:15 am – 11:30 am | 2.2              | SW             | 0         |
| 11:30 am – 11:45 am | 1.8              | SSW            | 0         |
| 11:45 am – 12:00 pm | 1.8              | SSW            | 0         |

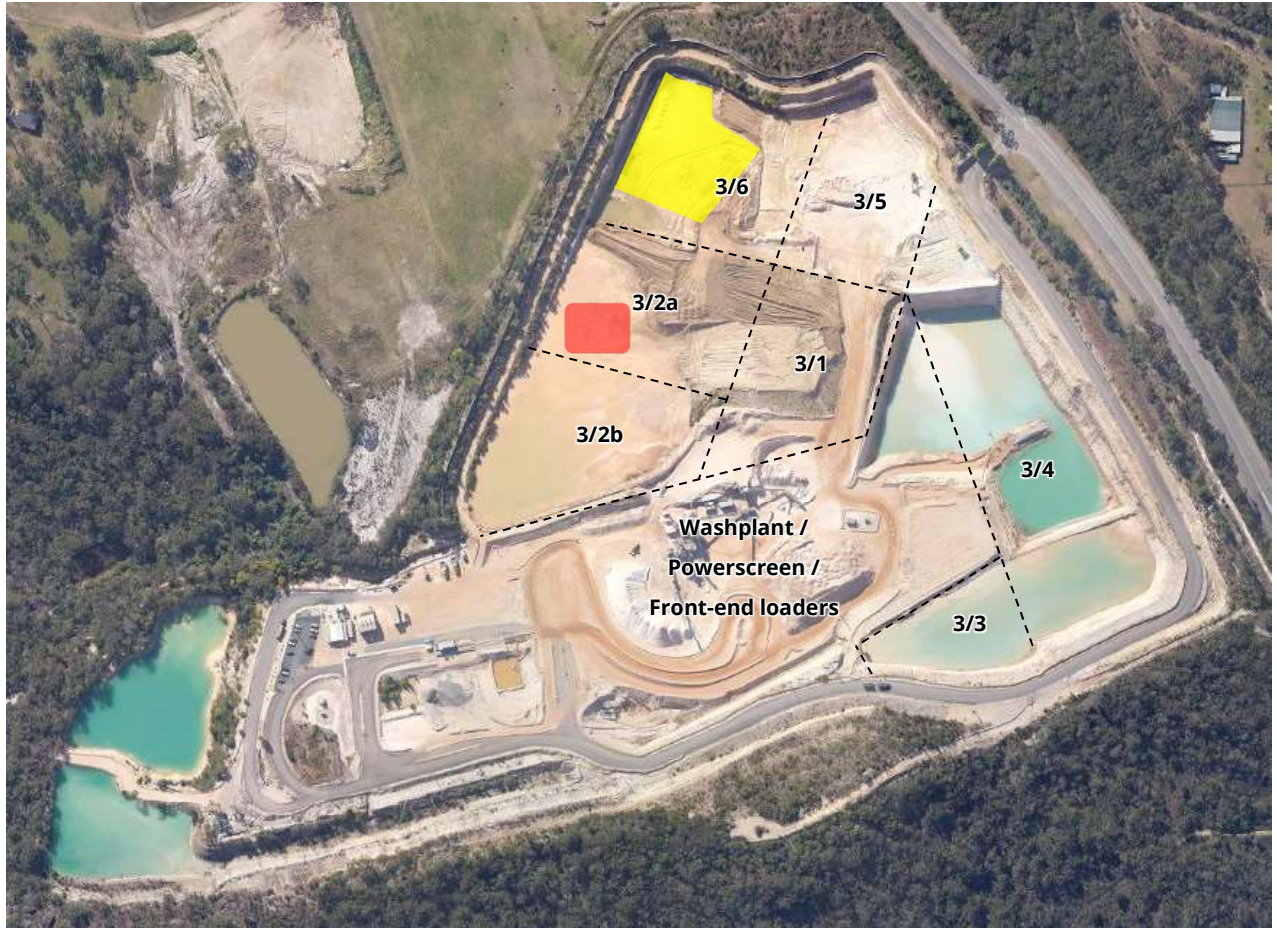
### 3.3 Monitoring Equipment

All measurements were conducted using a NTi XL2 Sound Level Meter (SLM). This sound level meter conforms to Australian Standard 1259 *Acoustics – Sound Level Meters* as a Type 1 Precision Sound Level Meter which has an accuracy suitable for field and laboratory use. The A-Weighting filter of the meter was selected and the time weighting was set to “Fast”. The calibration of the meter was checked before and after the measurements with a Brüel and Kjær Type 4230 sound level calibrator and no significant drift was noted (the sound level meter calibrated 94.0 dBA before and after each of the 15-minute measurements).

The NTi XL2 sound level meter and the Brüel and Kjær Type 4230 have been laboratory calibrated within the previous two years in accordance with our in-house Quality Assurance Procedures. The Calibration Certificate for the SLM used for the monitoring is attached to this letter. Note that Calibration Certificates are valid for 2 years.

## 4 DESCRIPTION OF SITE OPERATIONS

**Figure 4-1** shows the site layout with the active work locations on the day of the survey.



**Figure 4-1 Site Layout and Active Work Locations (21 March 2022)**

The following mobile plant and equipment were in operation during the time of the monitoring:

- Excavator loading haul trucks with raw feed from Stage 3/6 to wash plant surge pile (within yellow area shown in **Figure 4-1**).
- One haul truck transferring raw feed from Stage 3/6 to the wash plant surge pile.
- Front-end loader loading sales trucks and loading dump truck with oversize material to be taken to the oversize material stockpile (within red area shown in **Figure 4-1**).
- Water truck operational on all unsealed roadways.
- Front-end loader loading dry screening plant (Powerscreen)
- Dozer pushing and track rolling oversize material on the southern side of the Powerscreen
- Washplant running in pre/screening mode (i.e. half the plant running) and dry screening plant (Powerscreen)



## 5 ASSESSMENT OF NOISE LEVELS

**Table 5-1** summarises the measurement results and compares them against the relevant daytime noise criteria (**Table 2-1**).

**Table 5-1 Attended Noise Measurement Results (21 March 2022)**

| Assessment Location | Start Time | L <sub>Aeq,15min</sub> due to Site Noise (dBA) | Operational Noise Criteria (dBA) | Comments  |
|---------------------|------------|--|----------------------------------|---|
| CN-1                | 10:35 am   | 41   | 41                               | <b>Site-related sources:</b><br>Site audible during lulls of traffic and of almost constant nature – mobile fleet ~ 35-43 dBA.<br><b>Other dominant noise sources:</b><br>Frequent Peats Ridge Road traffic ~ 48-60 dBA .<br>Frequent birds ~ 40-60 dBA.  |
| CN-3                | 10:52 am   | 30   | 39                               | <b>Site-related sources:</b><br>Site audible during lulls of traffic and of almost constant nature – mobile fleet ~ 28-33 dBA.<br><b>Other dominant noise sources:</b><br>Frequent Peats Ridge Road traffic ~ 50-74 dBA.<br>Frequent birds ~ 39-50 dBA.   |
| CN-2                | 11:12 am   | 31   | 40                               | <b>Site-related sources:</b><br>Site audible during lulls of traffic and of almost constant nature – mobile fleet ~ 28-35 dBA.<br>Occasional impact noise L <sub>Amax</sub> ~ 36-39 dBA.<br><b>Other dominant noise sources:</b><br>Frequent Peats Ridge Road traffic ~ 55-76 dBA.<br>Frequent birds ~ 42-54 dBA. |
| CN-6                | 11:33 am   | Inaudible                                      | 36                               | <b>Site-related sources:</b><br>Site inaudible at all times.<br><b>Other dominant noise sources:</b><br>Frequent road traffic on Peats Ridge Road dominating the noise environment ~ 51-67 dBA<br>Frequent birds ~ 45-49 dBA  |

**Table 5-1** indicates that measured L<sub>Aeq,15min</sub> noise levels due to quarry operations comply with the relevant daytime noise criteria at all four receivers.



## 6 CONCLUSIONS

Attended compliance noise monitoring was conducted on Monday, 21 March 2022. The results of the survey indicate that noise emissions from the Calga Sand Quarry complied with the daytime operational noise criteria set in Development Consent DA 94-4-2004 at all four identified assessment locations.

## APPENDIX A: CALIBRATION CERTIFICATE



**Acoustic  
Research  
Labs Pty Ltd**

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North Rocks NSW AUSTRALIA 2151  
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119  
[www.acousticresearch.com.au](http://www.acousticresearch.com.au)

**Sound Level Meter**  
**IEC 61672-3:2013**  
**Calibration Certificate**  
Calibration Number C21674

**Client Details** RWDI  
Level 4, 272 Pacific Highway  
Crows Nest NSW 2065


**Equipment Tested/ Model Number :** Nti XL2  
**Instrument Serial Number :** A2A-08006-E0  
**Microphone Serial Number :** 7796  
**Pre-amplifier Serial Number :** 09815

**Pre-Test Atmospheric Conditions**  
**Ambient Temperature :** 20.9°C  
**Relative Humidity :** 54.9%  
**Barometric Pressure :** 100.5kPa

**Post-Test Atmospheric Conditions**  
**Ambient Temperature :** 21.8°C  
**Relative Humidity :** 53.6%  
**Barometric Pressure :** 100.5kPa

**Calibration Technician :** Lucky Jaiswal  
**Calibration Date :** 13 Oct 2021

**Secondary Check:** Harrison Kim  
**Report Issue Date :** 15 Oct 2021

**Approved Signatory :** 

Ken Williams

| Clause and Characteristic Tested                   | Result | Clause and Characteristic Tested                  | Result |
|--|--------|---|--------|
| 12: Acoustical Sig. tests of a frequency weighting | Pass   | 17: Level linearity incl. the level range control | Pass   |
| 13: Electrical Sig. tests of frequency weightings  | Pass   | 18: Toneburst response                            | Pass   |
| 14: Frequency and time weightings at 1 kHz         | Pass   | 19: C Weighted Peak Sound Level                   | Pass   |
| 15: Long Term Stability                            | Pass   | 20: Overload Indication                           | Pass   |
| 16: Level linearity on the reference level range   | Pass   | 21: High Level Stability                          | Pass   |

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

| Least Uncertainties of Measurement - |         |                          |           |
|--------------------------------------|---------|--------------------------|-----------|
| Acoustic Tests                       |         | Environmental Conditions |           |
| 125Hz                                | ±0.13dB | Temperature              | ±0.2°C    |
| 1kHz                                 | ±0.13dB | Relative Humidity        | ±2.4%     |
| 8kHz                                 | ±0.14dB | Barometric Pressure      | ±0.015kPa |
| Electrical Tests                     | ±0.10dB |                          |           |

*All uncertainties are derived at the 95% confidence level with a coverage factor of 2.*



This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.  
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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